THE PSYCHOLOGY OF
MEDITATION

RESEARCH & PRACTICE

EDITED BY

MICHAEL A. WEST

The Psychology of Meditation

Research and Practice

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Preface

In 1987 Oxford University Press published a book entitled *The Psychology of Meditation*, which reviewed research on the effects of meditation upon arousal, brain wave activity, and personality. It also described the very limited research examining the application of meditation in clinical settings. It was a privilege for me to edit that book and to learn from the content. But more than 30 years have gone by since its publication. I have continued to practice meditation but had not kept abreast with what psychological research had discovered about meditation processes and outcomes. Like many others I was curious about how our knowledge has developed.

   The motivation to edit a new book with the same focus was selfish, therefore. I wanted to learn from those who could best contribute to a volume reviewing from a psychological perspective what we know about research into and the practice of meditation. Finding the key researchers and inviting them to give of their time to write a chapter was the major challenge. I am fortunate that all of the contributors, who come from many different countries, are people who are not only deeply immersed in the challenge of understanding meditation from a psychological perspective, but who also have practiced meditation (for the most part) over many years. Not only do they review research but they also provide a personal account of their meditation experience and, in some cases, journeys. It is a privilege for me to be able to learn from their rich contributions. My selfish motivation in editing this volume has been rewarded by the outcome. My hope is that readers will find much to savor and will also have a sense of privilege in the enlightenment that I have found in reading the contents of the chapters that these generous contributors have crafted.

Sheffield, United Kingdom, April 2015

Acknowledgments

Contents

List of contributors

Martine Batchelor was born in France in 1953. She was ordained as a Buddhist nun in Korea in 1975. She studied Zen Buddhism under the guidance of the late Master Kusan at Songgwang Sa monastery until 1984. Her Zen training also took her to nunneries in Taiwan and Japan. From 1981 she served as Kusan Sunim's interpreter and accompanied him on lecture tours throughout the United States and Europe. She translated his book, *The Way of Korean Zen*. Following Master Kusan's death she returned her nun's vows and left Korea. She returned to Europe with her husband, Stephen, in 1985. She worked as a lecturer and spiritual counselor both at Gaia House and elsewhere in Britain. She was also involved in interfaith dialogue and was a Trustee of the International Sacred Literature Trust until 2000. In 1992 she published, as co-editor, *Buddhism and Ecology*. In 1996 she published, as editor, *Walking on Lotus Flowers*, which in 2001 was reissued under the title *Women on the Buddhist Path*. She is the author of *Principles of Zen, Meditation for Life* (an illustrated book on meditation), *The Path of Compassion* (a translation from the Korean version, with reference to the original Chinese, of the *Brahmajala Sutra*), *Women in Korean Zen*, and *Let Go: A Buddhist Guide to Breaking Free of Habits*. Her latest book is *The Spirit of the Buddha*. She leads meditation retreats worldwide and lives in France.

Loriliai Biernacki is Associate Professor in the Department of Religious Studies at the University of Colorado at Boulder. Her research interests include Hinduism, ethics, gender, and the interface between religion and science. Her first book, *Renowned Goddess of Desire: Women, Sex and Speech in Tantra* (Oxford 2007) won the Kayden Award in 2008. She is co-editor of *Panentheism across the World's Religious Traditions* (Oxford 2013). She is currently working on a study on the eleventh-century Indian philosopher Abhinavagupta within the framework of wonder, the new materialisms, and ideas of the body and the body–mind interface.

Frank W. Bond is the Director of the Institute of Management Studies at Goldsmiths, University of London. His research and consultancy seek to identify the processes by which acceptance and commitment therapy (ACT), leadership, and organizational interventions improve productivity and well-being in the workplace. The ESRC, UK government, charities, and industry have funded his research, and the academic publications stemming from

that research have been cited nearly 7000 times in academic papers and books. Because of the ACT randomized controlled studies he has published, the UK government, the British Olympic team, the BBC, and other private and public sector institutions have asked Professor Bond to consult with, and conduct ACT-related research in, their organizations. Professor Bond has been elected President and Fellow of the ACT-focused Association of Contextual Behavioural Science.

Sarah Bowen is an Assistant Professor at Pacific University in Portland, Oregon, and a licensed clinical psychologist. Over the past decade, her primary clinical and research interests have centered on mindfulness-based treatments for addictive behaviors. She has conducted several clinical trials examining effects of mindfulness-based interventions, as well as possible mechanisms underlying the change process, funded by the National Institute of Health. Currently, Dr. Bowen is working both locally and internationally to provide training in mindfulness-based therapies to health professionals, and to assist in the adaptation of protocols to serve diverse settings, populations, and cultures. Her research has been supported by grants from the National Institute on Mental Health, the National Institute on Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, and the National Cancer Institute.

Vidyamala Burch is an ordained member of the Triratna Buddhist Order, as well as founder and co-Director of Breathworks, an organization devoted to offering mindfulness and compassion to people suffering from pain, illness, and stress (www.breathworks-mindfulness.org.uk). Breathworks teachers now offer courses in over 20 countries. Vidyamala teaches and speaks internationally in both her Buddhist and Breathworks roles. She specializes in mindfulness and compassion retreats and workshops. In 2008 she wrote *Living Well with Pain and Illness—the mindful way to free yourself from suffering* and in 2012 she co-authored *Mindfulness for Health* with Danny Penman (published as *You are Not Your Pain* in the USA). This won first prize in the BMA book awards 2014 in the "Popular Medicine" category—clinical books aimed at the general public. She has also published a number of guided meditation CDs and DVDs. Vidyamala has been instrumental in initiating research projects that provide an evidence-base for the efficacy of the Breathworks' approach. This is guided by a board of respected academic leaders under the auspices of the Breathworks Foundation (http://www.breathworks-foundation.org.uk). Breathworks grew out of Vidyamala's personal experience of managing chronic pain following spinal injuries and surgery in her teens. She learned mindfulness and compassion meditations when she was

25 and has used these over the subsequent 30 years to create a fulfilling quality of life, despite ongoing pain and disability.

Linda E. Carlson holds the Enbridge Research Chair in Psychosocial Oncology and is Full Professor in Psychosocial Oncology in the Department of Oncology, Cumming School of Medicine at the University of Calgary. Dr. Carlson trained as a Clinical Health Psychologist at McGill University in Montreal, researching the area of psychoneuroendocrinology. Her current research focuses on developing and testing complementary therapy interventions to help people cope with cancer. Dr. Carlson received the Kawano New Investigator Award from the International Psycho-Oncology Society in 2006, the William E. Rawls Prize in cancer control from the National Cancer Institute of Canada/Canadian Cancer Society in 2007, a New Investigator Award from the Canadian Psychological Association Health Section in 2009, the inaugural Research Excellence award from the Canadian Association of Psychosocial Oncology in 2010, the Arete Award for Research Excellence from the Department of Oncology at the University of Calgary in 2012, and was shortlisted for the Dr. Rogers Prize in Complementary and Alternative Medicine in 2013. She is a fellow of the Society for Behavioral Medicine and the Mind and Life Institute. Dr. Carlson's research in mindfulness-based cancer recovery has been published in many high-impact journals and book chapters, and she published a patient manual in 2010 with Michael Speca, entitled *Mindfulness-Based Cancer Recovery: A step-by-step MBSR approach to help you cope with treatment and reclaim your life*, in addition to a professional training manual in 2009 with Shauna Shapiro entitled *The Art and Science of Mindfulness: Integrating mindfulness into psychology and the helping professions*. She has published over 150 research papers and book chapters in the area of psycho-oncology, holds several millions of dollars in grant funding, and is regularly invited to present her work at international conferences.

James Carmody studied and practiced in the Zen, Tibetan, Theravada, and Advaita traditions in a number of countries for over 40 years. He is an Associate Professor of Medicine at the University of Massachusetts Medical School and has been principal investigator on several NIH-funded clinical trials of the effects and mechanisms of mindfulness and other mind-body trainings. He has been a therapist, an instructor in the UMass Mindfulness-Based Stress Reduction program, and Director of Research for the UMass Center for Mindfulness. Instead of a dharma narrative, he places human angst in the adaptive attending processes resulting from evolutionary and

biological imperatives, and describes the psychological mechanisms by which mindfulness, and other mind-body and psychotherapeutic modalities, operate to recognize and counter these default processes to reduce distress. He also teaches courses for clinicians with the goal of making the conceptualization and practice of mindfulness and mind-body processes clear and jargon-free, so that they can be meaningfully introduced in the context of a typically brief patient visit and be practicably accessible in the lives of patients. His work has been featured in national and international media including the *New York Times*, NPR, and ABC. He also enjoys building in stone.

Haley Douglas was introduced to vipassana meditation in 2008 in a college course on Behavioral Neuroscience. She eagerly sought out other resources on meditation and completed a course in Mindfulness-Based Stress Reduction. Following the personal changes in stress that Haley noticed, she began working in several labs, investigating the effects of mindfulness on health and substance use. Now a graduate student in Clinical Psychology, Haley continues her meditation practice to bolster her health and well-being. Additionally, she has attended several retreats and continues to work in the field of mindfulness and health.

Guy Claxton is a cognitive scientist who writes about mind, body, creativity, and learning. Much of his work has been in education, trying to persuade schools to weave the building of positive learning habits and attitudes ("Building Learning Power") into everyday lessons and school activities. As a cognitive science writer, his books concern the importance of unconscious and bodily underpinnings of human intelligence. His latest book in this field is *Intelligence in the Flesh: Why Your Mind Needs Your Body Much More Than It Thinks*. He has also written about Buddhism and the relationship between Eastern religious traditions and contemporary psychology over many years. He is retired from full-time university life, being now a Visiting Professor of Education at King's College London and Emeritus Professor of the Learning Sciences at the Centre for Real-World Learning, University of Winchester. He is the author of a dozen well-respected books on the mind, including *Hare Brain, Tortoise Mind: Why Intelligence Increases When You Think Less* (1997), *Wise Up: The Challenge of Lifelong Learning* (1999), and *The Wayward Mind* (2005). His Building Learning Power approach has influenced youngsters' lives throughout the UK, as well as in Singapore, Sweden, Brazil, Australia, and New Zealand. Guy Claxton holds degrees from Cambridge and Oxford, and is a Fellow of the British Psychological Society and of the Academy of Social Sciences.

Juliane Eberth studied psychology at Technische Universität Chemnitz from 2005 to 2010. Her diploma thesis comprised a meta-analysis of the effects of meditation on psychological variables, for which she received an award from the German MBSR-MBCT association. After receiving her diploma she started working on her dissertation, which deals with the effects of mindfulness meditation. This research is being financed by a scholarship of the Free State of Saxony. Together with Peter Sedlmeier she published two meta-analyses on the effects of meditation in general and on the effects of mindfulness meditation.

Matthew Enkema is a pre-doctoral student of Clinical Psychology at the University of Washington. His interests include treatment for addiction, craving, and mechanisms of action in mindfulness-based treatments for addiction. He began formal meditation practice in 2007, informed primarily by the Theravada tradition, and has been working with individuals struggling with substance use problems and addiction since 2011.

Paul E. Flaxman is a Senior Lecturer in Organisational Psychology at City University London. He has previously held research and teaching positions at London Guildhall University and Goldsmiths College (University of London). While at Goldsmiths, he helped to implement a series of work redesign interventions for improving staff well-being in financial services and local government organizations. Dr. Flaxman was also involved in two separate research projects designed to promote and develop the Health and Safety Executive (HSE) Management Standards for work-related stress. He is currently the Programme Director of City's Organisational Psychology Group. Dr. Flaxman specializes in adapting cognitive behavioral therapy (CBT) interventions to help improve employees' psychological health. Most notably, he has taken a prominent role (alongside Professor Frank Bond) in developing and evaluating acceptance and commitment therapy (ACT) as a worksite training intervention.

Erin Harrop is a social welfare doctoral student at the University of Washington School of Social Work. She graduated with her Master of Social Work in 2014 from the University of Washington, after completing her clinical internships at Seattle Children's Hospital Adolescent Medicine Clinic and at Fairfax Hospital. Her primary clinical interests include women's mental health, particularly issues of eating disorders, substance abuse, and size-related stigma. Erin is also completing a teaching practicum with the Skillful Meditation Project, and believes in the integration of mindfulness practices into her therapeutic work.

Tatyana Kholodkov completed her Bachelor's degree in Psychology at the University of Wyoming and her Master's in Experimental Psychology at Old

Dominion University. She is currently a clinical psychology intern at the Durham VAMC, where much of her direct patient care involves implementation of mindfulness interventions. She completed her Clinical Psychology Ph.D. from the University of Wyoming in August 2015, and shortly thereafter started a full-time clinical psychology post-doctoral fellowship through Integrative Medicine at Duke Medical Center. Her research interests include difficulties with emotion regulation (and behaviors such as non-suicidal self-injury), treatment outcome studies, and the role of mindfulness in psychotherapy. She enjoys helping those she works with to find fulfillment in life and attend to holistic wellness. She maintains a personal mindfulness meditation practice in the tradition of Thich Nhat Hanh, and is also a practitioner of yoga. In her free time, you can find her wandering in wilderness, cooking for others, and hanging upside-down on aerial silks.

Joda Lloyd is a lecturer and researcher in occupational psychology at Goldsmiths' Institute of Management Studies (IMS). She is a chartered psychologist with the British Psychological Society (BPS), and a registered occupational psychologist with the Health and Care Professions Council (HCPC). Dr. Lloyd's research focuses on the application of a contextual cognitive-behavioral theory, known as acceptance and commitment therapy (ACT), and its underlying mechanism of change—psychological flexibility—to workplace health and performance. Major projects have included the application of ACT-focused psychological skills interventions to improving client-focused attitudes and burnout in the human services, as well as the development of new methods to assess psychological flexibility in the workplace. More recent projects concern the application of ACT-based technologies to performance coaching in the workplace, as well as examinations of how ACT and psychological flexibility can inform our understanding of minority status, identity management, and prejudice and discrimination in the workplace. Dr. Lloyd regularly presents on her research in both UK and international conferences, and is involved in a number of special interest groups and societies concerned with the promotion and dissemination of ACT-focused research and practice.

Maika Puta studied psychology at the Technische Universität Dresden from 2005 to 2010 and specialized in applied health psychology afterwards. Since 2011 she has been a Ph.D. candidate at the Technische Universität Chemnitz, carrying out research on the Three-Guna-Modell from Indian Psychology. This research is being financed by a scholarship of the Foundation of the German Economy. She has published a chapter on the Gunas (with Peter Sedlmeier) in the book *Meditation: Neuroscientific approaches and philosophical implications* (Springer Press 2014). Since 2015 she has been

the head of the Sattva Center in Berlin, which offers seminars relevant to psychological health.

Antonino Raffone completed a Ph.D. in Psychology at the Sapienza University of Rome, and the European Diploma in Cognitive and Brain Sciences. He holds a position of Associate Professor at the Department of Psychology of the Sapienza University of Rome. Both the research and teaching of Dr. Raffone are mainly focused on consciousness, attention, and mindfulness, and their neural correlates, with different methods of investigation. Dr. Raffone has been the author of several international research articles on these topics and related aspects, including publications in the *Journal of Cognitive Neuroscience, Psychological Review*, and *Consciousness and Cognition*. He has also edited a theme issue of *Philosophical Transactions of the Royal Society B* on perceptual awareness. He is active in promoting the practice of mindfulness and meditation in several contexts, including prisons, and in related research. He has organized several national and international events about mindfulness, and directs the Master in "Mindfulness: Practice, Clinical Applications and Neuroscience" at the Sapienza University of Rome. Dr. Raffone started to study and practice Buddhism and meditation in 2004 with Professor Peter Harvey, and then became a dedicated Soto Zen Buddhist practitioner (with Ven. Dario Doshin Girolami), a tradition in which he received a lay ordination in 2009. He also assists Henk Barendregt in *vipassana* meditation retreats.

Corey Roos is currently a doctoral student in Clinical Psychology at the University of New Mexico and his mentor is Dr. Katie Witkiewitz. He is interested in mindfulness-based interventions for substance use disorders, the application of technology in the delivery of empirically-supported treatments, and the role of emotion regulation in alcohol and substance use behavior change.

Peter Sedlmeier is Professor of Psychology at the Technische Universität Chemnitz. There, he mainly teaches research methods and cognitive psychology. Apart from being involved in meditation research, together with his group, he conducts research in music psychology, psychology of time, special aspects of psycholinguistics, and judgment under uncertainty. He has held positions at the University of Salzburg, the University of Chicago, the University of Münster, and the University of Paderborn, and has spent several of his sabbaticals at Pondicherry University, India.

Jason M. Thompson was born in England and as an undergraduate studied English Language and Literature at Oxford University. After university he spent six years researching and producing documentaries for the BBC and

Channel 4 in London. Following emigration to the United States in 1999, he taught at public elementary, middle, and high schools in inner-city Oakland, California, prior to embarking on a Ph.D. in Clinical Psychology at Palo Alto University, California, with emphases on the psychology of meditation and community mental health. His dissertation ("Neural and linguistic correlates of decentering in focused attention and open monitoring meditation") examined the neurophenomenology of meditation-related self-awareness changes, using data he collected in a research assistant capacity from a National Institutes of Health-funded fMRI study of meditation and hypnosis at Stanford University School of Medicine. He is currently completing his pre-doctoral internship in the Child and Adolescent Services Multicultural Clinical Training Program in the Department of Psychiatry at the University of California, San Francisco, based at San Francisco General Hospital.

Lynn C. Waelde is a professor at the Pacific Graduate School of Psychology of Palo Alto University and a consulting professor in the Department of Psychiatry and Behavioral Sciences at the Stanford University School of Medicine. She is director of the Inner Resources Center, a specialty clinic of the Gronowski Psychology Center, and Director of the Meditation and Psychology Area of Emphasis in the Clinical Psychology Ph.D. program at Palo Alto University. Dr. Waelde's clinical and research interests focus on therapeutic applications of mindfulness and meditation and on predictors and manifestations of stress disorders. Dr. Waelde developed the Inner Resources program so that the powerful techniques of mindfulness, mantra, and meditation could be adapted to meet the specialized needs of people with health and mental health issues. As an affiliated scholar of the Stanford Center on International Conflict and Negotiation, Dr. Waelde works collaboratively to integrate trauma and mindfulness perspectives into peace-building. Dr. Waelde is a New Orleans native who received a Bachelor's degree in Psychology and a Master's degree in Anthropology from Louisiana State University. She received a doctorate in Developmental Child Clinical Psychology from the University of Colorado at Boulder. She completed a pre-doctoral internship at the Veterans Affairs Medical Center in New Orleans, where she completed training as a post-traumatic stress disorder specialist. Dr. Waelde has been a lifelong student of hatha yoga and meditation.

Katherine Weare is Emeritus Professor at the University of Southampton, and Honorary Visiting Professor at the University of Exeter. She is known internationally for her work on mental health, well-being, and social and emotional learning in schools, including mindfulness and compassion. She has published widely in the field, engaging in research projects, reviewing

the evidence base on "what works," advising policy makers, and developing practical strategies in schools. Her book, *Developing the Emotionally Literate School*, remains a bestseller in the field. She was a key player in developing the UK's national whole school SEAL (Social and Emotional Aspects of Learning) program. She continues to develop and evaluate cutting-edge work and is currently working with mindfulness programs such as the Mindfulness in Schools Project, the Plum Village Community, and Mind and Life to develop and evaluate new programs and approaches, and is advising agencies such as the EU, WHO, and the UK government on ways forward. She is on the core development group of an international network, SMiLE, the School Mental Health Leadership Exchange. As an adoptive parent she is currently working with key agencies in developing new work on mindful parenting, including in connection with attachment and trauma.

Michael A. West is Professor of Work and Organizational Psychology at Lancaster University Management School, Senior Fellow at The King's Fund in London, Senior Fellow of The Work Foundation, and Emeritus Professor at Aston University. He was formerly Executive Dean of Aston Business School. He graduated from the University of Wales in 1973 and received his Ph.D. in 1977 for work on the psychology of meditation. He has authored, edited, or co-edited 25 books, including *The Psychology of Meditation* (1987), *The Psychology of Work and Organizations* (2010), *The Essentials of Teamworking: International Perspectives* (2005), *Effective Teamwork* (2012), the first edition of which has been translated into 12 languages, and *The International Handbook of Organizational Teamwork and Cooperative Working* (2003). He has also published over 200 articles for scientific and practitioner publications, as well as chapters in scholarly books. He is a Fellow of the British Psychological Society, the American Psychological Association (APA), the APA Society for Industrial/Organizational Psychology, The Academy of Social Sciences, the International Association of Applied Psychologists, and the British Academy of Management, and is a Chartered Fellow of the Chartered Institute of Personnel and Development. His areas of research interest are team and organizational innovation and effectiveness, particularly in relation to compassionate cultures and leadership of health services. He lectures widely both nationally and internationally about the results of his research on reflexivity, meditation, mindfulness, culture, compassion, and leadership, and his solutions for developing effective and innovative organizations.

Katie Witkiewitz is an Associate Professor of Psychology at the University of New Mexico with a joint appointment at the Center on Alcoholism,

Substance Abuse, and Addictions. The underlying theme of her research is the development of empirically-based models of substance use, with an emphasis on applying advanced quantitative research methods to better understand changes in substance use behavior over time. Dr. Witkiewitz is also a licensed clinical psychologist and has worked extensively on the development of a theoretical model of biopsychosocial influences on substance use relapse. This research has led to her collaborative work on the development and evaluation of mindfulness-based relapse prevention for substance use disorders. She has conducted numerous empirical studies on the prediction of alcohol relapse following treatment for substance use disorders, mechanisms of successful alcohol treatment outcomes, and the development of interventions to prevent alcohol and substance use relapse. Her research has been supported by grants from the National Institute on Mental Health, the National Institute on Drug Abuse, the National Institute on Alcohol Abuse and Alcoholism, and the National Cancer Institute.

Part 1

Meditation perspectives

Chapter 1

The practice of meditation

Michael A. West

Introduction

Blessed (or cursed) with self-awareness and consciousness, humans are faced with the simple, stunning reality of our existence: With a planet teeming with life in a universe vaster than our imaginations can encompass. And we are faced with the miracle of our individual births and the ever-present inevitability of our deaths. We can contemplate the history of our species, responsible for the destruction of most large mammalian species and countless others besides, and now threatening the viability of the ecosystem that sustains us. And we busy ourselves, in the context of all this, with politics, economics, social media, soap operas, and newspapers; with our neighbors' transgressions and our plans for TV viewing; with football teams and holiday destinations; with fashion choices and religious wars. Busy humans, exercising huge influence on this planet, and busily preoccupied with our busy stuff—with our desire to increase our pleasure and reduce our pain and vaguely aware that we are not quite getting it right, either individually or collectively. And working hard to avoid confronting the fact that we may be getting it very wrong indeed.

All of this experience is mediated through our minds—actually through our bodies and minds as a single system—but how we understand, cope with, make sense of, come to terms or fail to come to terms with our existence and experiences is through the functioning of our minds. To truly appreciate our situation, our predicaments, our paths forward, to more directly engage with experience and existence, therefore, we also need to understand and perhaps better nurture the functioning of our minds.

The practice of meditation is a way of coming to experience more fully our moment-by-moment existence by encountering the mind directly. Meditation involves increasing awareness of the body (sensations), emotions, thoughts, the mind, and mental qualities (e.g., turgid, clear, focused). Through practice, the aim is for this awareness to be increasingly non-reactive though more acute to events and experiences—the sound of a bird, a shout in the distance, a sensation of minor physical discomfort, an angry thought, a worry about an unfinished task, a desire, a fundamental fear. It offers a means of opening to or connecting

with all experience, whether positive, negative, or neutral, in a (relatively) unfiltered, unprocessed way. It offers the ability, with practice, to enable the development of awareness of awareness itself. The aim is also to reduce suffering as a consequence of this greater openness, through reduced reactivity to experience and increasing well-being (Germer et al. 2005; Hogan 2014; Woodruff et al. 2014). There is a wealth of experience and knowledge of meditation that stretches back thousands of years.

In this chapter, we will consider the practice of meditation in different religious contexts, in human history, across cultures, and in literature. The chapter describes the growth of research in psychology into meditation and charts the huge rise in interest in "mindfulness" over the last 15 to 20 years. And the chapter will offer a way of understanding meditation and mindfulness as overlapping and distinct approaches, before concluding with a brief description of the subsequent contents of the book.

Meditation may be defined as an exercise in which the individual turns attention or awareness to dwell upon a single object, concept, sound, image, or experience, with the intention of gaining greater spiritual or experiential and existential insight, or of achieving improved psychological well-being (West 1987). And to move from definitional concept to experience, the reader may try the simple breathing meditation, described in Box 1.1.

Box 1.1 Openness and contentment in meditation

Sit quietly in an upright position in a place where you are unlikely to be disturbed.

Close your eyes and then become aware of the sensation of your whole body, letting go of any obvious tightness or tension.

Enjoy the sensation of your body being still and sit quietly like this for about half a minute.

Now let your attention go to your breathing—perhaps where your stomach moves with your breath, or where your chest rises and falls with each breath, or in the windpipe, or in your nostrils, or at the point where the breath enters and leaves the nostrils. It doesn't matter where.

And then each time you breathe out, say the word "one" silently to yourself.

You don't have to concentrate hard on the breath or repeating the word "one." You don't have to try to think the word clearly at all times to the exclusion of everything else.

Box 1.1 Openness and contentment in meditation (continued)

Continue the meditation in this way for a quarter of an hour, remembering that you don't have to achieve some deep level of meditation or relaxation.

The key is to have an attitude of openness and contentment with the practice.

From time to time there will be thoughts that distract you from the sensation of your breathing and repeating the word "one" on the out-breath. Thoughts are a key part of the practice rather than mistakes or something to be strenuously resisted.

Treat thoughts (or noises) as you would treat clouds drifting across the blue sky. You don't hold on to them and you don't push them away either. You just watch them come and go and, when you become aware that you have drifted away from dwelling on the sensation of breathing, very gently and easily return your attention to the breathing.

Not with some sharp self-remonstration but in a gentle, open, contented way, accepting the fact that you had drifted away on a succession of thoughts and then comfortably moving very smoothly back to watching your breathing.

Remember to take it easily, quietly, and simply. And with an attitude of openness and contentment.

Varieties of meditation practices

Traditionally meditation has been practiced to achieve a direct experiential knowledge of an absolute such as God, Being, Oneness, Buddha nature—each of these labels being a product of a religious or personal belief system. In the last 60 years, large numbers of people in Europe and North America have learned and practiced meditation, many of them with a quite different purpose in mind: To relieve distress or improve psychological well-being.

By what methods do people seek these differing outcomes? One of the more common forms of meditation involves repeating a sound (sometimes called a "mantra") either silently or aloud, and the meditator is taught to focus attention on the sound, not favoring other thoughts, external stimuli, and desires. The sound or mantra may be chosen by the meditation teacher as being particularly suitable or powerful for the individual; it may be the name or attribute of a god (Krishna, Ram), or it may be the name of a revered teacher (other examples are "so-hum," "om," "she-am"). The degree of focus or concentration on the mantra varies according to teachers, schools, and systems. In some the meditator is urged almost to grit the teeth and strenuously push away thoughts and sensations that

intrude during meditation. But most practitioners are taught to develop a more relaxed awareness, neither driving thoughts nor sensations away, but not holding on to them either. Rather, the idea is to persistently and easily return attention to the central focus (Hewitt 1978).

Objects of meditation can also be visual such as a candle flame, a picture of a teacher or "guru," or meaningful visual symbols such as the Christian cross or the Judaic star. Even movement can be used as a focus of meditation; the repetitive touching of the tips of the four fingers with the thumb or the simple act of walking are both movements used as a focus for attention in meditation. There are meditation practices that focus on our impermanence and death; others that focus on transmitting compassion to our loved ones, to enemies, to our communities, to all sentient beings, and to all beings in the universe. There are practices that involve visualizing oneself as a revered god or teacher such as Krishna, Buddha, or Ganesh. And in Zen Buddhism, one practice is "just sitting" or *shikantaza* in the meditation hall and experiencing all that arises in an accepting and attentive way. The practitioner is urged to be diligent in maintaining awareness and curiosity in order to learn about the nature of the mind and, thereby, the nature of existence.

In the last 20 years there has also been an exponential growth in the use of "mindfulness" techniques in which the meditator may attempt to let the attention dwell on "all that is here and now" in his or her environment and consciousness (Ie, Ngnoumen, and Langer 2014a,b). We will return to discuss mindfulness later in this chapter and it is addressed by many of the contributors later in the volume. And, as we review historical and cross-cultural practices of meditation, still further varieties of meditation practice are revealed.

Meditation across cultures and through history

Meditation has been practiced in various forms for at least 2500 years and probably for very much longer. It is striking that these practices have been sustained for so long and across many different cultures. Curious too is how elaborate methods from one culture resemble techniques in other cultures. Native Americans practiced a form of meditation similar to the *shikantaza* of Japan. In Botswana, the people of the Kung Zhu/twasi practice a form of ritual dancing that they believe activates an energy (n/um) located at the base of the spine and which produces an ecstasy experience (Katz 1973, 1999). According to Hindu philosophy and yoga teachings there are subtle psychic sense organs and a particular force called the Kundalini located at the base of the spine. In Kundalini yoga, the meditator focuses attention on this energy source and, through concentration, arouses this energy. The energy is then believed to travel up the spine

through six centers or *chakras,* evoking at each stage a higher state of consciousness. Eventually it reaches the seventh *chakra* (the crown *chakra)* and the meditator achieves a state of perfect enlightenment.

Many groups on the African continent have practiced ritual dancing coupled with chanting to produce an altered state of consciousness. In shamanism, a holy person (the shaman) intones a sacred chant to achieve trances (Benson 1975) that offer insights and enable healing; it is widely practiced in North and South America, Indonesia, Siberia, and Japan. Freuchen (1959) describes how the Polar Inuit people in Greenland would sit facing a large soft stone and, using a small hard hand stone, continuously carve a circle in the large stone for periods stretching to days, to produce a spiritual trance state (for descriptions of more meditation practices see Benson et al. 1974; Goleman 1977; Hewitt 1978; Ornstein 1972; White 1974).

However, meditation techniques are not confined to the religions of the East or to those of simpler societies; meditation has long been part of Christianity. St Augustine (AD 350–430) wrote of a method of contemplating that he used to:

> . . . pass even beyond this power of mine which is called memory; yea I will pass beyond it, that I might approach unto thee, O sweet light (Butler 1922).

Another example of Christian meditation comes from an anonymously written fourteenth-century work called *The Cloud of Unknowing* (Progoff 1969). The author writes that the way to attain union with God is to beat down thoughts through the repetition of a single-syllable word such as "God" or "love":

> Clasp this word tightly in your heart so that it never leaves it no matter what may happen. This word shall be your shield and your spear whether you ride in peace or in war. With this word you shall beat upon the cloud and the darkness, which are above you. With this word you shall strike down thoughts of every kind and drive them beneath the cloud of forgetting. After that, if any thoughts should press upon you . . . answer him with this word only and with no other words.

Fray Francisco de Osuna, a tenth-century monk, writing in *The Third Spiritual Alphabet,* describes an exercise very similar to Buddhist techniques:

> Keep (your eyes) fixed steadily on the ground, like men who are forgetful and, as it were, out of themselves, who stand immovable, wrapt in thought . . . it is better . . . to keep our gaze fixed on the ground, on some places where there is little to look at so there may be less to stir our fancy and our imagination. Thus, even in a crowd you may be deeply recollected by keeping your gaze bent, fixed on one place. The smaller and darker the place, the more limited your view will be and the less will your heart be distracted (Osuna 1931).

Among the earliest Christians, the Desert Fathers practiced silently repeating the *"kyrie eleison"* to help them achieve a state called *"quies"*—a state of rest

where "nowhereness and nomindness" purified the soul. They sustained this silent repetition throughout their daily lives "until it became as spontaneous and instinctive as their breathing" (Merton 1960). In the fifth century AD, Hesychius gave instruction in the "Prayer of the Heart," the practice of which was intended to provide a "sure knowledge of God, the Incomprehensible" (French 1968). The instructions are indistinguishable in their mechanics from many practices we call meditation:

> Sit down alone and in silence. Lower your head, shut your eyes, breathe out gently, and imagine yourself looking into your own heart. Carry your mind, i.e. your thoughts, from your head to your heart. As you breathe out say "*Lord, Jesus Christ, have mercy on me*." Say it moving your lips gently or say it in your mind. Try to put all other thoughts aside. Be calm, be patient and repeat the process very frequently (French 1968).

In the Judaic religion, it is common to repeat a simple prayer accompanied by swaying movements in order to bring exaltation. There are practices involving mental focusing on body posture and techniques of concentration on magic seals. In the *Chandogya upanishad* of Hinduism, devotees are urged to "reverence meditation." In the *Sutrakritanga sutra,* Jains are taught that "he whose soul is purified by meditating is compared to a ship in water. Like a ship reaching the shore, he gets beyond misery."

In the Sufi tradition, Al-Ghazali describes the practice of Dhikr:

> . . . as he sits in solitude, let him not ease saying continuously with his tongue, "Allah, Allah" keeping his thought on it. At last he will reach a state where the motion of his tongue will cease, and it will seem*s* as though the word flowed from it. Let him persevere in this until all trace of motion is removed from his tongue, and he finds his heart persevering in the thought. Let him still persevere until the form of the word, its letters and shape, is removed from his *hear,* and there remains the idea alone, as though clinging to his heart, inseparable from it (Nicholson 1914, p. 48).

It is clear that meditation practices are or have been widely used in all the world's major religions over many centuries.

What evidence is there of meditation practice outside of established religions? In an exploration of mysticism in English literature, Spurgeon (1970) explored the writings of Bronte, Wordsworth, and Tennyson to illustrate her theme. Her evidence suggests that meditation experiences have been seen as significant by many outside the religious and mystical traditions. Wordsworth believed a passive attitude, beyond the intellect and desires and above petty disputes, would enable one to reach a "central peace subsisting for ever at the heart of endless agitation." Such practice would lead to:

> . . . that serene and blessed mood
> In which the affections gently lead us on
> Until the breath of this corporeal frame

And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul;
While with an eye made quiet by the power
Of harmony, and the deep power of joy
We see into the life of things.

Tennyson would mentally repeat his name continually to encourage experience of the "unity of all things, the reality of the unseen, and the persistence of life." Lines from *The Ancient Sage* illustrate his experience:

. . . more than once when I
Sat all alone, revolving in myself
The word that is the symbol of myself
The mortal limit of the Self was loosed
And passed into the nameless, as a cloud
Melts into heaven . . .

No doubt many experience something of such states, perhaps sitting on a hilltop on a summer's day, savoring the stillness of the hills and trees, or perhaps in other moments of deep peace and relaxation. Meditation, when practiced regularly, is a way of more easily evoking feelings of equanimity, wholeness, intuitive understanding, and a sense of connection with the external world.

In Zen Buddhism, the practice of *shikantaza*—simply a quiet awareness, without comment, of whatever happens to be here and now—is proposed to lead to a vivid sensation of "nondifference" between oneself and the external world, between the mind and its contents—the various sounds, sights, and other impressions of the surrounding environment (Watts 1957).

In the Rinzai Zen school, the meditator is asked to hold in his or her mind an illogical question ("*koan*") such as "What is the sound of one hand clapping?" or "What did my face look like before I was born?" or "What am I?" As a result of persistently interrogating the question, the individual (it is claimed) will eventually achieve a sudden and intuitive understanding—"One seeks and seeks, but cannot find. One then gives up, and the answer comes by itself" (Watts 1957).

Questions, dances, candle flames, movements, sitting quietly, secret sounds, repetition—can all these be subsumed under the same heading of meditation techniques, or is there a danger of categorizing together quite dissimilar behaviors? Naranjo (1974, p. 19) proposed that all these practices have a common element:

Just as we do not see the stars in daylight, but only in the absence of the sun, we may never taste the subtle essence of meditation in the daylight of ordinary activity in all its

complexity. That essence may be revealed when we have suspended everything else but US, our presence, our attitude, beyond any activity or the lack of it . . . Against the background of the simplicity required by the exercise, we may become aware of ourselves and all that we bring to the situation, and we may begin to grasp experientially the question of attitude.

Why do we practice meditation?

Do people share fundamentally similar objectives in their persistence with meditation practice or do those from different traditions have unique aims? Interviews with those practicing meditation suggest a variety of reasons (often unclear) but with one underlying theme: that people generally seek a clearer understanding of existence or closer connection to the spiritual, and that the increasing clarity and connection help in the experience of daily living (West 1986, 1987). Here are some explanations for why they meditate offered by long-term meditators from a variety of different traditions:

> It's my central belief, the heart of me. I feel I should honour that part of me . . . all of it leads up to the purest expression of me.
>
> I enjoy meditation because physically it feels good and it's interesting in terms of the insight that I get into myself and the more I can watch all this stuff going on and accept it, the more I can reveal myself to others.
>
> It's the heart of life . . . It makes life whole . . . you can make it take in the whole day or everybody you know or everything you have to do. It has the sense of pulling everything together, so it's a real centre.
>
> I meditate because it calms me down and I see it as the only real hope to get rid of suffering by gaining complete control over the mind so that eventually your thoughts, feelings and actions are totally positive.
>
> It's a way of being in touch with the Universe.
>
> Meditation provides me with space. It's a time of caring for myself, free from demands and needs and a time of being peacefully alone and still to allow my pure and perfect self to open more and more.
>
> (West 1987, p. 11)

To what extent is there a consensus of objectives amongst the many traditions that encourage the practice of meditation? Goleman (he of emotional intelligence fame!) argued that there is a common objective hidden in the differing folds of customs, language, and symbols (Goleman 1977). In the Hindu Bhakti tradition it is believed that love for the deity, which is expressed in regular meditation on the name of the god, changes to a transcendental love:

> '. . . the devotee loses all sense of decorum and moves about the world unattached . . . His heart melts through love as he habitually chants the name of his beloved lord . . .'
> (*Srimad Bhagavata*)

Eventually, beyond this state, the devotee will arrive at a point where he or she perceives the divine in everything and everyone:

> The devotee need no longer observe any special forms or symbols for worship. He worships in his heart, the world having become his altar (Goleman 1977).

In the Jewish Kabbalah, it is believed that there are multiple levels of reality with corresponding levels of consciousness. Most of us are at the lowest levels and live very mechanical lives of habit and routine with little awareness of our existence. Through meditation, according to the Kabbalist view, we first become disillusioned with the mechanical games of life, and then begin to break free from the bondage of our egos. The ultimate goal along the path of the Kabbalist is "*devekut*," in which the seeker's soul becomes one with God. At this point, the Kabbalist is now a supernatural saint who has equanimity, indifference to praise and blame, a sense of being alone with God, and the gift of prophesy. All of his or her behavior is directed to serving God's purpose not the ego; there is a union between the individual and the essence of existence (Halevi 1976).

In Christian Hesychasm and other Christian mystic traditions, meditation was practiced to enable "the old superficial self to be purged away and (permit) the gradual emergence of the true, secret self in which the Believer and Christ were 'one spirit'" (Merton 1960). St Isaac describes the enlightened Christian as one who:

> . . . has reached the summit of all virtues, and has become the abode of the Holy Spirit . . . when the Holy Spirit comes to live in a man, he never ceases to pray, for then the Holy Spirit constantly prays in him (Kadloubovsky and Palmer 1969).

In the Sufi tradition of Islam, meditation is a central practice in the attempt to reach a state called *fana* or "passing away in God." According to Sufi doctrine, our lives are a thin illusion of habitual reactions, imprisonment by desires, and endless suffering (almost identical in content to Buddhist teachings). We are asleep but we do not know it. Through regular practice of meditation and remembrance of God we can achieve an increased absorption in God. The goal of Sufi meditation or "*zikr*" is to overcome the mind's waywardness and random play, and to achieve one-pointedness on God, so that God pervades the mind's activity.

Perhaps there is an echo across these different paths of a merging or submerging of the self in some absolute. A similar notion exists at the heart of the teaching of the Transcendental Meditation organization. Through this form of meditation, the meditator can achieve the experience of pure Being, devoid of content, thoughts, specific sensations, memories, reactions; one experiences simply what it is to be (Yogi 1995). With regular practice the meditator will achieve "cosmic consciousness," in which state, awareness of pure Being permeates all of his or her activities during waking, sleeping, and dreaming. In this

state of permanent pure awareness, the individual is free from desire and needs for personal gain. He or she acts spontaneously, in accordance with a divine cosmic purpose as an instrument of God. Beyond this, at the highest states of consciousness, the meditator experiences all things without illusion and experiences a complete unity with God and all creation.

Goleman (1977) concluded that there are commonalities both of method and of objectives across these disparate traditions and approaches. He sees the need to retrain attention during meditation as the "single invariant ingredient in the recipe for altering consciousness of every meditation system. At their end the distinction between meditation avenues melts." Although each path uses different names, Goleman (1977, pp. 117–18)believes that they ". . . propose the same basic formula in an alchemy of the self: the diffusion of the effects of meditation into the meditator's waking, dreaming and sleep states . . . As the states produced by his meditation meld with his waking activity, the awakened state ripens. When it reaches full maturity, it lastingly changes his consciousness, transforming his experience of himself and of his universe."

So far we have examined what meditation is, how it is practiced, and what the purpose of meditation is in the various traditions. Now we pause to see how psychologists have understood and categorized these practices.

Typologies of meditation

Naranjo (in Naranjo and Ornstein 1971) distinguished between three types of meditation called respectively the Way of Forms, the Expressive Way, and the Negative Way. The Way of Forms includes meditation upon external symbols and objects such as candle flames, mandalas, koans, questions, and mantras. Naranjo calls this the way of concentration, absorption, union, outer-directed, and Apollonian meditation. One example of concentrative meditation is Ramana Maharshi's method of meditating upon the question "Who am I?" There is a focusing of attention and a centeredness on the question (which could be substituted by a mandala, flame, lotus flower, mantra, or focus on breathing).

The Expressive Way includes those meditations that involve receptivity to the contents and processes of consciousness. In this type the meditator "dwells upon the form that springs from his own spontaneity, until he may eventually find that in his own soul lies hidden the source of all traditions" (quoted in Naranjo and Ornstein 1971). Naranjo describes the Expressive Way as the way of freedom, transparency, surrender, inner-directed, and as the Dionysian way. It involves letting go of control and being open to inner voices, feelings, and intuitions. Naranjo suggests that the best illustration is to be found in shamanism—"Not only is shamanism in general a mysticism of possession, but the shaman's trance

is usually content-oriented . . . He is one who has attained communication with the supernatural and may act as a mediator between spirits or gods and man, making the desires of each known to each other" (quoted in Naranjo and Ornstein 1971, p. 97).

Finally, there is the Negative Way—involving elimination, detachment, emptiness, centering. The meditator puts effort into moving away from all objects and not identifying with anything perceived:

> By departing from the known he thus allows for the unknown, by excluding the irrelevant he opens himself up to the relevant, and by dis-identifying from his current self concept, he may go into a conceptual awakening of his true nature (quoted in Naranjo and Ornstein 1971, p. 29).

In this approach the aim is to withdraw attention from both external perceptions and internal experience "to cultivate a detachment toward psychological acting in general" (Naranjo 1974, p. 29). Thus, a good example of the Negative Way is *vipassana* meditation, a Buddhist approach involving "bare attention." In this method the meditator merely registers sense impressions, feelings, and mental states without reacting to them by deed, speech, or mental comment:

> By cultivating a receptive state of mind, which is the first stage in the process of perception, bare attention cleans the mind and prepares the mind for subsequent mental processes (Naranjo and Ornstein 1971).

Ornstein (1972) describes two major types of meditation—concentrative and "opening-up" meditations. The first type he sees as developing one-pointedness of mind and gives as an example the technique of Zen breath counting. This involves counting the breaths from one to ten and then repeating the process. When the count is lost the meditator returns to one and begins again. He sees the "opening-up" exercises not as attempting to isolate the practitioner from ordinary life processes but rather as involving those processes in the training of consciousness. Thus the Zen practice of *shikantaza* or "just sitting" is an exemplar of this type of meditation. Watts (1957, p. 175)describes it as:

> . . . not therefore, sitting with a blank mind which excludes all the impressions of the inner and outer senses. It is not "concentration" in the usual sense of restricting the attention to a single sense object, such as a point of light or the tip of one's nose. It is simply a quiet awareness, without comment, of whatever happens to be here and now. This awareness is attended by the most vivid sensation of "non-difference" between oneself and the external world, between the mind and its contents —the various sounds, sights and other impressions of the surrounding environment. Naturally this sensation does not arise by trying to acquire it.

Shapiro (1982) describes three major attentional strategies—a focus on a whole field (wide-angle lens attention), a focus on a specific object within a field

(zoom-lens attention), and a shifting back and forth between the two. The first type would include mindfulness techniques such as "just sitting." Another example would be *vipassana*, which Ross (1981, p. 159)describes as the central practice of Buddhism:

> . . . the continual effort to at first note and later to just be one with the immediacy of one's situation; to break the adhesive of one's constant train of conceptual thought about past, present and future; and to bring oneself with clarity to the touch and consciousness of the present. The practice of mindfulness greatly deepens the power of concentration and the ability to stay with one's life situation.

Zoom-lens attention is what both Ornstein and Naranjo call concentrative meditation but the third type, shifting back and forth, is a novel category quite different from Naranjo's, and includes passive concentrative techniques such as transcendental meditation (TM). It is argued that in TM there is both concentration and mindfulness and that with increasing adeptness, mindfulness becomes more dominant (Brown and Engler 1980; Welwood 1982).

Goleman (1977) distinguishes two paths of meditation, essentially the same as those identified by Ornstein; he calls them the paths of concentration and insight. Not only are the meditation types different, he argues, but the experiences along the paths of meditation practice will be quite distinct too. On the path of concentration the meditator will develop deeper and deeper absorption and one-pointedness, going through eight "*jhanas*" (full absorptions) to achieve a final state "so subtle that it cannot be said whether it is or not" (p. 19). The path of insight involves developing deeper mindfulness and insight through stages of "pseudonirvana," realization, and effortless insight to nirvana, in which state the meditator "will have utterly given up the potential for impure acts" (p. 32).

And confronting all of these is Krishnamurti (1987), who held that all techniques are an obstacle to the unfettered, unblemished experience of existing here and now. Meditation systems with mantras, techniques, teachings, traditions, and stipulations simply lead us to exchange one illusion for another. He argued that we are in a constant state of mental conflict as a result of making comparisons between what is and what should be. Consequently, we hide away in a construction of daily habits, mechanical repetition, dreams of the future, and memories; we do not live in the present moment. Krishnamurti urged the development of a kind of opening-up meditation—"choiceless awareness"—a clear and direct perception of experience now, without imposing names, preconceptions, and habitual perceptions upon our experience. It is only by watching the contents of consciousness that we can perceive the ways of our minds and begin to understand experience directly and not through symbols created by our intellects (Krishnamurti 1987). Freed from conditioned habits of perception

and cognition one can be free of the self and therefore free to love. This leads to a state of aloneness beyond loneliness and an ability to attend without motive; thus one can live in the world with clarity and reason (Coleman 1971).

Krishnamurti's approach is mirrored to some extent by the huge increase in interest in what has come to be called mindfulness—this increase in interest can be seen as a revolution in interest in meditation and has taken place over the course of the last 15 years.

The "mindfulness" revolution

> "Whether you walk, stand, sit, lie down, or sleep, whether you stretch or bend your limbs, whether you look around, whether you put on your clothes, whether you talk or keep silent, whether you eat or drink—even whether you answer the call of nature—in these and other activities you should be fully aware and mindful of the act performed at the moment. That is to say, that you should live in the present moment, in the present action."
>
> (Rahula 1959)

Mindfulness as a concept is not new, as the quotation from Rahula reveals. However, the explosion of interest in mindfulness, to the point where it is now such a well-known concept, very much is. Formal definitions include "moment by moment awareness" (Germer et al. 2005); "paying attention with purpose, non-judgmentally, and while in the present moment" (Kabat-Zinn 2005); and "the bringing of one's awareness to current experience through observing and attending to the changing field of thoughts, feelings and sensations from moment to moment" (Bishop et al. 2004).

The growth in interest in mindfulness arose from clinical applications, led particularly by Jon Kabat-Zinn (1990, 1994, 2003), who saw it as a practice to promote full awareness of the present moment with the intention of embodying an orientation of calm and equanimity. At the same time another stream of mindfulness research in psychology was flowing, and not springing from a meditation source. The work of Ellen Langer contrasted mindfulness and choice with mindlessness, and prescribed actively drawing novel distinctions in our experience of the world by being in the present moment, staying open to novelty, maintaining alertness to distinctions, nurturing sensitivity to different contexts, and developing awareness of multiple perspectives (Ie et al 2014a). This less well known concept of mindfulness involves a heightened sense of awareness through maintaining an open awareness of novel information and forming new categories out of one's experience.

Here we focus on the concept of mindfulness springing from the meditative traditions—the more widely known approach and most germane to the content of this book. Kabat-Zinn initially defined this as "placing one's attention and awareness in the present moment with an attitude of non-judgemental acceptance"

(Kabat-Zinn et al. 1985). Research by Kabat-Zinn and others suggested that mindfulness practice could be helpful for those experiencing chronic pain (Kabat-Zinn 1982), major depression (Teasdale et al. 2000), anxiety (Kabat-Zinn et al. 1992), and substance abuse (Bowen et al. 2006; Brewer et al. 2009). This mindful practice has four elements:

1 Awareness—of all possible experiences such as sensations in the body, thoughts, emotions, sights, and sounds. It might include awareness of what otherwise would be behaviors we would not normally be aware of, such as intergroup bias: "I am having thoughts and reactions to this person because I know this person is a Muslim and I would not normally be aware of reacting automatically in this way."

2 Sustained attention—this involves gently but firmly bringing attention back to the current moment; reducing rumination; reducing anxious thoughts about the future; and bringing attention back to the here and now.

3 Focus on the present moment—rather than becoming immersed or lost in thoughts about the past, the future, plans, and preoccupations.

4 Non-judgmental acceptance—this involves not making judgments about experience; not labeling or reacting to experience in the current moment as good or bad, desirable or undesirable, but instead allowing experiences to arise without blocking, controlling, changing, or avoiding them.

Mindfulness practice has since been applied in a wide range of clinical settings—in therapy (McCracken 2014), anxiety (Woodruff et al. 2014), post-traumatic stress disorder (Wahbeh 2014), chronic illness (Phillips and Pagnini 2014), eating disorders (Kristeller and Epel 2014), pregnancy (Zilcha-Mano 2014), women's sexual dysfunction (Brotto and Smith 2014), and, of course, stress (Crum and Lyddy 2014).

Meditation versus mindfulness—what is the difference then? It is clear from our review of meditation practices across cultures and history that mindfulness has long been a practice in many different traditions. And part of mindfulness practice in modern settings is having times of formal practice of mindfulness—time sitting and focusing on the breath, the body, sensations, or awareness, as well as mindfulness of experience through the day. So meditation and mindfulness overlap. Many meditation practices, if not all, involve mindfulness—awareness, sustained attention, focus on the present moment, and non-judgmental acceptance.

Therefore, when we try to distinguish between meditation and mindfulness we are distinguishing between the water flowing at overlapping stretches of the same stream. Yes, mindfulness practice is very much about developing awareness of each moment throughout the day, but the purpose of sitting meditation is also to increase the meditator's awareness of the moment (or God, love,

compassion, or whatever). Mindfulness practiced in clinical settings is secular rather than spiritual in orientation, so there is that difference.

However, the reality is that meditation and mindfulness are simply different names for overlapping concepts and practices. Meditation refers mostly (but far from exclusively) to sitting in formal meditation practice, silent and still. Mindfulness mostly refers to maintaining awareness moment by moment in daily living (but this is usually only possible through the regular practice of sitting meditation). They are fundamentally interwoven concepts.

In this book, the contributors will use the terms they choose and make clear what practice they are describing, regardless of the name they choose (meditation or mindfulness).

This book

Part 1 of the book explores meditation as a process informed by cognitive, Buddhist, empirical, and philosophical perspectives. Chapter 2 by Martine Batchelor, who for many years led a life as a Buddhist nun in South Korea and now lives and teaches in France, focuses on what happens when we meditate. She proposes that meditation involves two fundamental processes—concentration and enquiry. Through an exploration of these processes, informed by the insights of Buddhist teachers over the centuries, we can understand how meditation practice changes our experience and our relationship with the world we find ourselves in, both the physical and human environments. The chapter offers profound insights into our condition and how meditation can help us through these twin processes of concentration and enquiry.

Guy Claxton has brought together his long experience as a practitioner of meditation, a writer on Buddhism, and a leading cognitive psychologist in the UK to explore, in Chapter 3, the subtle but powerful processes that occur during meditation. From the perspective of the new science of "embodied cognition," he explores two processes he calls "unfurling" and "welling up." Through the identification of these subtle processes, he explains how meditation comes to offer us more accurate perceptions of our inner and outer worlds, and how we achieve greater congruence of action and experiences, enhanced creativity, and the recovery of core values to guide our living and being.

James Carmody offers another perspective in Chapter 4 on our understanding of meditation in the context of human evolution and development. He provides a clear and parsimonious description of meditation processes and links this to psychological distress. The adaptations for survival and safety that served us well for millennia are no longer appropriate and lead to chronic unease or dissatisfaction. He shows how meditation practice can change this but does so

in a way that is demystifying, offering conceptual coherence rather than mystical ambiguity. He concludes by alerting the reader to the potential dangers in the discourse of some meditative traditions in inuring us to our socio-political contexts.

Loriliai Bernacki, Associate Professor and Director of Graduate Studies in the Department of Religious Studies, University of Colorado at Boulder (USA), provides in Chapter 5 a review of the emergence of meditation in Jainism, Buddhism, and Hinduism. The role of meditation becomes clear in these traditions as a fundamental component of the philosophical understanding of the self and of subjectivity. She provides a phenomenological account (an account based on subjective experience) from the perspective of these disciplines. Noting that the interpretations of effects of meditation vary across traditions, she alerts us to the need to be aware of the filters that philosophy and doctrine place on meditation experience. She explores in some depth the sense of wonder evoked by meditation in a Tantric context.

Part 2 explores therapeutic and clinical applications of meditation and mindfulness practice. In Chapter 6, Lynn Waelde, Professor of Psychology at Palo Alto University and Consulting Professor at Stanford University School of Medicine, and her colleague Jason Thompson examine the use of meditation and mindfulness with clinical populations. They describe how the rationale for the application of mindfulness in clinical populations has been based on the rationale that the development of cognitive processes of attention and equanimity can have important therapeutic applications. The chapter reviews research on the clinical applications of mindfulness and explains the methodological challenges involved, before identifying the importance of future research to help us identify when to use and when to avoid the use of mindfulness and meditation practices with clinical populations.

Vidyamala Burch has spent 20 years managing her pain through using meditation and mindfulness. She set up Breathworks in 2001 to ensure the learning from research on meditation and pain management and her own experience could be communicated to others. Chapter 7 explores the physiology of pain and the psychological burden before showing how meditation and mind/heart training can help. The chapter reviews relevant research and provides a description of the approach used by Breathworks—Mindfulness Based Pain Management—to manage pain.

The application of meditation in another therapeutic context is addressed in Chapter 8 by Sarah Bowen, Assistant Professor of Psychology at Pacific University, Oregon, and her colleagues. They describe the use of meditation in the "cyclical trappings and anguish caused by addictive behaviors." Their chapter addresses the nature of addiction and the role of mindfulness and meditation in

addictive behaviors. They review the use of mindfulness-based relapse prevention, acceptance and commitment therapy, and dialectical behavior therapy, and present encouraging evidence for the effects of these meditation and mindfulness-based approaches in the treatment of drug addiction, eating disorders, and smoking.

In Chapter 9, Linda Carlson, Enbridge Research Chair in Psychosocial Oncology at the University of Calgary, Canada, provides a review of research on meditation training for people living with a variety of chronic medical conditions, including cancer, chronic pain conditions, fibromyalgia, cardiovascular disease, diabetes, irritable bowel syndrome, HIV/AIDS, rheumatoid arthritis, and organ transplant. The chapter describes the challenges of living with chronic or life-threatening illnesses and explores why meditation and mindfulness-based interventions might help. The chapter then reviews key research studies and concludes that mindfulness-based interventions hold real promise for relieving suffering amongst those with chronic diseases.

The final chapter in Part 2, by Antonino Raffone, offers a neuroscience perspective on meditation. Antonino is Associate Professor of Psychology at the Sapienza University of Rome and, in Chapter 10, he provides an overview of the neural correlates of meditation. He shows how emerging research on neuroplasticity (the hitherto ill-understood capacity of the brain to continually adapt over the life-span) helps us to understand how meditation practice changes brain functioning, consciousness, and awareness. This reinforces research findings suggesting structural changes in human experience as a result of meditation practice. He distinguishes between focused attention types of meditation and "opening up" meditation and shows that there are distinct neurophysiological processes associated with each, with consequent implications for our understanding of the effects of these different styles of meditation.

Part 3 explores the application of meditation in the workplace and in school. Bond and colleagues in Chapter 11 discuss how acceptance and commitment therapy (ACT) conceptualizes mindfulness and show how ACT can be used to promote mental health and behavioral effectiveness at work. They focus on the key construct in ACT of psychological flexibility, which results from mindfulness. The chapter reviews research on the influence of ACT on employee mental health, innovativeness, emotional burnout, and attitudes toward client groups. The chapter describes in detail the approach the authors use to enhance well-being at work using ACT and, in particular, mindfulness.

Chapter 12 by Katherine Weare, Emeritus Professor at the School of Education, University of Southampton in the UK, describes how meditation and mindfulness are being deployed in school settings. In this chapter, she explains the major growth of interest in the use of mindfulness for children and young

people and explores ways in which mindfulness is developing in interventions for children and adults in education in the UK and internationally. The chapter assesses the evidence base for mindfulness practice in schools and describes associated impacts and outcomes in relation to mental health problems, well-being, and learning. The chapter suggests a long-term vision of mindfulness at the heart of a whole school approach to the education of both the hearts and minds of young people.

Part 4 offers two sets of conclusions. In Chapter 13, Peter Sedlmeier and colleagues from the Technische Universität of Chemnitz, Germany, review research on the psychology of meditation. They conclude that though great progress has been made and results in many domains are very positive in indicating beneficial effects of meditation practice, future research must offer more powerful insights. They propose that research should be more comprehensive in approach rather than narrow and fractionated; that there is great value in adopting Eastern philosophical and spiritual perspectives to guide research designs; and that there is great value in researchers co-designing research with those people who have considerable experience of practicing meditation and of using single case study designs to study such people. Finally, in Chapter 14, I offer insights based on a synthesis of the core messages to emerge from this volume and assess the extent to which we, as contributors, have answered these questions:

◆ What is meditation and how can we understand this practice or experience from a psychological perspective?

◆ What are the key psychological processes involved in shaping experience and outcomes from meditation practice?

◆ What does the research evidence tell us are the potential therapeutic/clinical applications of meditation?

◆ How might meditation be more broadly applied in society to the benefit of human communities?

◆ What can we conclude overall in terms of our understanding of meditation from research and practice to date?

◆ And where next for those seeking to understand meditation and mindfulness?

Before we begin the journey of discovery in relation to these questions, one other aspect of the book is worthy of the reader's attention. All of the contributors have practiced meditation—some of them for more than 40 years—and they offer a considerable amount of experience of practice of many different methods and traditions. Each has written a brief account of their own experience with meditation, offering a fascinating glimpse of the range of experiences

and meanings they have derived. This book therefore contains the main content of chapters on meditation research and practice, an account of the contributors' own experience, and an implicit body of knowledge based on the many years of practice in aggregate of those who have contributed to the book.

Personal Meditation Journey

When a friend talked of learning meditation in my first year at university, my reaction was immediate and unequivocally positive. The idea of focusing on and exploring the mind in order to find peace was compelling. I was instructed and told my mantra by a TM instructor in rooms above a butcher's shop in Pimlico, London in 1971. Two years later, my undergraduate psychology research dissertation focused on skin resistance during meditation and comparison conditions. I completed a Ph.D. on the psychology of meditation in 1977, publishing a number of research papers over subsequent years. The practice of meditation was an anchor in my troubled seas during those years when I went from student to coal miner to university researcher and father. I practiced with varying regularity out of both a faith in the practice and because the "still complete-ness" of the meditation was both refuge and stability.

There was an enriching shift in 1984. A group of psychologists with a shared interest in Buddhism and meditation formed, including John Crook and David Fontana (sadly, both have died), Guy Claxton (a dear friend since), and Sue Blackmore (a leading conscious-ness explorer in the UK). We met regularly for weekend retreats in John's primitive farmhouse, Maen Llwyd, in wild mid-Wales—now a center for Western Chan Fellow-ship, which follows John's teachings. There I began to practice zazen ("just sitting") for hours, relishing the clear simplicity and directness of the practice. This pure awareness sitting remains the mainstay of my practice.

The group staged a wonderful conference on Eastern Approaches to Mind and Self in 1986 at the University of Wales, attended by both inspirational academics and teachers from a variety of meditative traditions. And the following year, I edited, and Oxford Uni-versity Press published, *The Psychology of Meditation*—the precursor to this volume. Over the following three years, I attended diverse retreats at Tibetan Buddhist centers in the UK and France. In a time of personal turbulence, the practice again provided both challenge and refuge.

For the next 20 years, I practiced meditation with varying degrees of commitment over the course of a busy career, rich family life, and extensive travelling. Meditation is now core to my days. And for the last eight years, I have practiced more regularly, for an hour or more a day. Sometimes this is in separate sittings of 30 or 40 minutes, and sometimes sitting by

the pond in my garden for an hour at a time. I sit in meditation on train journeys and on flights—both valuable opportunities to practice without taking time away from others. I have occasionally augmented my meditation practice with what Buddhists call *Tonglen* or with *mettā bhāvanā*; both practices of developing compassion for self and others that develop new dimensions to relationships with others and also with myself. Just sitting to cultivate a pure awareness of nowness is the content of my practice at present, along with a gently growing mindfulness, unforced, in daily life of the breadth and immediacy of our existence. Gradually, my awareness has become clearer—of my wild mind, the wayward and depleting journeys of thoughts, of the drive to plan continually, of circular concerns with impression management, and of the constant impulse to entertain the mind.

And awareness of awareness itself has subtly changed the hue of mind and experience. Gradually, ever so slightly, more and more, changing the experience of mind and of awareness. Clearer, lighter, peaceful, contented, tender, and more and more open. And gradually, slightly, but more and more, changing my need to grasp at social approval, to continually find ways to entertain the mind, to judge others, to feel angry, to fuel fear, to pursue success and to be depleted rather than enriched by moments. Awareness of thoughts, impulses, and the underlying rationale for them has become clearer. And the ability to focus in an uncontrived way on the present moment has become stronger, simpler, more stable, and easier. I have experienced too a growing sense of huge privilege in life. Gratitude for the many benefits, opportunities, friends, family, and life itself has deepened considerably.

Having the capacity and the knowledge to practice meditation and to strengthen my practice each day is a precious gift. And I am deeply curious to discover where the journey goes—its landscapes, way stations, and new vistas (editing this book is a station on that journey too). This meditation journey has no destination—the journey is the destination.

Acknowledgment

References

Benson, H. (1975). *The relaxation response*. New York, NY: Morrow & Co.

Benson, H., Beary, J. F., and Carol, M. P. (1974). The relaxation response. *Psychiatry*, **37**, 37–46.

Bishop, S. R., Lau, M., Shapiro, S. et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, **11**, 230–241.

Bowen, S., Witkiewitz, K., Dillworth, T. M. et al. (2006). Mindfulness, meditation and substance use in an incarcerated population. *Psychology of Addictive Behaviors*, **20**, 343.

Brewer, J. A., Sinha, R., Chen, J. A. et al. (2009). Mindfulness training and stress reactivity in substance abuse: Results from a randomized, controlled stage I pilot study. *Substance Abuse*, **30**, 306–317.

Brotto, L. A. and Smith, K. B. (2014). Applications of mindfulness in the treatment of women's sexual dysfunction. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 864–880. Chichester, England: John Wiley & Sons.

Brown, D. P. and Engler, J. (1980). The stages of mindfulness meditation: A validation study. *Journal of Transpersonal Psychology*, **12**, 143–192.

Butler, C. (1922). *Western mysticism*. London: Constable.

Coleman, F. E. (1971). *The quiet mind*. London: Rider and Co.

Crum, A. and Lyddy, C. (2014). De-stressing stress: The power of mindsets and the art of stressing mindfully. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 948–963. Chichester, England: John Wiley and Sons.

French, R. (1968). *The way of a pilgrim*. New York, NY: Seabury Press.

Freuchen, P. (1959). *The book of the Eskimoes*. New York, NY: Fawcett.

Germer, C. K., Siegel, R. D., and Fulton, P.R. (Eds.). (2005). *Mindfulness and psychotherapy*. New York, NY: Guilford Press.

Goleman, D. (1977). *The varieties of the meditative experience*. New York, NY: E. P. Dutton.

Halevi, Z'ev Ben Shimon (1976). *The way of Kabbalah*. New York, NY: Samuel Weiser.

Hewitt, J. (1978). *Meditation*. London: Hodder & Stoughton.

Hogan, M. (2014). Mindful health and the power of possibility. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 563–583. Chichester, England: John Wiley & Sons.

Ie, A., Ngnoumen, C. T., and Langer, E. J. (Eds.). (2014a). *The Wiley Blackwell handbook of mindfulness,* Volume 1. Chichester, England: John Wiley & Sons.

Ie, A., Ngnoumen, C. T., and Langer, E. J. (Eds.). (2014b). *The Wiley Blackwell handbook of mindfulness*, Volume 11. Chichester, England: John Wiley & Sons.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, **4**, 33–47.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your mind and body to face stress, pain, and illness*. New York, NY: Dell.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, **10**, 144–156.

Kabat-Zinn, J. (2005). *Coming to our senses*. New York, NY: Hyperion.

Kabat-Zinn, J., Lipworth, L., and Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, **8**, 163–190.

Kabat-Zinn, J., Massion, A. O., Kristeller, J. et al. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry*, **149**, 936–943.

Kadloubovsky, E. and Palmer, G. E. H. (1969). *Early fathers from the Philokalia*. London: Faber and Faber.

Katz, R. (1973). Education for transcendence: Lessons from the Kung Zhu/Twasi. *Journal of Transpersonal Psychology*, **5**, 136–155.

Katz, R. (1999). *The straight path of the spirit: Ancestral wisdom and healing traditions in Fiji*. Santa Fe, NM: Inner Traditions/Bear & Co.

Krishnamurti, J. (1987). *The awakening of intelligence*. Delhi, India: Penguin Books.

Kristeller, J. L. and Epel, E. (2014). Mindful eating and mindless eating: The science and the practice. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 913–933. Chichester, England: John Wiley & Sons.

McCracken, L. M. (2014). Acceptance and commitment therapy and mindfulness: Specific processes, evidence, and methods. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 705–718. Chichester, England: Wiley Blackwell.

Merton, T. (1960). *The wisdom of the desert*. New York, NY: New Directions.

Naranjo, C. (1974). The domain of meditation. In J. White (Ed.). *What is meditation?* pp. 27–36. New York, NY: Anchor Books.

Naranjo, C. and Ornstein, R. E. (1971). *On the psychology of meditation*. New York, NY: Viking Press.

Nicholson, R. A. (1914). *The mystics of Islam*. London: Routledge/Kegan Paul.

Ornstein, R. E. (1972). *The psychology of consciousness*. San Francisco, CA: W. H. Freeman and Co.

Osuna, Fray F. de (1931). *The third spiritual alphabet*. London: Benziger.

Phillips, D. and Pagnini, F. (2014). A mindful approach to chronic illness. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 852–863. Chichester, England: John Wiley & Sons.

Progoff, I. (Ed.) (1969). *The cloud of unknowing*. New York, NY: Julian Press.

Rahula, W. (1959). *What the Buddha taught*. New York, NY: Grove Press.

Ross, N. W. (1981). *Buddhism, a way of life and thought*. London: Vintage.

Shapiro, D. H. (1982). Overview: Clinical and physiological comparisons of meditation with other self-control strategies. *American Journal of Psychiatry*, **139**, 267–274.

Spurgeon, C. (1970). *Mysticism in English literature*. Port Washington: Kenikat Press.

Teasdale, J. D., Segal, Z. V., Williams, J. M. G. et al. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, **68**(4), 615.

Wahbeh, H. (2014). Mindfulness meditation for posttraumatic stress disorder. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 776–793. Chichester, England: John Wiley & Sons.

Watts, A. W. (1957). *The way of Zen*. Harmondsworth, Middlesex, England: Penguin.

Welwood, J. (1982). The unfolding experience: Psychotherapy and beyond. *Journal of Humanistic Psychology*, **22**, 91–104.

West, M. A. (1986). Meditation: Psychology and human experience. In G. Claxton (Ed.). *Beyond therapy: The impact of Eastern religions on psychological theory and practice*, pp. 243–286. London: Wisdom.

West, M. A. (Ed.) (1987). *The psychology of meditation*. Oxford: Oxford University Press.

White, F. (Ed.) (1974). *What is meditation?* New York, NY: Anchor.

Woodruff, S. C., Arnkoff, D. B., Glass, C. R., and Hindman, R. K. (2014). Mindfulness and anxiety. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 732–754. Chichester, England: John Wiley & Sons.

Yogi, M. (1995). *Science of being and art of living: Transcendental meditation*. London: Meridian.

Zilcha-Mano, S. (2014).The effects of mindfulness-based interventions during pregnancy on birth outcomes and the mother's physical and mental health: Integrating Western and Eastern perspectives. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, Volume 11, pp. 881–897. Chichester, England: John Wiley & Sons.

Meditation: Practice and experience

Martine Batchelor

Introduction

In this chapter the fundamentals of meditation and their relevance to well-being are described. It is proposed that the basis of Buddhist meditation lies in a combination of concentration and enquiry, regardless of the way in which they are cultivated in different Buddhist traditions. If one considers a certain technique of meditation better than any other due to conceptual or theological convictions, there is the danger of ignoring other techniques that could be useful for some people. By starting from the universal basis of concentration and enquiry, we can see how meditation works across practices and traditions. This chapter explores and explains how being mindful of the breath or asking a question can have a profound effect on people.

The chapter addresses the question: What happens when we meditate? In order to answer this question, it presents the basic principles of concentration and enquiry in reference to different techniques of meditation. The chapter broadens the view to place these two main elements in terms of simple Buddhist psychology. It refines the definitions of concentration as anchoring and of enquiry as experiential and, in doing so, offers a detailed description of mindfulness. It proposes that creative awareness or mindfulness arises from the cultivation of concentration and enquiry.

The chapter concludes by using the framework of concentration and enquiry to examine three types of meditation—listening meditation, mindfulness of feeling tones, and questioning meditation. This analysis demonstrates the applicability and advantages of the framework for understanding the psychological benefits of meditation.

The basis of meditation: concentration and enquiry

From an early age I had been concerned by the state of society, its competitiveness and lack of peace and harmony. Then I was struck by a passage in a

Buddhist text where the Buddha suggested that if you could not change yourself, you would not be able to change others. Thus, aged 18, I decided to transform my mind but did not succeed. I found that wishing it idealistically or trying to do this rationally did not seem to make any difference. I could say to myself repeatedly: Do not be egotistical! Do not be jealous! This had no effect on my feelings or behavior. Finally, at the age of 22, I decided to try meditation, becoming a nun in a Korean *Seon* (Zen) monastery and meditating ten hours a day for three months at a time. For the first three months I did not see immediate differences but after the second three months I started to become more self-aware of my thoughts in a beneficial way and to be more compassionate by thinking of others before myself. This happened while meditating using a questioning practice as taught in the Korean *Seon* tradition. After I left Korea and the monastic life, I encountered mindfulness practices and understood that the common basis of most Buddhist meditation practices was a combination of concentration and enquiry, also known in *Pali* (early Buddhist language in which ancient Buddhist texts were memorized and then written) terms as *samatha* and *vipassana*.

In Korean *Seon questioning meditation* one asks repeatedly "What is this?" Concentration is cultivated by returning to the question again and again, and enquiry by asking the question vividly. This means that as one sits in meditation, one asks the question "What is this?" in a questioning way (not like a mantra) as a means to developing a sensation of questioning in the whole body–mind complex (a full explanation of this practice is given in the section on "Meditative questioning").

In *analytical meditation* in Tibetan Buddhism, the meditator can focus on a theme like death by returning to this subject throughout the length of the meditation, and enquires by reflecting experientially on two aspects of death—that death is certain and that the time of death is uncertain. Based upon these two facts, the meditator considers what are the most important things to do now?

In *visualizing meditation*, also found in the Tibetan tradition, concentration is developed by visualizing a three-dimensional image of a Buddha and enquiry by seeing oneself as having the quality of the Buddha residing in the center of that image. This can be seen as representing enquiry because if the meditator sees herself as having the same compassion as the Buddha, it leads her to question the way she feels when she is not loving or compassionate. The meditator challenges the assumption that her compassion is limited by opening her mind to the idea that she could have as much compassion as a Buddha.

In *mindfulness practice* the meditator takes as a focus an element of his or her own experience—either the breath, physical sensations, sounds, feeling tones, or thoughts. Enquiry is cultivated by looking deeply into the impermanent and conditioned nature of the breath, physical sensations, sounds, etc.

There are spectra of both concentration and enquiry in the meditative traditions. Some meditation techniques emphasize a narrow focus and others advocate no focus such as "sky gazing" in the Tibetan tradition or just sitting with no object of attention as in the Soto Zen tradition. With a narrow focus, tension can arise; with no focus the attention can become vague. A medium focus provides something in the foreground to anchor our attention (such as the breath, taking sounds as an object of attention, or the question "What is this?") and enables a wide-open awareness in the background so that the mind is not constricted.

In relation to the enquiry component, the orientation depends on the philosophical position the technique is derived from. Is the practitioner looking for transcendence beyond conditions, as in trying to experience or return to primordial consciousness or original mind? Or does the meditator see herself as embedded in a network of conditions that she is trying to understand in order to determine their influence on her and how she could respond to these conditions differently? This chapter considers principally the second point of view, as it is more relevant to psychological well-being and has greater applicability to daily life.

If concentration and enquiry are common elements to many different Buddhist meditation practices, how do they work psychologically? What are their impacts on one's state of mind? Before answering these questions, we need to widen the perspective and look at the Buddhist psychological frame of reference and associated definition of terms.

Definition of the foundations of consciousness from a Buddhist perspective

In *The Connected Discourses of the Buddha* as translated by Bodhi (2000, p. 602), it is stated:

> Then, monks, it occurred to me: "When what exists does consciousness come to be? By what is consciousness conditioned?" Then, monks, through careful attention, there took place in me a breakthrough by wisdom: "When there is name-and-form, consciousness comes to be; consciousness has name-and-form as its condition."

In this quote, the Buddha posits that consciousness (*Pali: vinnana*) is an emergent property of name-and-form (*Pali: namarupa*). Name-and-form was used in the pre-Buddhist Upanishads to denote the multiplicity of the world that sprang from the unity of Brahman (God). In the early Buddhist tradition it was used to refer to the material and mental conditions that generated consciousness. "Form" (as in form and matter) refers to the material world that impacts the senses; "name" refers to the primary mental processes triggered by our moment-to-moment encounters with the world.

"Name" is constituted by five elements—contact, feeling, perception, intention, and attention. Contact refers to the initial impact of the world on one of the six sense organs. Feeling is the experience of that impact as pleasurable, painful, or neutral. Perception is that which identifies the object as this object rather than that object (e.g., a cat versus a jug) by differentiation. Intention is our movement toward and engagement with the world (as well as our recoiling and disengaging from it). Attention is that which apprehends and focuses on an object. These are seen as the foundations of consciousness. Asanga (Buddhist scholar, possibly fourth century) postulated that when these are compounded with the five "determining" functions, which are aspiration, mindfulness, appreciation, concentration, and intelligence in meditation, over time psychological well-being can arise.

This framework suggests that we have all these five abilities required to meditate. People often complain that they cannot sustain attention or concentrate in general or in meditation. However, often it is because they try too hard to pay attention (to concentrate too much), for example when they become obsessed by one person, one idea, or one situation and cannot think of anything else. In meditation we are trying to cultivate the ability to pay attention in a directed manner and in a way that allows stability and calm to arise.

Intention is another important capacity. Good intentions seem to have little power when our repeated New Year resolutions of eating less, not smoking, or doing more exercise fail. However, the ability to intend something in meditation sets up a direction that can be quite powerful and create change over time (as related research in psychology shows—for example Gollwitzer and Sheeran 2006). I could decide to just sit and do nothing, and my mind would simply be in its un-restful resting state. Or I could decide to be aware of my thoughts and suddenly there is no thought as I try to look at them. Or I could have the intention to be aware of my feeling of stress every time I am late and I could learn to become less stressed as a result of increasing my awareness of the conditions that lead to stress, enabling me to change them. Once I started to notice that whenever I would try to catch a bus when teaching in Rome I would become irritable. Then I decided to set the intention to be aware of my feelings when trying to take a bus. This enabled me to become more aware of the moment when I would move from being calm to becoming fretful. Thus, I became more mindful of my relationship with catching transport in general and on many occasions this intentional awareness then diminished the rushing and the irritability.

Perception is about meaning. We are meaning-making machines; things, events, and people need to make sense to us. Meditation helps us to see this process more clearly and dissolve the negative automaticity of much of it. Awareness of negative reactions to people, events, sounds, places, etc. helps us to let go of

those reactions rather than being driven by them. Contact is where our reactions begin and feelings influence us to react in a particular way (angrily, happily etc.). Mindfulness is key in enabling us to come to see how all of this happens.

Now we can return to the two components of meditation—concentration and enquiry—with the recognition that these innate abilities can be honed during meditation.

Concentration: focusing and anchoring

Meditation aims to develop a specific type of concentration—it is focusing and anchoring but not tensing. The idea is to stabilize and calm the mind. In every-day life, either our attention wanders a lot or we can be too focused on one thing (for example when we become obsessed with a perceived slight from a friend).

If we sit in meditation and try to be aware of the breath, quickly we think of something else. The focusing in meditation is not to stop the thoughts but to develop a different relationship to them. So, we pay attention to the breath and then our attention wanders away. It is the focus on the breath and the intention to focus on the breath that bring us back again and again to the experience of breathing. Each time we come back to the breath we are avoiding reinforcing our habitual patterns of thinking and at the same time we are diminishing their power of automatism or "stickiness" ("stickiness" refers to our tendency to be trapped by particular trains of thought). Thus, with practice, thoughts revert to their creative functions of thinking, reflecting, imagining, planning, or judging.

Warren (2013) describes the preliminary results of a recent experiment using fMRI undertaken by Dave Vago, a neuroscientist, and Shinzen Young, a meditation teacher, at Brigham and Women's Hospital and Harvard Medical School in Boston. They were researching the "real" resting state of the brain, which scientists have shown is actually quite active. The experiment focused on meditation practitioners, with meditation experience ranging from a few years to more than 20 years. They found that the veteran meditators could achieve a "real" resting state well but not a contrasting non-resting state, where they were asked to let their minds freely wander. They had trained their minds not to ruminate and worry and, though they could still think, their thoughts had a different feel, "an un-fixated quality," as Warren described it.

This FRMI experiment reveals different levels of thinking. One level is fairly automatic and has a lot to do with self-referencing. This is what shocked me most when for the first time I saw what was in my mind, that it was all so self-referential and repetitive. This is the level that disappears over time when meditating. Then we are not left with an empty mind but a better functioning mind. If we want to imagine something, or reflect on some subject, or plan

some new organizational process, we can but not in an obsessive manner. We also realize that a calmer mind leads to a more creative mind. As the mind is less occupied with self-referencing, it is more present to respond creatively to the environment. This is why people on retreats often report thinking and listening more creatively. Taking listening as an example, we can listen in different ways. We listen but we are actually waiting for the person to stop so that we can say something so much more interesting. Or we look in the right direction but are actually thinking of something else, so that when the person stops and asks us: "What do you think?" We have no idea what they have said. Or we listen and overreact to what we hear and amplify what the person is saying. However, if we listen with creative awareness, we are listening 100%, totally focused on what the person says, as well as bringing an element of curiosity and bright attention. Thus, when the person stops, what we say is appropriate and relevant to the moment and that conversation. What one says is something unique, some words, reflections, or suggestions one has never thought or said before. It is creative awareness in action, creating space and relevance, and at the same time grounded in the wisdom and compassion developed over time. In summary, creative awareness is the honing and manifesting of potential capacities and abilities, unhampered by fixations around self and others.

Often people think meditation is about having no thoughts at all but concentration enables the thought process to return to its innate creative functioning without the automatism or the "stickiness" that characterizes much thought activity. In this way the mind can become more spacious, like a room with less furniture. It is easier to be stable and calm when the nervous system is less agitated as a result of our reducing continuous rumination and worrying.

Another aspect of this concentration is that when we come back to the breath, we do not just come back to the breath but also to the whole moment. Instead of being lost in abstractions (what happened in the past or what might happen in the future) we are present to the breath in the foreground and, in parallel, with the background—with its sounds, physical sensations, feeling-sensations, etc. The more we experience this, the more we start to develop a wider sense of our identity. Imagine that for five minutes we are thinking about something negative in our past. It will feel as if we are back there and consequently we bring the negative feelings into the present. But if after one minute we come back to the breath and are mindful that right now everything is still, calm, complete, and positive, we feel fine, as a result of being more in that current reality. Even if a minute later we think again about the past, we can come back again and so not stay long enough to fix our current identity in that past negative experience. The more we come back to the breath and a multi-perspectived experience of ourselves, the less we fixate on single trains of thought, single physical sensations, or

single meanings of emotions and the stories that could be associated with them in the past and future. Our identity is less dictated by these memories of the past and more determined by a range of present-moment experiences and particularly the now of breath in meditation.

When we try to concentrate in meditation, we are not taking the orientation that we would have if we did this in everyday life. Generally concentration is associated with narrowing the focus and tensing the body and mind, which would have the opposite effect of what we are trying to develop in meditation. Here we are trying to rest the attention on an object in our experience (such as the breath) and use it like the anchor of a boat. The anchor is there to ensure that the boat does not drift away but the boat is not motionless. It is the same in meditation. We are not trying to stop thinking, feeling, or sensing. To think, feel, and sense are necessary, fundamental, and inevitable human functions. We are trying to develop a different relationship to them by using the breath as an anchor to ensure that our thoughts do not carry us too far away from the present moment. As in the experiment described above, the veteran meditators in the FMRI machine could think and be conscious ("there is noise right now") but without the need to do anything with it. The thought arose and passed away without leading to commentary, anxiety, or self-doubt.

We achieve this by sitting still in meditation with the intention to use the breath as an anchor, in a comfortable posture on a cushion on the floor or on a chair, with an upright but relaxed posture. We try to relax the shoulders and jaws, and also the way we use our mind to meditate. It is called "effortless effort" in the Zen tradition. It is compared to tuning a guitar's strings, not too tight, nor too loose. So in this instance we are using the ability we have to pay attention in a way that does not make us exclude anything nor bring tension. To cultivate such a balanced, poised concentration, we need to see the difference between aspiration and expectation. Aspiration toward positive changes helps by giving us energy and an open-ended, clear intention when we try to concentrate. Expectations limit us to what we know and want immediately, bringing judgments and comparisons, and thus often tension and frustrations, which detract from a stable and still focus.

Experiential enquiry

The Buddhist term for experiential enquiry is *vipassana*. It is defined thus by Analayo (2009, p. 672)

> *Vipassana* and the corresponding word *vipassati* stand for the development of a form of vision that sees, "*passati*," in an intensified and also analytical manner, *vi-*, hence *vipassana* stands for "insight" . . . The basis for growing insight into the true nature of

existence is penetrative awareness of its impermanence and therewith conditioned nature . . . Such comprehensive seeing with insight will ensure that the entire gamut of what is usually experienced as "I" and "mine" is instead seen with insight as a product of conditions and subject to change and alteration . . . Whereas in the thought world of the early discourse *vipassana* stands for a quality to be developed, in modern day usage *vipassana* represents mostly a particular form of meditation . . .

The early usage of the term implied a quality to be developed. Concentration alone will not give us the means to transform ourselves. It can make us feel better, in that we will feel more stable and calm if we cultivate meditative concentration in a balanced way, but another quality is needed for radical transformation. That is the quality that uses the mind's capacity to question and to look deeply into our experiences to see what is happening instead of submerging into commenting and ruminations.

We have a tendency to generalize—or even *permanentize*. When something happens, especially something negative, we extrapolate that "it has always been like this and always will be." For example, we may feel tongue-tied in a social situation and then "permanentize" this experience in relation to expectations of sociability in future situations, rendering us even less capable of engaging positively, comfortably, and openly with others. This fixes the experience in a permanent and negative way. The Buddha emphasized exploring with mindfulness our experience and knowing for ourselves that things, events, and sensations change, in order to counteract that tendency to generalize, fix, and thereby limit our experience.

In the Tibetan tradition *vipassana* is seen more as analytic meditation; in the Zen tradition as a question or a non-grasping attitude; and in early Buddhism it is connected to the experiential understanding of change, unreliability, unsatisfactoriness, pain, not-self, and conditionality. I am going to explore change and conditionality here, again because this is relevant particularly to a psychological understanding of meditation processes.

Experiential enquiry enables us to be more in accordance with what is happening as it occurs and to develop a processual awareness. Research has shown that for most people the resting state of the brain is not restful. We spend a lot of our time working in our heads. Experiential enquiry aims to make us more aware of our body, our senses, and the impact of the environment on our senses and to experience for ourselves how long things last. We can ask: "How long is this (sensation, feeling, sound, or situation) going to last?" (e.g., how long is this feeling of anger/fear going to last?). If we do not do anything with it and it goes by itself, we do not need to do more with it. If it repeats itself, we need to pay more attention to what gave rise to it. What was the trigger? What were the conditions? What were the contributory factors such as stress, sleeplessness, or

tiredness? For example, I used to be irritable when I was tired. When I discovered that mechanism through experiential enquiry, I started to rest more when tired and thus became less irritable. If the intensity continues, then it means that something happened that was shocking or frustrating, for example, and we need to find a way to address the situation. Enquiry thus enables us to be both more aware of and to have more choice over our experiences.

Experiential enquiry can also enable us to go into the experience itself and show us that this too is changing. There are momentary changes as sensations arise and pass away and there are organic changes when sensations or sounds are changing. When I experience physical pain, if I go inside the experience to the specific part of the body where it resides, I can see that it is not fixed and solid but that it fluctuates; it ebbs and flows. It is not exactly the same all the time. When one is aware of this, the pain still exists but it seems to be a more diffuse sensation than an attack on well-being. It is then easier to relate to it in a non-reactive, non-intensifying way.

At a simpler level, take the experience of an itch on the cheek. You sit still in meditation and suddenly you feel this itch. It is so itchy that you have the impression that it is going to be itchy and almost unbearable like this forever; it is that intense. You do not scratch it, however, and wait to see how long it is going to last. And then as suddenly as it came, it is totally gone. It is so gone, it is as if it was never there. Experiential enquiry helps us to become more familiar with this phenomenon that something can be so there and then so not there. And we can know for ourselves that things do change and this in itself can be quite transformative, as we no longer assume immediately that things will always stay the same.

Experiential enquiry brings brightness and clarity to the meditation at the same time that we are developing calm and stability with the steady development of concentration. The two together seem to produce a different kind of awareness that I call "creative awareness." This awareness does not make us radar-like, fixedly staring at reality, but more easily living in our moment-to-moment conditions in the present and creatively engaging with them. I see the cultivation of these two abilities together—concentration and enquiry—as dissolving the rigid framework of our habits and patterns to enable them to return to their original helpful functions and creative usages.

Creative awareness as meditative mindfulness

Sati is the *Pali* term that was translated as "mindfulness" by early Buddhist scholar T. W. Rhys Davids (1843–1922). This general term "mindfulness" has a broad range of meaning, though nowadays it has become understood as

"present-centered and non-judgmental" awareness. However, the Buddhist scholar Dreyfus (2013, p. 47) questions this definition:

> Mindfulness is then not the present-centered non-judgmental awareness of an object but the paying close attention to an object, leading to the retention of the data so as to make sense of the information delivered by our cognitive apparatus. Thus, far from being limited to the present and to a mere refraining from passing judgment, mindfulness is a cognitive activity closely connected to memory, particularly to working memory, the ability to keep relevant information active so that it can be integrated within meaningful patterns and used for directed goal activities (Jha et al. 2010). By paying close attention, practitioners of mindfulness strengthen their cognitive control because they increase their ability to retain information and thus see their true significance rather than being carried away by their reactions.

The original meaning of *sati* was to remember. For example, one finds this quote in *The Middle Length Discourses of the Buddha* as translated by Bodhi (Bodhi and Nanamoli 1995, p. 463):

> He has mindfulness; he possesses the highest mindfulness and skill; he recalls and recollects what was done long ago and spoken long ago.

This aspect of mindfulness is useful when trying to come back to the object of concentration and remember our intention to be aware of the breath. But *sati* is also seen as bringing a wider perspective and balance. In the *Lohicca sutta* found in *The Connected Discourses of the Buddha* (Bodhi 2000, pp. 1203–1204) it is said: "He dwells without having set up mindfulness of the body, with a limited mind . . . He dwells having set up mindfulness of the body, with a measureless mind." As Analayo points out in his definition of *sati* in *The Encyclopaedia of Buddhism* (2007, p. 8): "It represents the ability to simultaneously maintain in one's mind the various elements and facets of a particular situation." In another text, mindfulness is compared to a watchful charioteer, who can survey the road and the surroundings from a higher position and at the same time holds the reins of his horses in a balanced manner.

Analayo (2007, p. 8) makes an interesting connection between *sati* and attention, one of the constituents of the mind, in his entry on *sati* in *The Encyclopaedia of Buddhism*:

> Sati can be understood as a further development of this type of attention, thereby adding clarity and depth to the usually much too short fraction of time occupied by bare attention in the perceptual process.

Mindfulness therefore serves different functions. It is at the same time something to cultivate, the effect of that cultivation, and the tool used to cultivate it. To meditate we need to remember to focus on the object of meditation and also to look deeply into the experience. This enables us to be mindful and this allows

us to be aware of what is happening in this moment. This in turn enables us to creatively engage with what is happening in the moment and to transform our relationship to it.

Thus mindfulness can be at different times recollected intention, presence of mind, or creative awareness. One of its functions is to make things that are arising truly conscious. Mindfulness has to be balanced—neither repression nor proliferation of sensation or experience. In a meditative context it is also being caring and careful in relation to experience. Finally, meditative mindfulness is based on ethical discernment. It helps us to be aware of actions, thoughts, and intentions and to answer such questions as: Is this wholesome or unwholesome? Is this beneficial for myself and others, or not? Does this bring pain or not? It is fundamentally about the causes and conditions of suffering.

Mindfulness thus enables us to become more attentive and alert, but also careful and caring. It also has a probing quality like a doctor delineating a wound, a simile used in early texts. Another simile is that of a ploughman, where mindfulness is compared to a ploughshare and a goad. The ploughshare reveals by digging and the goad serves to keep the cows in the proper direction to make a straight furrow. Moreover, the ploughman needs to use the right pressure on the plough so that it is not too heavy or too light.

Tools of creative awareness

In this section we explore how the two qualities of concentration and enquiry can be cultivated with different methods. Meditation methods are tools serving us in different contexts rather than ends in themselves or even methods for creating certain states while one is meditating. The value of meditation tools and creative awareness resides in helping us to cultivate our potential, to deal with difficulties, and to have meaning in our daily life. We will examine three ways (listening, mindfulness of feeling tones, and questioning) in which one can meditate, to demonstrate the application of the model of concentration and enquiry and also the multi-perspective approach of developing creative awareness.

Listening

Listening meditation is an effective method for people who have difficulty with mindfulness of the breath or the body, and also for people who are sensitive to noises. The specificity of this meditation is that the focus is much wider than with many other meditation practices and the focus is outside of oneself. In this exercise one just listens to whatever sounds arise and pass away. It is like

listening to the famous piece of music composed by John Cage called *4'33"*, which is silent and where one hears the music of life at that moment. Artist Irwin Kremen (1994), to whom John Cage gave this piece for his birthday, has this to say about the musical score that was dedicated to him:

> In this score, John made exact, rather than relative, duration the only musical characteristic. In effect, real time is here the fundamental dimension of music, its very ground. And where time is primary, change, process itself, defines the nature of things. That aptly describes the silent piece—an unfixed flux of sounds through time, a flux from performance to performance.

When one listens meditatively, one does not comment on, identify, or grasp at the sounds one hears. One just listens mindfully as they arise and pass away. Or if they continue, one notices that they change within themselves. Listening is an easy way to cultivate *vipassana* or penetrative awareness as Analayo (2009) defines it. The idea is not to define or name the sounds or collect them in a tick list like spotting endangered birds. It is just to be aware of them as they come and go. If the conditions are quiet, then one can listen and rest in the silence that happens between the rare sounds occurring. This will enable us to develop receptivity without expectations as sounds arise in an unpredictable manner.

I would not recommend this meditation in a noiseless room if one has tinnitus, though outside in nature it could work. However, it can be useful for people who are sensitive to sounds and feel bombarded by noise, be they natural or industrial sounds. A person on one retreat felt that any sounds were "out to get her" and she would wear earplugs in the daytime to protect herself. She tried this sound meditation and it helped her to realize that sounds were impersonal and not designed to torment her. When sounds are not seen as enemies, the degree of hearing sensitivity diminishes. This, combined with the calming influence of the meditation, might lower the general level of sensitivity and thus calm the whole nervous system.

Listening meditation broadens our view of what we can concentrate on. Mindfulness does not refer only to what happens inside us; it must also be applied to events outside of ourselves. Moreover, when we listen it is easy to apply the experiential enquiry described above, as sounds continuously arise and pass away.

Mindfulness of feeling tones (Pali: vedana)

Mindfulness of feeling tones is a revelatory practice. The *Pali* term *vedana* refers to the hedonic tone of experience. Analayo (2009, p. 513) defines it in *the Encyclopaedia of Buddhism* as: "Feeling 'feels' in the sense that it feels such affective tones as pleasure, displeasure and hedonic neutrality." When we come into contact, through one of our six senses, with the environment and experience a

smell, a taste, a sight, a physical sensation, a sound, or a thought, is the experience pleasant, unpleasant, or neither pleasant nor unpleasant (which I will call neutral for short)? Brewer et al. (2012) distinguish between affective tone, feeling tone, and valence: "The valence of this affective tone is conditioned by associative memories that were formed from previous experiences."

Here I shall use the term "feeling tone" to refer to the tonality of our affective experience, rather like musical tones refer to musical sounds. Musical tones are qualified by their duration, pitch, intensity, and quality. It is the same with the feeling tones; they can be light, habitual, or intense. At any given moment we are assailed by numerous feeling tones coming from our senses, which are being impacted by the inner or outer world. It is important to see that feeling tones are constructed; they are not a given, they do not reside in the object we come into contact with. So, different people can experience different feeling tones when they come into contact with the same object, for example a painting or a piece of music. Moreover, they will be different according to our circumstances. When we are in a good mood, children's sounds can be experienced as pleasant; if you are exhausted they can be unpleasant.

Feeling tones arise quickly and have a profound impact on our behavior. Once I had an unpleasant experience and an hour later I found myself talking unpleasantly to my husband, who had nothing to do with the previous experience. Feeling tones, especially unpleasant ones, have a tendency to seep sideways and propagate in other things—people, situations, and objects from which they did not originate.

We can experience many feeling tones at any given moment, so in formal meditation it helps to narrow the focus of our attention to one of our senses in order to perceive feeling tones more clearly. Thus we can cultivate mindfulness of feeling tones in association with just one object of concentration. The meditator can be mindful of the breath, and then add one more element to this with an experiential focus led by the question "How does the sensation of the air in the nostrils feel?" Generally it will feel neutral and thus this meditation will enable the meditator to become more aware of this and other neutral feeling tones.

In *The Middle Length Discourses of the Buddha*, Bodhi (Bodhi and Nanamoli 1995, p. 401) translates a nun's teaching:

> Pleasant feeling is pleasant when it persists and painful when it changes. Painful feeling is painful when it persists and pleasant when it changes. Neither-painful-nor-pleasant feeling is pleasant when there is knowledge and painful when there is no knowledge.

We can have a conflicted relationship with neutral feeling tones, as they are generally associated with boredom. But if we consider them from a meditative perspective, they are restful (or at least nothing bad is happening). If there is a

neutral feeling tone, we can choose to know it fully and it can then become the source of a peaceful state of being in the moment. Or we can connote it negatively and even confabulate: "Nothing is happening . . . This is boring . . . I am bored . . . I am boring . . . Nothing works in my life!" Thus we can quickly go from neutral to unpleasant feeling tones. This is one of the challenges of formal meditation, especially sitting meditation, as most of the time nothing is happening and this can be experienced as boring. But if we know the peacefulness, clarity, and restfulness of a neutral feeling tone, we can know for ourselves quiet contentment both within and outside meditation.

When we meditate, we can become aware of unpleasant feeling tones. When we have a thought, this is a contact with a new object, which can produce a pleasant, unpleasant, or neutral feeling tone. Our thoughts have some trigger words, which lead to strong unpleasant feeling tones like "this is unfair," "this is wrong," "he does not respect me." The process proceeds from trigger words to unpleasant feeling tones to emotional upset. It can be difficult for us to notice or be mindful of the first contact with the trigger words that generated the feeling tone, and still less to observe how the feeling tone develops into more elaborated and magnified upset through our generation of looping stories and meanings. Physical sensations are clearer because as soon as we experience an unpleasant sensation, we are aware that we do not want it (this, of course, is a survival mechanism). The problem in reacting strongly to unpleasant feeling tones is that when we add to that experience by confabulation and "catastrophizing," we make it even more unpleasant. This is what the Buddha points out in the *Sallatha Sutta* found in *The Connected Discourses of the Buddha* (Bodhi 2000, p. 1264):

> When the uninstructed worldling is being contacted by a painful feeling, he sorrows, grieves, and laments; he weeps beating his breast and becomes distraught. He feels two feelings—a bodily one and a mental one.

Mindfulness of unpleasant feeling tones helps us to be with the experience without adding anything to it through "creative engagement." Sometimes we realize that all we can do is accept things as they arise. At other times we see clearly that we can do something to transform them, either inwardly or outwardly. Mindfulness will not take the pain away but it can change the way we engage with it.

Neutral feeling tones are the baseline that is the mid-point between pleasant and unpleasant feeling tones. If we were to assume (as people do) that the baseline should be a pleasant feeling tone of, let us say, a minimum of five on a ten-point scale of pleasure (one being low levels of pleasure and ten being very high), then we only have a five-up-to-ten range of pleasant experience and the

rest is interpreted as neutral or unpleasant. If instead we perceive that the baseline is neutral then we have a range of potential positive feeling tone from at least one to ten. We are not grasping for relatively strong positive feeling tones in our moment-to-moment experience but are able to derive peace and pleasure from neutral feeling tones right up through the full range of positive feeling tones. And with practice, negative feeling tones, particularly less intense negative feeling tones, can become areas of growth as a result of concentration and enquiry. We are more acutely aware of unpleasant feeling tones than pleasant ones due to the positive–negative asymmetry effect (Taylor 1991) but by increasing awareness of neutral feeling tones and therefore the full range of pleasant feeling tones, we effectively re-equilibrate how we feel. In this manner we discover more opportunity to appreciate happiness and joy in our lives. And we appreciate experientially that quiet contentment in the neutral state is positive.

Another method is to repeat inwardly and silently these sentences:

> I appreciate my efforts
> I rejoice in my success
> I am grateful for my existence

Mudita means finding joy and happiness in others' happiness and can be contrasted with envy and with taking joy from others' suffering. The phrases can therefore also be used in relation to different categories of people: those we like and who support us, or those we have difficulty with, etc. We can also add to the list things in nature and animals:

> I appreciate your efforts
> I rejoice in your success
> I am grateful for your existence

In this type of practice, concentration resides in repeating the sentences and experiential enquiry is cultivated when we genuinely see the goodness in ourselves and others. It helps us to shift our focus from only what is difficult and negative. Those who do not like to repeat sentences silently inwardly while meditating can connect with the resonance of the quality of the exercise by experientially asking: "What is it I can appreciate right now about this experience? What is it I can rejoice in? What can I be grateful for, however small?"

To conclude, when trying to be mindful of feeling tones, we focus on contact with an object in experience such as a sound or a visual object, and deepen that focus to be aware of the quality that arises upon that contact. The experiential enquiry element resides in noticing how the feeling tone changes over time or how the feeling tone changes when there is contact with a different object (such as a thought, a new sound, or a new visual object). In this manner we become

progressively more aware of different feeling tones that arise with different objects and also of how these feeling tones change within themselves. This growing awareness of feeling tones both during and outside meditation practice enables us to be more aware of and freer from their impact on our mood, communication, and actions.

Another aspect of our "feeling" life is more intense "feeling-sensation" or "affective sensation." The feeling tone is the tonality we experience immediately upon contact. That can be followed by a more intense feeling or affective sensation. We quickly give a meaning to this feeling-sensation, calling it sadness or anger for example, and then it becomes a full-blown disturbing emotion because it appears to associate with some previous event or period of intense sadness or anger.

Rather than analyze the meaning of the intense feeling and the stories associated with that meaning, it helps to stay with the feeling-sensation, focusing on the location within the body where it is felt. Then one can concentrate on it and, with experiential enquiry, examine it. Is it heavy or light, agitated or calm, solid or fluid, hot or cold? Is it still there in the same way? How long does it last?

On one occasion I visited a flower shop and the cashier seemed to look at me as if I was stupid when I did not understand what she said to me. I felt something intense and unpleasant in my chest area so I paid and left but decided to observe mindfully the unpleasant feeling-sensation without falling into the reactive storyline of "I will never go back to this shop." The feeling-sensation continued for about ten minutes as I observed it. Over the next two hours, whenever I thought about the incident, the feeling-sensation returned for a few seconds and stopped when I stopped thinking about it. I deliberately took time to focus on and experience the sensation in my chest. After two hours, even when I thought about the incident, the feeling-sensation did not return. By being mindful in a questioning way, the feeling-sensation did not settle and intensify into a disturbing emotion. It just evaporated. There are many light feeling-sensations that we experience throughout the day that we do not need to embed and make stronger than they need to be. By focusing and using experiential enquiry, we can free ourselves from much emotional negativity and turmoil.

When there is great emotional intensity, it is generally because something has shocked our whole system—mental, physical, and emotional. Then we have to accept the need to process such a shock and that it will take time for its effect and reverberations to pass. When my brother and my father died, each time it took my system a year to begin to recover from these losses. Meditation and mindfulness helped me to be with these feeling-sensations and not to magnify them unnecessarily. With such intensity, creative meditative distractions can

remind us that we are not only this intense feeling-sensation but that we can still enjoy nature, help others, and receive their support.

Meditative questioning

The final meditation method I want to explore in terms of concentration and enquiry is the questioning meditation I learned in Korea. It involves just asking the question: "What is this?" Sitting, walking, lying down, and standing, one keeps asking this question silently. The anchor is the question itself. As soon as the meditator is distracted, she comes back to the question. Returning to the question brings us back to the whole present moment. When we are lost in abstraction, mulling and musing, we are not present but caught in small, often repetitive, parts of our story. Coming back to the question, we come back to mindfulness of the specific experience of this current moment.

Experiential enquiry is not repeating the question like a mantra but each time asking the question with perplexity. This meditation involves developing a questioning orientation, which one can feel in the body. Teachers suggest locating the questioning in the belly, so that the question does not go to the head, become over-intellectual, and even create intensity and headaches. This is not a psychological, analytical, or existential enquiry. It is practicing becoming like a question mark. It is as if one was asking the question of the whole moment without trying to define any part of that moment.

It is a questioning practice and not an answering practice. We are not looking for an answer and this is challenging as it goes against our usual tendency to ask a question in order to receive or find an answer. The effect of this meditation is to help us become more creative and flexible. It helps to dissolve certainty and fixity and fosters wonderment and openness.

Nevertheless, while doing this questioning practice, one needs to keep a balanced state of mind, and cultivate both focus and enquiry in a stable way. In *Great Doubt, Great Enlightenment* (Gou et al. 2014, p. 202), this citation from Yung-chia states:

> If one remains in deep calm without being aware, it means sinking into dullness and if one remains aware without being calm, it means becoming entangled in one's thoughts. If one is in a state of being neither aware nor calm, then one is not only entangled in one's thoughts but also submerged by dullness.

Here the pitfalls of meditation are pointed out. Although it is helpful to be calm and it can be one effect of meditating (whatever the method used), if we are too calm without a bright awareness we can become dull. It is essential not to use the meditation as a way to dissociate and become unconcerned. On the other

hand, if there is not enough calm then it becomes easy to be either distracted by thoughts or exhilarated by them.

In *Straight Talk on the True Mind* from the *Collected Works of Chinul* (tr. Buswell), Chinul (1158–1210) points out:

> As Yung-chia said, "the alertness of calmness is correct; the alertness of deluded thoughts is wrong. The calmness of alertness is correct; the calmness of blankness is wrong." Since blankness is not present in calmness, and distracted thoughts are not engaged during alertness, how will any deluded thoughts be able to arise? (Chinul 1983, p. 172)

Meditation involves a balance between concentration and enquiry. It is important to cultivate and experience both alertness and calmness, and both quietness and clarity. We develop a grounded sensation of questioning not only when we do formal meditation practice but also in daily activities, when we walk, work, or relate. We are trying to infuse our life with a direct and beneficial sense of perplexity.

These different meditation practices are tools for daily living. Each has a specific usage and a certain effect. Meditation is not sacred and nor are any of the tools. The question we need to ask ourselves is: "Does this work?" Does regular meditation practice help me to become calmer and clearer? Does it help me to relate better to myself and others? The aim is to dissolve over time the fixed and restrictive habits of mind, body, and heart so that they can go back to their creative functioning. We are trying to loosen the rigid framework that develops over time as a means of coping with the vicissitudes of life in order to enable our capacities to blossom.

Cultivating meditative concentration and enquiry produces a creative awareness that is characterized by acceptance and transformation. When we are mindful we see as much our good qualities as our painful tendencies. When we know for ourselves and experience our positive capacities, it is possible for them to flower and for us to develop them skillfully. When we understand that we are not always bad or in difficulties but that identifiable factors and conditions cause difficulties to arise, we can engage creatively with those habits that cause us difficulty. Their intensity and duration can be reduced and some can disappear completely.

Conclusions

In this chapter I have shown that the two main elements of meditation are concentration and enquiry. This way of looking at meditation enables us to circumvent certain restrictive views around meditation that see it as a strictly religious exercise belonging in the temples with professionals or aligning it only with the method of one Buddhist school of meditation. Furthermore, by exploring its

essential elements, meditation becomes relevant to a scientific, psychological framework, as well as something practical and easy to develop in our daily life. This way of looking at meditation has allowed me the possibility of widening the range of meanings of mindfulness and of its applications using the different tools of awareness. I put some emphasis on the practice of mindfulness of feeling tones because to explore that particular practice will show the propitious connection between Buddhist meditation and psychology.

In summary, concentration helps us to focus and anchor in our experience with the possibility of less unnecessary self-referencing, cogitating, and self-doubt. Experiential enquiry allows us to come into contact with the processual nature of our experiences, thereby mitigating fixations and overgeneralization. Not only that, but by cultivating both equally, we develop a creative awareness that can make a great difference in our life. This creative awareness leads us to dissolve the habitual patterns that limit us. By dissolving something, we do not just create an empty space but a creative space where new things can emerge. It is like the bell (i.e., a metal bowl) used to time a group meditation session. If you hit the bell with a stick, it resonates because the metal bowl is empty. If you fill the metal bowl with a small cushion and again try to hit it with a stick, the sound will be flat and unmelodious and will not resonate. In the same way, when the non-restful resting state of the mind has quietened down there are many more opportunities for thinking, acting, and speaking in a creative way while responding to our environment in an appropriate and skillful manner. This is the power and the promise of meditation.

Personal Meditation Journey

I became interested in meditation in 1971 aged 18 and in 1975 I decided to travel to Asia. Along the way I went to Nepal, India, and Thailand. In Thailand I met some Korean monks who told me there was an opportunity to learn meditation in Korea. I decided to stop there for a month and stayed for ten years. Early on in my stay I decided to become a Seon (Zen) Buddhist nun. This entailed being a postulant working in the kitchen for a year, but being one of the rare Westerners at the time and not speaking the language I was allowed to enter the Seon hall quite quickly. This means that for about ten years I meditated ten hours a day for six months of the year (three months in summer and three months in winter). We would sit for 50 minutes and walk for 10 minutes throughout the day, interspersed with eating times and daily working period. The method of meditation was Seon questioning.

After ten years I stopped being a nun and returned to lay life. Later on I married my husband and we joined a Buddhist community in England where most community members practiced insight meditation. I joined a few insight meditation retreats (also known as mindfulness or *vipassana* retreats) to learn this technique and found it quite useful. It was while doing these insight retreats, where actually both *samatha* (concentration) and *vipassana* (enquiry) were taught, that I realized the essential elements of insight meditation were not different from the essential elements I had learned in the Seon tradition. It was then that I found the formulation of "creative awareness." After a while I was asked to teach retreats with my husband, Stephen Batchelor. We decided to teach two types of retreats: regular Seon retreats following a Seon format; and secular Buddhist retreats that combined an insight approach with a Seon approach following an insight retreat format.

Every time I teach I join in all the sitting periods of the retreat. In meditation I find myself doing a combination of both mindfulness meditation and questioning meditation. Generally the main focus will be the sensation of questioning in the belly grounded by awareness of the breath, sounds, sensations of the body, or thoughts arising and passing away in the background. Through teaching many different people over 25 years, I have seen clearly that any technique of meditation (however great) will not suit all people. Thus, I became a multi-choice teacher, suggesting different ways to do any technique, as well as suggesting that no method is the only method for everyone. Moreover, for a book on women and Buddhism I interviewed 40 Buddhist women, from Asia, Europe, and America, both laywomen and nuns. What I learned from that experience was that what was important was not the specific Buddhist framework or the technique of meditation but the sincere application and dedication of the practitioner.

I am grateful for my years of nun training in South Korea. It gave me a good foundation to develop the practice further in daily life. My main interest has always been to develop wisdom and compassion in all aspects of my life. And I did find and continue to find that meditation is very helpful in that regard.

References

Analayo, B. (2007). *Sati*. In W.G. Weeraratne (Ed.). *Encyclopaedia of Buddhism*, Volume **8**, no. 1. Sri Lanka: Department of Buddhist Affairs. Available at: http://www.buddhis-muskunde.uni-hamburg.de/fileadmin/pdf/analayo/publications.htm

Analayo, B. (2009). *Vedana; Vipassana*. In W.G. Weeraratne (Ed.). *Encyclopaedia of Buddhism*, Volume **8**, no. 3. Sri Lanka: Department of Buddhist Affairs. Available at: http://www.buddhismuskunde.uni-hamburg.de/fileadmin/pdf/analayo/publications.htm

Bodhi, B. (tr.) (2000). *The connected discourses of the Buddha*. Boston: Wisdom.

Bodhi, B. and Nanamoli, B. (tr.) (1995). *The middle length discourses of the Buddha*. Boston: Wisdom.

Brewer, J. A., Elwafi, H. M., and Davis, J. H. (2012). Craving to quit: Psychological models and neurobiological mechanisms of mindfulness training as treatment for addictions. *Psychology of Addictive Behaviors*. [Online] May 28. Available at: http://www.ncbi.nlm. nih.gov/pubmed/22642859

Chinul (1983). *The Korean approach to Zen: The collected works of Chinul* (tr. R.E.Buswell). Honolulu: University of Hawaii Press.

Dreyfus, G. (2013). Is mindfulness present-centered and non-judgmental? A discussion of the cognitive dimensions of mindfulness. In M.J. Williams and J. Kabat-Zinn (Eds.). *Mindfulness*. London and New York: Routledge.

Gollwitzer, P. M. and Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, **38**, 69–119.

Gou, Muyeo, Hyeguk et al. (2014). *Great doubt, great enlightenment*. Seoul: Jogye Order.

Kremen, I. (1994, talk transcribed and revised 2012). *On the score of 4'33" (original version in proportional notation)*. John Cage Trust. [Online] January 28. Available at: http:// johncagetrust.blogspot.fr/2012/01/on-score-of-433-original-version-in.html

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events. *Psychological Bulletin*, **110**(1), 67–85. Available at: http://taylorlab.psych.ucla.edu/1991_Asymmetrical%20Effects_Positive_Negative%20Events_Mobilization-Minimization%20 Hypothesis.pdf

Warren, J. (2013). How understanding the process of enlightenment could change science. *Psychology Tomorrow Magazine*, issue 4. [Online] January 4. Available at: http://www. psychologytomorrowmagazine.com/inscapes-enlightenment-and-science/

Chapter 3

How conscious experience comes about, and why meditation is helpful

Guy Claxton

Introduction

This chapter applies recent thinking in the fields of consciousness studies and embodied cognition to the subject of meditation. In particular, I will sketch an answer to the question "How does conscious experience (CE) come about?" and then use this to make some suggestions about what meditation is and why it should turn out to be helpful in promoting human flourishing and compassion. The main focus will be on mindfulness as it has come to be practiced in secular Western contexts, as well as in the context of monastic Buddhism.

Metaphors of mind, old and new

Meditation is designed to alter the quality and/or the content of consciousness, as well as of behavior. Specifically, many meditation practices attempt to focus attention more acutely than usual on the phenomenology of experience: How it arises, unfolds, and passes away. Attention is paid to these and other aspects of the *nature* of conscious experience, as well as (as is more normally the case) its *content*. If we are to begin to understand how meditation "works," therefore, it is useful to see what cognitive science has to say about these matters. If scientifically-based approaches to the arising of conscious experience are valid, they may then offer useful pointers to practice: where and how it is most advantageous to focus one's attention, for example.

But are these scientific models valid? One test is empirical: do they account for observed phenomena and predict new ones? Another, though, relates to the extent to which their pre-theoretical presuppositions unquestioningly import, and merely embellish upon, folk models of the mind. Are we sometimes merely adding a scientistic veneer to old images of mental processes? We will return to empirical matters later; here I want to begin by making some remarks on the second point.

In science, as in folk psychology, buried metaphors often drive thinking. Consciousness and conscious experience are no exception: they tend to be construed through metaphor. For some, consciousness is a kind of brightly-lit chamber or theater stage in the mind, and conscious experience is the contents that happen to be "on-stage" at any moment. Some cognitive psychologists have associated this "chamber of consciousness" with constructs such as working memory, or the "central executive," in which case the stage becomes a workshop where processes are applied to the contents (e.g. Baddeley 2007). This metaphor invites one to think about other "dark" regions of the mental theater where the same contents (props, actors, and so on) may exist, and maybe carry on functioning, but out of sight of the "viewer"—the "I"—who is some combination of stage director and audience member. If the actors start to behave badly, the "I" can also act as a censor, banishing ("repressing") taboo performances from appearing on the stage.

Alternatively, consciousness has been seen as a kind of screen or display-board in the mind, on which certain information—the contents of conscious experience—can be posted. The viewer of this information might again be the first-person "I," or, in the case of Barrs' (2005) "global workspace theory," might be other processing modules in the mind, not necessarily conscious, which can pick up the posted information and, perhaps, contribute their own expertise or perspective to ongoing problem-solving. The "I" could be seen as the computer operator, watching the activity on the screen and pressing keys to determine future processing, while the chips and processors on the computer's motherboard constitute a kind of "cognitive unconscious." Sometimes this metaphor has been used to make a strong distinction between the objects in mental storage ("declarative memory," capable of being made conscious) and the processes and programs that can be applied to that database (called "procedural memory," usually not conscious).

Consciousness (or "conscious awareness," I'll use those terms interchangeably) could also be seen as a roving spotlight that sequentially highlights (or "lights up") different contents in memory (e.g. Crick 1984). In this image, mental contents are not moved around between different locations, some of which are conscious and some not, but "stay put" and are illuminated *in situ*. Sometimes this illumination is seen as a form of neural activation—people often talk about different parts of the brain "lighting up"—and the activation itself is capable of altering the activated representation. This metaphor, often used in the context of creativity, allows the source of illumination to be narrow, focused, and intense, or diffused, more all-encompassing, but perhaps of a lower level of intensity (or, sometimes, "arousal").

All of these metaphors suggest interesting ways of thinking about consciousness, and are capable of being applied to "mindfulness." Some suggest, for

example, that mindfulness is like turning up the brightness on the stage lights, or varying the focus of the spotlight. Or that mindfulness involves learning to shift the perspective of the viewer from actor on the stage, to stage director, or even to a dispassionate observer in the audience, unmoved by the drama unfolding before her. But all of these images are limiting and capable of being misleading (if taken too seriously or pushed too far), as all metaphors are. Some are more biologically plausible than others—there is no evidence, for example, that there are real locations in the brain that correspond to the central executive or the global workspace, to which passive "contents" get sent for processing, like books being recalled from the stacks of a university library and placed on a student's desk.

However, my purpose here is not to offer a detailed critique of these depictions. (That job has been well done by Blackmore 2003, Shanon 2001, and others). Instead, I want to explore the potential of a different perspective on consciousness that is emerging from the hybrid study of "embodied cognition." This newly constellated focus of enquiry is an offshoot of cognitive science, drawing principally on philosophy, psychopathology, experimental psychology, neuroscience, robotics, and evolutionary theory. Its focus is on the detailed interactions between body, brain, and mind, with a growing research base that suggests that no satisfactory account of human experience and behavior can be given if the body is not taken fully into account. The computationalist idea that we are like computers or virtual machines that can be instantiated or embedded in a variety of different "housings" and "carriers," and that what matters is really the "logic" of the machine, not its physical constitution, is hotly contested. This new discipline is still in formation, and those involved certainly do not speak with a single voice. Many would consider the perspective I am going to explore here a rather tame version of embodied cognition (e.g. Chemero 2011). Nevertheless, I hope to show its utility in thinking about meditation.

I shall interweave two new metaphors for this perspective that I will call "welling up" and "unfurling." They are very similar, but emphasize slightly different aspects of the underlying view. To illustrate unfurling, imagine the growth of a plant, a fern say, or perhaps a white rose. The fern starts from an invisible spore in the ground, and then grows over time into a large, visible, highly differentiated mass of fronds. Let's say the spore is the original seed of an intention, and that motivational seed unfurls into a complex physiological and behavioral expression of that "germ of an idea." Take a time-lapse film of the growing fern, and speed it up, so that the whole process now takes a quarter of a second. It will be hard to spot the stages of growth. It will look like one moment there was no fern, and then, suddenly, there is a fully formed fern-thought, or action, or emotion.

This perspective on the formation of ideas, acts, and experiences was originally dubbed "microgenesis" by Heinz Werner (1956). Werner saw the generation of a thought or an utterance not as a process of assembling word-meanings according to syntactic rules (the dominant cognitivist image at the time), but as a process of rapid evolution from a subcortical glimmer or meaning to an elaborated complex of sensory and motor activations across the brain as a whole, and thence back again to the muscles and the viscera of the body. Jason Brown (1991, 1999) has developed the idea of microgenesis further, and linked it to the cognitive psychology found in various traditional Buddhist teachings such as the *Abhidharma*, in a range of publications on which I am drawing here.

Nothing in this image suggests when or how, or even whether, consciousness appears. It is perfectly possible that the seed germinates into an action rapidly and effortlessly without any self-consciousness, or even conscious awareness. For example, we may we walking down the pavement deep in conversation with a friend, completely oblivious to the subtle maneuvering of our bodies as they chart an intricate trajectory between the oncoming pedestrians; or eating a bowl of cornflakes whilst totally engrossed in a movie. If we wanted to add consciousness to the metaphor, we can swap the fern for the rose-bush, and call the growth of the foliage "unconscious," and the blooming of the white flower "conscious experience." (This of course explains nothing by itself, but may direct us, as metaphors often do, toward more compelling considerations.)

To capture the experiential side of microgenesis more fully, I will make use of another metaphor, that of welling up—as, for example, when we well up with emotion and know that we are on the verge of tears. Sometimes we "well up" with feeling without clearly knowing why, as when we are suddenly touched or moved by an image of starving children on the evening news, or by an unexpected moment of forgiveness or gentleness in a film, or by a piece of music. (Adele's song "Someone Like You" catches a number of people by surprise in this way (Doucleff 2012).) We might be able to rationalize the response after the event, but at the time we are, as we might say, "caught unawares."

Most people have this experience of "welling up" occasionally. But my more radical suggestion is that these special moments are actually prototypical of our conscious experience as a whole. All our thoughts and sensations well up from visceral and unconscious origins in the same way, but we habitually become aware of our experience only when it is already well formed, and miss the distinctive feeling of an event unfolding within us over time, over which we may or may not have control. One of the effects (and intentions) of various forms of mindfulness training (as we will see later) is to bring conscious awareness to earlier and earlier stages of this up-welling.

Welling up of gesture and thought

Psycholinguist David McNeill at the University of Chicago has chronicled the unfurling or welling up of overt actions and conscious experience in great detail in the context of speech formation (McNeill 2005). His research focus was on the relationship between what we say—for example, when we are describing a cartoon we have just watched to a third party—and the hand gestures that spontaneously accompany the speech. Through detailed analysis of videotapes, McNeill and his collaborators have discovered that speech and gesture emerge from the same root, and carry complementary aspects of the meaning we want to convey. For example, describing one scene, one observer said, "Sylvester was in the Bird Watchers' Society building, and Tweetie was in the Broken Arms Hotel . . . " As she referred to Sylvester she gestured to her right-hand side, and as she referred to Tweetie she gestured to her left, indicating that the two locations were on opposite sides of the street. A few seconds later, she reported that "He then ran across the street," and gestured to her right as she did so—indicating that it was Sylvester who crossed the street, not Tweetie. Speech and gesture were woven seamlessly and unconsciously together in order to resolve the potential ambiguity of the pronoun. Speech and gesture were unfurling together from a common root of understanding, like two fronds of the same fern.

More generally, we might imagine—if we could slow the "movie" of our own experience back down sufficiently—that a desire to communicate something of what we have experienced begins to stir deep in the brain and the body. It might involve a need for approval or a desire to impress—to want to be a "good subject" in Professor McNeill's experiment—or a wish to convey involvement and amusement in the cartoon, or a dozen other intentions. When I say to my wife "I think the front lawn needs cutting," I can trace the source of that casual comment back to a small archaic tremor of potential shame about being disapproved of by meticulous neighbors. When she says to me, "Shall we go for a walk if it's nice tomorrow?" I can, I fancy, hear a faint echo of anxiety about my health and the sedentary nature of my work.

These initial spurts of concern then ripple out, recruiting memories and muscles into an intricate pattern of activation. In McNeill's study, there are memories of the cartoon, and emotional concomitants that cause the voice quality to intensify, a chuckle to form in the chest, and the corners of the mouth to arch upwards. At the same time, the internal images are activating appropriate patterns of words, and the muscles to shape the voice box and expel air so as to make the right sounds, and eye contact with the listener is held in order to judge whether we are being successful in conveying the meaning and the feeling that we want . . . and so on. And arms and hands begin to form gestures that carry other aspects

of the picture I want to convey. A whole-body state fans out from the originating impulse, unfolding into an intricate pattern of embodied meaning.

The broad architecture of these channels of communication is determined by genetic programs, though the actual expression of these genetic guidelines is modulated by environmental and experiential factors. The fine details of how these ripples of activation develop, however, are heavily experience-dependent. Synaptic connections are changed and chemical responses throughout the body are altered by learning, so the pathways along which meanings unfurl are individual and variable. At the risk of creating metaphorical overload, the tidal surge of electrochemical activation is channeled by the embodied formations that thousands of previous tides have sculpted and left behind.

Some of these ripples will engage visceral and autonomic processes: Blood pressure and heart rate might go up; respiration volume might become shallower; background processes of digestion might be inhibited; hormones such as adrenaline or cortisol might be released into the bloodstream. All of these changes will be signaled to the brain and will alter levels of arousal, as well as the focus of attention (what we are on the lookout for) and the memory contents that are recruited into the unfolding meaning. The brain alerts muscle groups to the kinds of action that might be required, and facial expression and patterns of body tension are altered accordingly. Some of these muscular changes might involve coordinated patterning of throat, mouth, and lips, at the same time as the lungs are expelling air in synchronized bursts—resulting in the utterance of a sigh or a sentence. Some more muscular activity might result in simultaneous movements of shoulders and arms that produce gestures that disambiguate or augment the meaning of the utterance. And so on.

It will be clear that this kind of embodied description of how conscious content comes to emerge takes us in different directions from the "central executive" or "spotlight" metaphors, and thus offers complementary perspectives on the process, the experience, and the benefits of meditation. We will come to this later, but let me offer one illustration here. Meditation is undertaken with the intention of improving (however that is defined) the quality of both experience and behavior. I might be hoping, for example, to feel more peaceful and to become a kinder person. I might be hoping, also, to become more authentic— that is, to feel that my actions and my awareness, which have often felt dislocated or at odds, are become more congruent. Part of the unsatisfactoriness of my life might be that my "kindness" feels forced; that it sometimes emerges along with a sense of reluctant or resentful duty rather than a whole-hearted desire to help or to serve. The earlier metaphors do not seem to offer me much of a purchase on this desire to reunite thought and body, but the unfurling metaphor does. At the very least, we can ask how (and why) the integrity of the

original "seed" becomes lost, and I end up with a white lotus of consciousness apparently grafted on to a much pricklier kind of plant. Let's pursue this line of metaphorical thought a little further.

Espaliered experience

If and when an original intention starts to form a linguistic utterance (or a written or signed sentence), all kinds of syntactic and semantic considerations come into play. Through spreading activation, the unfurling meaning—the felt sense, as Eugene Gendlin calls it—starts to recruit candidate words and syntactic frames to carry the intended meaning (Gendlin and Rychlak 2000). But it could be that no readily available words or frames are capable of accurately conveying the underlying intention, so, if the utterance is to proceed, some of the nuances and subtleties of the meaning may be lost in transcription, and what eventually comes out is only an approximation—perhaps a crude approximation—to what was intended. The horticultural term *espalier* refers to the process of training a plant—often a fruit tree—into a particular shape as it grows, through selectively pruning off-shoots and tying other shoots to a frame that directs their growth. Language acts as a kind of *espalier* for the meaning that is developing within the body-mind.

If the visceral seed is relatively simple and conventional, then the translation from meaning into words may be good enough. The process of *espalier* does not do significant damage to the original intent. But if the intended meaning is novel, unusual, or sophisticated, then the transcription into language may fail more seriously. Accuracy of transcription will depend on the mental vocabulary and range of grammatical constructions that are potentially available and the subset of those that are actually, in the moment, accessible. It will also depend on the extent to which the speaker is (both dispositionally and momentarily) sensitive to any misfits between pre-verbal intention and the evolving utterance, and whether they consider it important to "get it right," or whether, in a particular case, "near enough is good enough." And this in turn will need to take account of the length of time that is available for monitoring, editing, and reformulating the requisite bodily action-programs.

One kind of "training" that happens to the germinating intent is so common that it is rarely noticed. It involves the linguistic conventions present in many (but not all) languages adding a kind of "self" to the equation. Instead of just experiencing a thought, perhaps one that said "We need some more milk," we say "I think we need more milk." Added to the thought is a somewhat gratuitous thinker—just as, when we say "It is raining," there is no "It" that is doing something called raining. "I," like the "It," is a linguistic convention. Yet, over

time, as a child learns to use the dummy word "I" correctly and fluently—"I saw," "I tried," "I decided," and so on—it comes to seem that it does indeed betoken some kind of ever-present ghostly observer, instigator, or narrator lurking behind appearances. We get used to adding this ghostly espalier to each meaning as it unfurls. Eventually it appears self-evident to us that there is a (real, albeit ghostly) observer who is capable of watching thoughts and experiences as they appear in and disappear from consciousness, whereas *both* "I" *and* "thought" emerge, in the moment, as aspects of the same up-welling experience. (For a traditional Buddhist rehearsal of this argument, see Kalupahana 1987. For a contemporary philosophical treatment, see Parfit 1986. For a more detailed psychological exposition, see Claxton 2005).

In daily life, the assumption that the "I" in a linguistic construction such as "I tried but failed" refers to a real inner entity makes personal judgments of (in this case, lack of) self-worth or self-efficacy feel both more serious and more "sticky." There is apparently some*thing* (or some*one*) to which the judgment can adhere, and which therefore feels culpable for the "failure." Meditation, like psychotherapy, often attracts people who are particularly plagued by such debilitating judgments, and may be helpful in reducing their stickiness, and therefore their air of validity and seriousness. Mindfulness-based stress-reduction and cognitive therapy have both proven to be effective in this regard (Teasdale and Chaskalson 2011a,b).

Habits of attention

The process of welling up can take quite different time courses. Sometimes it takes only a tenth of a second, in which case it is very difficult to catch the unfurling as it happens. And sometimes the development of a germ of an idea into a communicable train of thought can take seconds, or minutes, or even longer. We may have to "um" and "er" while we wait for the *mot juste* to come to mind. Sometimes the unfurling is blocked, as when our brain refuses to come up with the name of a dear friend when we are having a "senior moment." In many of the familiar stories of creative insight, the solution to a problem can hang elusively just out of our grasp for months or years, until exactly the right set of triggers come together and the answer is propelled into consciousness like a circus performer shot from a cannon.

However, overlaid on these different time-scales there may be habits of attention that make us more or less sensitive to the unfolding dynamics within. We may develop a generalized habit of not paying attention to the early stages of the unfurling so that, whatever its intrinsic time-course, we do not become consciously aware of what is welling up until late in its development. We come habitually to

notice aspects of experience that are already well-formed and elaborated, but do not notice the hazier or more undifferentiated precursors. Thus, instead of noticing the gradual clarification and differentiation of a thought or a feeling, we experience our own experience in terms of a step-wise distinction between things that are unconscious and those that are conscious. They appear to "pop into" our minds—or even, in a magnificent sleight-of-hand, to seem to spring, fully formed, out of the mouth of the "inner I." Thus—referring back to the earlier discussion about different metaphors for consciousness—what looks like a structural separation between conscious and unconscious can actually be a reflection of an acquired cognitive habit. We think we see a sharp distinction because we are inattentive to the slope that actually leads from unconscious to conscious.

We might also develop a habit of speeding up the unfurling process itself. We know that our embodied cognitive system is capable of registering regularities in its own processing, and therefore able to predict (with greater or lesser accuracy and/or confidence) what mental states are about to happen, on the basis of what mental states are already happening (Clark 2013). (The thought "I failed" becomes doom-laden, for example, as it has become a harbinger of an upsurge of negative self-judgments. Or, to use a more prosaic example, the glimpse of what looks like the tail of next-door's cat disappearing round the corner of the house leads us to expect, were we to run and peek round the corner, that we would see the whole cat; or even just to assume it is Felix without bothering to check.)

This ability to predict future states of mind makes it possible for us to take short-cuts in unfurling, and leap to conclusions about what probably or usually follows the current state. When we have to respond fast, this "quick best guess" can be advantageous; it can even save our lives. But if leaping to conclusions becomes habitual, we are likely to miss detail and novelty. We construct our own world based not on the unprecedented particularities of the moment, but on what is normal and conventional. Thus we can come to see in terms of rather ghostly stereotypes and generalizations rather than the vivid, complex individuality of what is actually present. (We experience a shadowy stand-in for Felix. Were we to have checked, we might have seen that it was in fact an entirely different cat for which, we have just read in the local paper, a distraught owner has offered a substantial reward.) In effect we are trading vitality and inquisitiveness for normality and predictability.

Going too far in this labor-saving, top-down direction obviously incurs risks and costs. We might try to make the world conform to our expectations, and thus persist in applying methods of thinking and acting that worked once but are not, in a new situation, appropriate or effective. (Applicants for jobs at Google are often asked if they have a track record of success in their field. Those who boldly say "Yes" are unlikely to be hired, because experience has taught Google

that such self-confidence often leads to people trying to replicate those successes by forcing new predicaments to fit old patterns; they are interested in people who can think from scratch and "flounder intelligently" in the face of quite new challenges (Friedman 2014).)

Language can certainly exacerbate this problem. There are many studies showing how a verbal label often leads to a kind of "functional fixedness" in which alternative ways of looking at or categorizing an object are rendered invisible by the label. In one classic study, Carmichael et al. (1932) gave subjects ambiguous pictures to remember with one of two suggestive verbal labels, e.g. "dumb-bells" versus "spectacles." When asked to draw the shapes they had seen, the labels had a marked effect in skewing what they thought they had seen. This is one way in which creativity is reduced by leaping to conclusions. Creativity also suffers in other ways. We can become deaf to our own inklings and hunches, which recent research has shown are vital aspects of our creativity (Martindale 1995). Being able to access and tolerate what some researchers refer to as "low ego-control" or "low arousal" mental states—those that are uncertain, provisional, ambiguous, or vague—is demonstrably conducive to creative insight.

The process of unfurling can be slowed down as well as speeded up. As we saw earlier, the process of checking candidate actions or utterances for accuracy and completeness may be subject to strategic control. We can allow the "stream of consciousness," or we can monitor and edit more carefully. When speaking a foreign language, for example, people may dive in and "give it their best shot" (especially in convivial company or after a drink or two), while on other occasions (or temperamentally more cautious people) we may self-monitor to the point of becoming tongue-tied (Krashen 1982). When candidate utterances are being held back for checking, the motor programs for producing the speech can be run "off-line"; that is, the sequence of articulatory muscle movements can be run in a way that produces muted versions of both the muscle movements themselves and their sensory consequences. (As part of children's language learning, their brains develop a complex matrix of correspondences between "what it would take to produce a sound," and "what the sound produced by those small movements would sound like.") These muted effects are very often associated with conscious experience (though they may not be).

Before we come to the question of when, how, and why aspects of the unfurling message are accompanied by (or rendered into) conscious awareness, let me summarize the major branches of the developing "fern" of experience. One branch creates ramifications of internal, "interoceptive" body states: visceral, hormonal, immunological, and neural. A second alters the direction and acuity of incoming sensation, via modulation of the "exteroceptive" perceptual

systems. A third branch begins to ready muscle groups for action. A fourth branch heads in the direction of linguistic and other kinds of symbolic outputs such as gestures. In meditation, we can focus on any or all of these facets.

Mindfulness can be viewed as a kind of psychological training that enables us to gain greater awareness of these habits of attention—speeding up or slowing down the perceptual process—and thus allows us to regain a great flexibility and control over our own ways of sensing. This in turn allows us to avoid some of the costs such as over-monitoring or leaping to conclusions.

One function of mindfulness, as we will see, is to enable us to separate awareness from judgment. We often avoid awareness of our inner process because along with awareness comes some kind of reflex judgment—we "like" it or we "loathe" it. A whiff of anxiety, and we may immediately tell ourselves we are being "stupid" for being anxious. An inconvenient feeling of tiredness in the middle of dinner with friends may leave us feeling angry with ourselves, or embarrassed, and inclined to "push away" the original feeling.

The emergence of consciousness

None of these complementary areas of ramification is originally or necessarily conscious. But along the way, different kinds of "experiences" may be produced that either enter consciousness directly, or are easily available to consciousness should we turn our attention to them. They can include:

- a perceptual world (the phenomenological world of sights, sounds, and so on that we inhabit)
- more or less clear bodily feelings, emotions, and moods
- inklings, hunches, promptings, and other kinds of intuition
- verbal or symbolic thoughts
- internal sensory and muscular images
- "memories" (images that come tagged as recollections of past events)
- expectations and intentions (feelings of readiness or anticipation).

It is widely agreed in neuroscience that conscious awareness—whatever it is and whatever it is for—emerges alongside complex neurochemical states of biological organisms like us (e.g. Kinsbourne 1997). To a rough approximation, consciousness seems to emerge when there is:

1 *Intensity*: External events are sufficiently *abrupt* or *intense*, for example, the sudden ringing of an alarm bell or appearance of a bright light.

2 *Persistence*: Intensity seems to interact with the *persistence* of a stimulus: Less intense events become conscious if they persist for more than around half a

second (Libet 1982). (At longer levels of persistence, consciousness often fades through habituation, of course.)

3 *Reverberation*: Persistence may occur not due to physical continuation of an external event but to conditions within the brain that allow activation to reverberate, for example round a well-worn neuronal circuit where resistance is low and activation can, so to speak, re-ignite itself. It is argued, for example, that we can easily retain a sensible sentence in mind because its elements "fit together" and create such a reverberating circuit; on the other hand, a list of random numbers needs to be continually rehearsed if its elements are not to "fade away" and become inaccessible (Johnson et al. 2013).

4 *Significance*: Consciousness seems to be attracted by experiences that are of personal significance. These may be threats to physical well-being or survival, or to possessions or personal attributes with which one is identified. Even events weak in physical intensity gain access to consciousness under these conditions: A creaking floorboard in a sleeping household; a disapproving expression on one face in an otherwise positive audience. Authors such as Edelman and Tononi have suggested that self-related events attract consciousness because they connect with a constantly active representation of the "core self" in the brain, and thus become part of a massively (and constantly shifting) reverberating circuit (Edelman and Tononi 2000).

5 *Checking*: If functionally connected to the core self, even apparently neutral or only very mildly significant events can potentially be subjected to more extensive "security checks." Candidate courses of action (such as a contribution to a conversation, as explored above) can be "held back," if time allows and if the cost of a (social) error is assessed as high. Dispositionally anxious people may be constantly on the look-out for remote threat possibilities, and thus become highly self-conscious or "inhibited" (Wells 2008).

The concept of the "core self" needs a little more explication in this context. First, it is not an aspect of experience, as was the sense of "I" that we talked about earlier; it is a theoretical construct. It is seen as essentially a motivational and emotional concept, representing a semi-stable plexus of self-related concerns that "sets" or sensitizes the brain-body system to certain kinds of events. These events become seen as potential threats to personal projects or self-concerns, or as "grist to the mill" of these concerns. Sensitivity to criticism may make that lecturer particularly prone to detecting disapproval in facial expressions, or even to misinterpret neutral expressions as disapproving. Compulsive flirts are "set" to notice attractive members of the audience who might be approached and "chatted up" over coffee, or to imagine (correctly or mistakenly) that a friendly smile is an invitation to introduce some sexual banter or

innuendo into the conversation. So the core self consists of centers of activation in the body-brain system that embody hopes, fears, assumptions, and beliefs about the world, often derived from earlier life experiences. Having been laughed at for making mistakes, for example, may leave error/ignorance as a threat to the core self, and thus induce strategies of avoidance or perfectionism as ways of warding off the perceived threat (Bucci 2011).

Some of the defense mechanisms, as just illustrated, involve tactical action in and on the world so that the threatening circumstances do not occur. Other defenses, though, involve protecting one's self from the *conscious experience* of threat or disappointment rather than from the occurrence itself (Hamilton 1983). For example, the ability to anticipate upcoming aspects of the unfolding meaning patterns means that road-blocks and diversionary tactics of various kinds can be set up, so that the anticipated experience of failure or fear does not actually come about. We are able to "switch the attentional points," as it were, so that an up-welling train of thought is diverted onto a safer (more anodyne) track. Through the deployment of cortical inhibitory processes, we become able, as Daniel Goleman has put it, to ignore (inconvenient or threatening aspects of) experience, and then ignore the fact that we have ignored it (Goleman 1985). Thus, what gets incorporated into conscious experience, or deliberate descriptions of experience, may be not just a normalization of the original seed of meaning (as described above) but (at a pre-conscious level) an expurgation of it as well.

A final set of pre-conscious defensive strategies involve dampening visceral and muscular signals of fear or anxiety in the body, so that they do not arrive at the brain areas involved in the generation of consciousness—or do so only in an attenuated state. Muscles can be tensed, for example, so that upper lips do not quiver, as they otherwise might in the face of fear or distress. The throat can be constricted, and muscles of the chest clamped, so that up-welling vocalizations of distress can be contained (Trimble 2012; Vingerhoets 2012). (The feeling of "choking up" that often precedes a burst of sobbing reflects this reflex attempt to contain or disguise the impending expression of distress; it may be successful, or it may be over-ridden by the irresistible strength of the original body-mind state.)

This has been a necessarily brief outline of the processes and phases that a meaning-seed can go through, on its developmental journey from the visceral core to its full-blown expression in body, action, speech, and mind. Even so, it will be clear that the unfurling of meaning is potentially a whole body-mind event, and also that the extent to which this event recruits processes that produce conscious experience is extremely variable. The conscious experience that arises may be incomplete, edited, and distorted in a variety of ways. It may also contain ingredients added along the way that are only there because we have

leapt to conclusions, or unconsciously stirred in beliefs and assumptions designed to make the expression more palatable to any real or imagined audience (including ourselves). The *Oxford English Dictionary* defines "sophisticated" as "mixed with some foreign substance, adulterated, not pure or genuine." Human consciousness is often highly sophisticated in this sense.

There is both Bad News and Good News in this picture. The Bad News is that our conscious perceptions are not a reliable guide either to the way the world is, or to the internal world of felt concerns, and it is therefore highly desirable—a form of basic sanity, we might say—to have a tentative and rather skeptical relationship with our own consciousness. The Good News is that a good deal of this unreliability stems from our own mental habits, and we are therefore in a position, as we are with any habits, to practice alternatives and see if they stand us in better stead. That, as I understand it, is what meditation is for.

How meditation helps

"I wonder if the Wise Lady from Philadelphia is still around?" I said.

"Who?"

"There once was a family who put salt instead of sugar into a cup of tea. Their name was Peterkin, as I remember. So they went to the doctor and the grocer and the pharmacist and God knows who else, trying to make salt taste like sugar. Nothing worked. Finally they went to the Wise Lady from Philadelphia."

"And?"

"She told them what to do."

"What?"

"Pour a new cup of tea."

Padillo leaned back in his chair and put his feet on the desk and looked up at the ceiling. "You don't remember her name, do you? If you do we'll give her a call."

Ross Thomas (2011)

The model I have outlined suggests several ways in which our attentional habits change the nature of our experience, which can be both beneficial and trouble-making. A degree of trouble is particularly likely to ensue if these attentional habits become too rigid. We stir into our experience, as it is being fabricated by the body-mind, a variety of assumptions that place unnecessary constraints on our fluidity and equanimity, and then wonder why our experience, like the Peterkins' cup of tea, is distasteful. Like the Peterkins, we are inclined to go chasing after various nostrums for making life taste better, without realizing that the key lies not in addition but in subtraction. Our left hand added the salt whilst we were not looking, and the cure involves making a fresh cup of tea, but this time without the unconscious adulteration. In fact we can

be worse than the Peterkins. They just got it wrong once. We are capable of behaving more like people who have been fed a post-hypnotic suggestion: Whenever you make a cup of tea, surreptitiously add some salt, and then forget that you have done so.

From my experience, mindfulness meditation involves a set of practices designed to retrain these attentional habits so we can break the hypnotic spell. Then we are able to see what we have been doing to ourselves, notice what our inadvertent tampering has cost us, and try to change the habit. Basically, mindfulness training strengthens our ability to do three things:

1 To catch our experience earlier in the process of unfurling

2 To slow down the process of unfurling

3 To stabilize attention so that we can hold it still at different points in the evolution of an experience and take a good look at what is going on there.

A lot of mindfulness training starts with trying to pay closer attention to the physical sensations of the body, and/or the non-verbal world around us. Attending to the body enables us to dwell with greater awareness at the origin of our experience, so that one becomes more capable of being in at the beginning of the unfurling process. Two meditations I have been taught capture this aspect well. One involves sitting on the brink of your own "unconscious" with the same degree of dedicated vigilance and stillness that a cat might have as it waits by a mouse-hole—except in meditation you have no idea what kind of creature might emerge from the hole!

The second, similar practice is best done by people who have had the real experience of travelling on the London Underground. You stand at the end of the platform nearest to the tunnel from which the train is going to emerge, and you attend very carefully to see if you can catch the very first, tiniest intimation that a train might be on its way. Is that a slight stirring in the air that I feel on my skin? Is there the faintest rumble of sound? Is that a minimal gleam of light on the tunnel wall? Then you feel in as much detail as you can the gathering intensity and detail of the experience, and finally the train rushes out of the tunnel and hurtles past you . . . Having practiced this in the real situation for a while, you then try to carry the same acute attentiveness to the observation of your own "trains of thought" as they make their way toward full awareness. A reverse practice is to ring a bell, and try to listen to it as it fades away until there is a moment where you are not sure if it has gone or not—and then to hang in the silence that ensues . . . All of these practices give you a taste for what that open, attentive, expectant quality of attention feels like, so that you can recognize it when it happens and thus work to make it more frequent and more steady.

As we become more sensitive to subtle changes in breathing, or to the sweatiness of our skin, or to the feelings in our stomach, we are able to sense more clearly how those feelings, in what Antonio Damasio (2011) refers to as the visceral core of our being, relate to what is going on "center stage" in awareness. We can slowly begin to notice more clearly the quality of sounds, sights, smells, and so on, training ourselves not to rush too quickly into categorization. Sometimes, people develop a mental habit in which they only sample their experience of the world just enough to make a recognition or a categorization. Oh, that's just a bus going by. Or: Oh, that's just my wife! The habit of rushing to a secure identification means that we can ignore much of the detail that could make those experiences more novel or interesting (stereotypically, we fail to notice a new hair-style or pair of spectacles). I am certainly aware, at the end of a week's meditation retreat, that colors are brighter, sounds sharper, and food tastier than it was before.

The practice of trying to maintain focus on some particular body sensation—often the feeling of the rise and fall of the chest and abdomen as we breathe, or the slight sensations of touch and temperature as air flows in and out of the nostrils—gradually helps to retrain the skittery nature of attention, and strengthens our ability to maintain a more constant focus. The butterfly nature of much mental experience can be one of those defensive strategies that prevent us from noticing what we don't notice. Constantly surfing our own experience, we don't stay anywhere long enough to subject a particular moment to any degree of scrutiny.

As these new habits begin to take hold, so the processes involved in the unfurling or welling up of experience become more visible. We can begin to notice the hand that has been slipping in the salt. This potentially has the same kinds of benefit as therapeutic interactions such as Cognitive Behavioral Therapy (CBT). People who are prone to depression, for example, often do not notice (or if they do, do not question) the "little voice in the head" that threatens to turn an instance of fallibility into a profound indictment of one's self-worth. "I forgot your birthday . . . Again . . . there you are, you see: further proof that I am a selfish and unreliable friend . . . How could you like someone like me? Actually you probably don't . . . you probably just feel sorry for me . . . That's what I am—pitiful . . ." Mindfulness training is proven to be successful at cutting off this downward spiral by enabling a person to bring these generalized and destructive self-judgments to light and reframe them as "passing mind-chatter . . . an old tape that might have been relevant once, but which I neither need nor deserve any longer . . ." (Teasdale et al. 2000).

Being able to "catch" your experience earlier can also help to prevent the over-hasty conversion of the holistic "felt sense" of an issue into a familiar, rather

formulaic, description. American philosopher and psychotherapist Eugene Gendlin has investigated this process of heeding the embodied felt sense at an earlier stage, staying with it, and allowing time for fresh words to emerge that do better justice to the tangle of feelings that may be there (Gendlin and Rychlak 2000). He has found that clients who make good progress in resolving issues in therapy are often able to sink into this kind of meditative thinking, while those who stay stuck tend to trot out their "stories" with greater speed, clarity, and certainty. Such stories may be self-justifying (and often are), but they do not evolve or explore, and so they do not help you to make progress. Gendlin has also found, however, that this knack of attending slower and earlier, which he calls *focusing*, can be taught, and has demonstrable benefits. Mindfulness practice is not identical to focusing practice, but the attentional habits that mindfulness develops are of great use in the context of fruitful exploration of vexing personal issues.

Gendlin has found that a similar shift in attitude toward the products of one's own mind is also conducive to more intellectual kinds of creativity (Gendlin 2004). He calls this process "Thinking at the Edge" (TAE), and again has shown that this can be taught to good effect. The core process is similar to focusing: One stays patiently with "an issue about which you know you have something to say, but for which you do not yet have adequate words," and allows different formulations to arise, which are constantly checked back against the underlying embodied sense of the issue. Both focusing and TAE cultivate the ability to allow the fern of embodied meaning to well up at its own speed, rather than rushing to neaten it up—and thereby losing some, or maybe all, of what was fresh and valuable in the thought.

These shifts in attention also bring with them a greater tolerance for, and interest in, ways of knowing that are not clear-cut and logical. Hunches and inklings are more likely to be heeded, and given time to unfold, by a mind that is not impatient for clarity and certainty. The poet John Keats called this attitude "negative capability," and described it as "when a man is capable of remaining in doubts, mysteries and uncertainties, without any irritable reaching after fact and reason" (Keats 1969). We know that (a) intuitions are often wrong, and (b) they often contain valuable seeds of creative ideas, so they need to be treated with a mixture of caution and credence. We also know that logical reasoning (a) often leads to stupid conclusions, because in order to make logic work, you have to leave out an awful lot of details, some of which may turn out to have been crucial, and (b) often leads to valuable conclusions and predictions, so . . . ditto (Claxton 1997). Mindfulness increases intelligence, we might argue, by encouraging a more accurate and balanced view of our ways of knowing. Instead of explicit rational thinking being the cuckoo in the nest, trying to hoof out all the

other ways in which our interior signals to the exterior what is going on, we are able to accept and heed them all— adjust spacing thinking, feeling, imagining, acting, intuiting—as all being both potentially valuable and potentially flawed.

The effects of meditation on perception and creativity are nicely demonstrated in a study of the reaction to Rorschach images by two groups of experienced meditators by Daniel Brown and Jack Engler (1984). One group had been developing the ability to keep attention fixed for long periods on a physical stimulus, without their minds wandering. When asked "What do you see in the pictures?" this group gave detailed physical descriptions, but very few associations. By contrast, the group who had been developing open, accepting mindfulness—just watching the meanderings of their own minds without judgment or restraint—gave dozens of bizarre, and sometimes taboo, reactions to the pictures, but with great humor and equanimity. Their reaction was, "Well, it's just my mind at play; why should I get upset about it?"

In general, mindfulness seems to enhance this kind of equanimity. One is able to observe the shenanigans of one's own mind without either "attachment" or "aversion" (as Buddhists would put it). Instead one can be just interested, amazed, and often amused by its firework display. Indeed, because "self" and "conscious experience" are both seen as aspects of a spontaneous process of welling up, the sense of being an observing (or instigating) self itself wells up just as much as the content of consciousness does. The sense of an abiding self who tries to own or control the rest of the mind is replaced by a feeling that both self and mind arise simultaneously out of a deeper, larger, and in some ways more impersonal process. So the fear of being "let down" by one's own mind, and of having to guard against the awful possibility that Freudian leaks will betray you to your neighbors, begins to melt away somewhat. The endless battle between Ego, Super-ego, and Id runs out of steam as they all wearily admit to being fictitious, and a kind of fond or gently ironic humility replaces it, due to the fact that you know your world to be substantially based upon a tissue of assumptions, all of human construction, and all capable of being contested. There is a sense of being more at home in (and with) a view that embraces more fluidity, multiplicity, and uncertainty. Alan Watts once wrote a book called *The Wisdom of Insecurity* (Watts 1954). It is that kind of wisdom that mindfulness practice seems to offer.

Last, and most importantly, mindfulness seems to lead to a recapturing of greater closeness, kindness, and tolerance for other people, as well as ourselves (see Brown et al. 2012). I say "recapturing" because this mixture of intimacy and care seems to be innate. Young children are naturally empathic, altruistic (up to a point), and helpful (Svetlova et al. 2010). Apparently we are designed to be part of what Jerome Bruner once called the web of social reciprocity (Bruner

2006; Trevarthen and Aitken 2001). The science of embodied cognition has generated a lot of research on the multiple (but often unconscious) ways in which we are connected to each other "below the waterline," so to speak (e.g. Thompson 2007). But as we grow up, and the self comes to seem more real, and its complicated plexus of self-related concerns and anxieties more urgent and intractable, so those natural virtues become things we need to remind ourselves to value, rather than things that just well up when called for. As mindfulness does its lubricant and solvent work, so those virtues, in abeyance but seemingly not lost, come forward once more and play a larger part in our portfolio of felt concerns.

Conclusion

With a few conspicuous exceptions (such as the work of Teasdale and Chaskalson 2011a,b), research on meditation has not linked as strongly as it might with research on cognitive science and the study of consciousness. This is partly because some of the most common core metaphors for thinking about conscious experience—the central executive, the computer operator, and the spotlight—do not seem to offer much of a purchase on the processes, experiences, and outcomes that are associated with meditation. In particular, they have no obvious role for acquired habits, especially habits of attention, in constructing conscious experience, so it is less clear in those models exactly what psychological processes are undergoing change through meditation, and how that change happens. Nor do they suggest how experiential and behavioral change might be linked. The metaphors of unfurling and up-welling, however, seem to offer promising avenues of enquiry in this regard. In particular, we have identified a variety of attentional and perceptual habits that might be involved in creating the unsatisfactoriness (*dukkha*) of experience that brings people to meditation in the first place, and which also seem amenable to alteration through the practices of meditation. On the view I have sketched here, we seem to have the beginning of an explanation as to how mindfulness can contribute to making people kinder, more relaxed, more creative, and more perceptive. As the Buddha might have said, "What's not to like?"

Personal Meditation Journey

I remember when I was an undergraduate at Cambridge going to a talk in Trinity College about transcendental meditation given by a graduate student. I was intrigued, not

least because this chap, whose name I have long forgotten, was studying chemistry, like me. I think I was reassured that, if another chemist (tweed-jacketed and quite nerdy; I do recall that) was interested, it couldn't be too wacky. (I now know that this touching faith was quite false, and that physical scientists are if anything more prone to believing weird things than your average bear.) Never one to rush in, it was two years later when I presented myself, a clean handkerchief and two pieces of fruit, at a house in Oxford and was given my secret TM mantra.

I didn't stay with TM long—I liked the practice but not the organization. After my D.Phil. I moved to London and got involved in all kinds of personal development pursuits—encounter groups, the *est* training, you name it—and started doing meditations at a center in Chalk Farm called Kalptaru run by followers of an Indian guru named Bhagwan Shree Rajneesh (as he was known then, later Osho). Bhagwan had become the sort of patron saint of many of the therapists I'd worked with and admired. I'd motorbike over from my flat in South Kensington at 6 o'clock in the morning to do "dynamic meditation," which was about as far from sitting sedately on a cushion watching your breath as you could get. There was wild music and you wore a blindfold and danced chaotically and cathartically for three-quarters of an hour, and then on the gong you froze where you were and stood in silence for ten minutes . . . and then finished off with a gentle floating dance to bring you back. I loved the physicality and the contrast between the wildness and the stillness.

(Bhagwan was of the view that Westerners had such busy minds that it was impossible for us just to sit still—you had to expel the accumulated thoughts and concerns through physical activity before you could really enter silence—and I certainly found that to be true. He also said that too many people tried to use meditation as a short-cut to escaping from neurotic patterns, and that was a misuse. I've certainly found that lots of retreat-goers—myself included—are in flight from unwelcome realities. A kind of superimposed equanimity isn't worth much.)

Then I'd go and have a bacon sandwich and a coffee and go to give lectures at the University of London. I ended up "taking *sannyas*," as it was called, which meant becoming a follower myself, and making trips to Bhagwan's ashram in Pune, India. He developed a controversial reputation, but it was all good, emotionally-releasing stuff for a rather uptight, clever Englishman, and when I disrobed seven years later it was with nothing but gratitude and good memories. But I had got fed up with the uniform. You had to wear "orange", which, in those days, included everything from brown to pink.

It wasn't all wild; I remember doing a classical silent ten-day *vipassana* retreat on the roof of a mansion near the ashram. Something of that must have got into my blood

(along with a lot of itchy chemicals from the clouds of mosquitoes feasting on us), because I moved, over the next few years, from the white-water rides of *sannyas* into an exploration of many different Hindu, Sufi, and especially Buddhist forms of meditation. I did Zen retreats with Maezumi Roshi and Thich Nhat Hanh; Tibetan retreats with Sogyal Rinpoche and Namkhai Norbu; *vipassana* retreats with Christopher Titmuss and Sharon Salzberg; and one wonderful retreat in Devon with Ram Dass, who epitomized for me the synthesis of the red-blooded, iconoclastic aliveness of Bhagwan and the authentic peace of the best Buddhists. I never joined anything for long, but I learned a lot along the way, and ended up with a simple, open mindfulness practice that I do in odd moments. I still have a zafu and a cushion in my office at home, but rarely use them. I like to think it has all seeped somehow into my bones and given me a richer register of ways of being an ordinary human being than I had when I was the cocky, clever, callow young man who went to that talk in Trinity.

Acknowledgments

References

Baddeley, A. D. (2007). *Working memory, thought and action.* Oxford: Oxford University Press.

Barrs, B. J. (2005). Global workspace theory of consciousness: Towards a cognitive neuroscience of human experience. *Progress in Brain Research*, **150**, 45–53.

Blackmore, S. (2003). *Consciousness: An introduction.* Abingdon: Hodder and Stoughton.

Brown, D. and Engler, J. (1984). An outcome study of intensive mindfulness meditation. In W. Muensterberger, B.Boyer, and S. Grolnick (Eds.). *Psychoanalytic study of society*, Volume **10**. Hillsdale, NJ: Analytic Press.

Brown, J. (1991). *Self and process: Brain states and the conscious present.* New York: Springer-Verlag.

Brown, J. (1999). Microgenesis and Buddhism: The concept of momentariness. *Philosophy East and West*, **49**(3), 261–277.

Brown, P. M., Corrigan, M. W., and Higgins-D-Alessandro, A. (Eds.) (2012). *Handbook of pro-social education.* New York: Rowman and Littlefield.

Bruner, J. S. (2006). *In search of pedagogy.* London: Routledge.

Bucci, W. (2011). The role of embodied communication in therapeutic change: A multiple code perspective. In W.Tschacher and C. Bergomi (Eds.). *The implications of embodiment: Cognition and communication.* Exeter: Imprint Academic.

Carmichael, L., Hogan, H. P., and Walter, A. A. (1932). An experimental study of the effect of language on the reproduction of visually perceived form. *Journal of Experimental Psychology*, **15**, 73–86.

Chemero, A. (2011). *Radical embodied cognitive science*. Cambridge, MA: MIT Press.

Clark, A. (2013). Whatever next? Predictive brains, situated agents and the future of cognitive science. *Behavioral and Brain Sciences*, **36**(3), 181–204.

Claxton, G. L. (1997). *Hare brain, tortoise mind: Why intelligence increases when you think less*. London: Fourth Estate.

Claxton, G. L. (2005). Mindfulness, learning and the brain. *Journal of Rational-Emotive and Cognitive-Behavioral Therapy*, **23**(4), 301–314.

Crick, F. (1984). Function of the thalamic reticular complex: The searchlight hypothesis. *Proceeding of the National Academy of Science*, **81**, 4586–4590.

Damasio, A. (2011). *When self comes to mind*. London: Vintage.

Doucleff, M. (2012). Anatomy of a tear-jerker. *Wall Street Journal*, February 11.

Edelman, G. and Tononi, G. (2000). *Consciousness: How matter becomes imagination*. London: Allen Lane.

Friedman, T. L. (2014). How to get a job at Google. *New York Times*, 22 February.

Gendlin, E. (2004). Introduction to thinking at the edge. *The Folio*, **19**(1), 1–5.

Gendlin, E. and Rychlak, J. (2000). Psychotherapeutic processes. *Annual Review of Psychology*, **21**, 155–190.

Goleman, D. (1985). *Vital lies, simple truths: The psychology of self-deception*. New York: Touchstone.

Hamilton, V. (1983). Information-processing aspects of denial: Some tentative formulations. In S. Breznitz (Ed.). *The denial of stress*. New York: International Universities Press.

Johnson, S., Marro, J., and Torres, J. J. (2013). Robust short-term memory without synaptic learning. *PLoS ONE* **8**(1): e50276.doi:10.1371/journal.pone.0050276.

Kalupahana, D. (1987). *The principles of Buddhist psychology*. Albany, NY: SUNY Press.

Keats, J. (1969). Quoted by Scott, N. *Negative capability: Studies in the new literature and the religious situation*. New Haven, CT: Yale University Press.

Kinsbourne, M. (1997). What qualifies a representation for a role in consciousness? In J. Cohen and J. Schooler (Eds.). *Scientific approaches to consciousness*. Mahwah, NJ:Erlbaum.

Krashen, S. (1982). *Principles and practice in second language acquisition*. Oxford: Pergamon Press.

Libet, B. (1982). Brain stimulation in the study of neuronal functions for conscious sensory experience. *Human Neurobiology*, **1**, 235–242.

Martindale, C. (1995). Creativity and connectionism. In S. Smith, T. Ward, and R. Finke (Eds.). *The creative cognition approach*. Cambridge, MA: MIT Press.

McNeill, D. (2005). *Gesture and thought*. Chicago: University of Chicago Press.

Parfit, D. (1986). *Reasons and persons*. Oxford: Oxford University Press.

Shanon, B. (2001). Against the spotlight model of consciousness. *New Ideas in Psychology*, **19**, 77–84.

Svetlova, M., Nichols, S. R., and Brownell, C. A. (2010). Toddlers' pro-social behaviour: from instrumental to empathic to altruistic helping. *Child Development*, **81**(6), 1814–1827.

Teasdale, J. D. and Chaskalson, M. (2011a). How does mindfulness transform suffering? 1: The nature and origins of *dukkha*. *Contemporary Buddhism*, **12**(1), 89–102.

Teasdale, J. D. and Chaskalson, M. (2011b). How does mindfulness transform suffering? 2: The transformation of *dukkha*. *Contemporary Buddhism*, **12**(1), 103–124.

Teasdale, J. D., Segal, Z., Williams, M. et al. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, **68**, 615–623.

Thomas, R. (2011). *Cast a yellow shadow*. New York: Open Road Press.

Thompson, E. (2007). *Mind in life: Biology, phenomenology and the sciences of mind*. Cambridge, MA: Harvard University Press.

Trevarthen, C. and Aitken, J. A. (2001). Infant subjectivity: Research, theory and clinical applications. *Journal of Child Psychology and Psychiatry*, **42**(1), 3–48.

Trimble, M. (2012). *Why humans like to cry*. Oxford: Oxford University Press.

Vingerhoets, A. (2012). *Why only humans weep*. Oxford: Oxford University Press.

Watts, A. (1954). *The wisdom of insecurity*. London: Hutchinson.

Wells, A. (2008). *Metacognitive therapy for anxiety and depression*. London: Guilford Press.

Werner, H. (1956). Microgenesis and aphasia. *Journal of Abnormal Social Psychology*, **52**, 347–353.

Chapter 4

Fish discovering water: Meditation as a process of recognition

James Carmody

Introduction

Forty-some years practicing in the three main Buddhist traditions and *Advaita*, together with teaching meditation and researching the psychological effects and neural mechanisms of mindfulness training, has shown me the need for a clear and parsimonious description of the attending processes associated with meditation practices that address psychological distress. In this chapter I have aimed for such a description: an uncluttered and jargon-free explanation using cultural constructs and principles familiar to non-practitioners. It is one I would have liked to have had access to when first introduced to practice.

To do this, I place the description in a broader context of human development and use the lens of natural selection pressures that have resulted in default and habitual vigilance-related attending processes serving the survival and safety-related needs of the social creatures we are. Central also in these processes is the sense of personal agency and ownership that has evolved along with a reflective capacity to imagine that things could be better for me than they are. The affective downside of this biological imperative is the sense of unease or dissatisfaction in the mind-body. Mind training practices used in the meditation traditions are designed to relieve this everyday malaise.

I then describe the psychological processes and principles that these skills draw upon and develop in supporting the recognition or regulation of these default attending processes, and the role these skills play in the cultivation of a more salubrious experience of everyday life. A number of ostensibly different meditation practices draw upon these generalizable principles, as do Western psychotherapeutic modalities; one or more of them can be seen at play in the arousal- and distress-reducing effects of the training exercises used in mindfulness, TM, mantra, tai chi, yoga, and reiki, as well as such psychotherapeutic modalities as progressive muscle relaxation, symptom monitoring, CBT, biofeedback, and loving-kindness.

To clarify terms, I describe two senses in which meditation "practice" is used in discussions of meditation and the unnecessary confusion created for beginners when these become conflated. I then go on to discuss the advantages of embedding the mechanisms by which meditation systems have their effect on stress/distress within this broader ecosystem of mind-body attending processes. It draws attention to the common processes in the training exercises of apparently disparate meditation traditions, demystifies the idiosyncratic language and terminology of specific modalities, and highlights the commonalities these traditions have with psychotherapeutic systems.

This approach provides the clinician with a useful conceptual coherence and a more synergistic understanding of the mental processes associated with various mind-body programs and the extent to which they can affect stress/distress. It also affords a few relatively simple principles clinicians can use to tailor explanations and presentations coherent with a patient's interests and background, so making the skills that meditation represents more meaningful, approachable, and accessible to the patient.

I end by raising issues I think are worth considering but that receive little attention in the meditation literature. These include the cultural and political values that derive from East Asian cultures that may remain embedded in meditation as it is taught and practiced in the West, and the assumptions often made about the effect that wider use of meditation may have upon the broader culture. Removing meditation and its mechanisms from traditional and dharma-related language and assumptions in this way also allows us to consider afresh the broader context in which it finds its place; to ask anew such questions as why we are not naturally at ease and why something like meditation is needed in the first place, and how it is that we do not recognize or remember the formation of the habits of attending that shape the valence of our lives.

I begin by considering these fundamental questions:

What is the origin of human angst? Why is ease not a natural condition of everyday life? Why should we even need something like meditation?

The experience of human suffering and angst has not unreasonably occupied human beings for millennia—probably since we developed the sense of an ongoing "I" with its accompanying existential dread and the capacity to imagine that things could be different for me than they are. And because our perception of problems is shaped by the analytic glasses through which we view the world, our imagined solutions also flow from the ascribed source of the problem.

Throughout much of history this suffering has been ascribed to one or more deities taking offense at our individual or collective behavior, and the methods and programs prescribed to appease these capricious animations in order to obtain relief have ranged from the somewhat reasonable to the bizarre. Episodically, however, more rational analyses ascribing suffering to naturalistic causes and effects have arisen.

During the time of the European Enlightenment, for example, critics focused on environmental deficiencies. These have included the system of education or parenting, the political institutions and systems under which we live, and the stressful economic and time pressures on family life that result. Such critiques gave rise to the enduring and familiar social/political movements that have become part of the accepted fabric of modern life.

Analyses ascribing the roots of suffering to individual and interior psychic processes also have a long history in both the East and the West, and were pervasive and enduring in South Asia. Among these, the Buddhist explanation was radically internal and firmly located the source of suffering in a fundamental ignorance of the way perceptions are shaped in the human psyche, with its attendant craving and downstream experiential fallout. Meditation, the term that has become a grab-bag of reflective practices designed to make this process apparent, was an integral part of a prescribed eight-faced escape route. But on the more fundamental question of why this ignorance-based misperception should be initially present in the psyche, the Buddhist analysis offers little more than the construct of karma.

Every age describes the psychic process in terms of the cultural beliefs, language, and constructs of the time. And, although the notion of karma can be a convenient story in addressing everyday unease, it amounts to little more than whatever happens does so for a reason also rooted in ignorance in some near or far personal past. Such a circular narrative provides little explanatory power in the face of the question of why the initial ignorance should be present and is unlikely to hold much water with skeptical minds. Questions such as this gain importance in our secular world, where the accessibility and coherence of the conceptual framework within which meditation is presented can make the goals and challenges a beginner may face in getting started more or less meaningful.

In this respect, evolutionary theory and the pressures that have shaped our organism, as well as advances in social science since the Buddhist psychic map was laid down, enable a framework that more broadly responds to the question of why, after so many millennia of evolution, we inhabit an organism so ignorant of its own fundamental psychic processes that, having attained adulthood, it requires an experiential educational recall.

The formative role of evolutionary pressures in everyday attending

Evolutionary theory allows us to consider and appreciate the body-mind as an ecological system developed in the service of meeting our human needs, the most primal of which are for survival and reproduction. And the advantages bestowed by some measure of safety in supporting survival has given rise to the attendant second-order social needs for relationships, power, and status that exert such entangled pressures, shaping the cooperative-competitive creatures we have evolved to be. Given that our senses and nervous system detect and process large amounts of possibly useful information, attention—the capacity to consciously experience some portion of this information—is vital in the system's design for meeting our needs.

This capacity to focus attending resources and give priority to parts of experience perceived as supporting, or having the potential to support, our human needs has clear survival value. And accomplishing this with reactive immediacy rather than through more slowly-operating deliberative cognitive functions bestows even greater value. Unfortunately, even as this automatic and rapidly moving attention serves its vigilance function by highlighting threats and opportunities for the satisfaction of needs, we experience an attendant downside in the affective realm.

The affective downside of these default attending processes

The experiential downside of these automatic movements of attention results from two associated features. First, its vigilance function means that attention's everyday focus is more or less threat-based. The second feature derives from the automaticity with which biological arousal levels follow the valence of the object of attention, meaning that the threat-based perceptions result in some measure of arousal-related bodily constriction. The feeling tone associated with these constriction- or tension-related sensations is to some degree unpleasant, with the degree of constriction-related unpleasantness depending upon both the perceived level of threat and our perceived capacity to deal with it.

These very rapid default movements of attention would not be a problem to our ongoing felt sense if the alerts were transitory and arousal naturally rapidly returned to a quiescent state. This appears to happen with animals in the wild, and possibly did for earlier hominids when physical survival was their primary concern. Survival in the face of immediate physical danger required attention to be predominantly awake to their senses and, the changing conditions of their bodies, and the physical surroundings (sights, sounds, tastes, and tactile and

kinesthetic sensations). The physical danger of the proverbial saber-toothed tiger was seen, arousal levels spiked, it was dealt with in some way, and arousal levels went down once again.

Today, with our needs for physical survival largely met through the institutions of society, concerns associated with the second-order social safety-related needs for relationships, status, and power have become predominant in our attention. And, unlike immediate physical safety, satisfying and maintaining these needs entails ongoing cognitive activity involving imagination and complex planning. Because these also depend upon the indeterminate behavior of others, even a momentary satisfaction is then threatened by changing circumstances. And so this cognitively-driven vigilance never stops; attention continues to scan for imagined threats and circumstances perceived as important in maintaining the need's satisfaction.

The result of attention repeatedly defaulting to, and dwelling upon, threat-based themes is some degree of elevated arousal, its accompanying measure of muscular tension, and the attendant less-than-pleasant sensations of constriction. The everyday rub, then, of this gift to our survival is that we rarely feel completely relaxed and at ease in life, and at times experience the intense mental suffering that can result from this tendency.

Recognizing these threat-based themes in everyday angst

These default mind-body processes can be recognized experientially by noticing where, and to what, our attention goes from moment to moment. When unregulated, or not required for the completion of some physical task, attention rarely rests upon immediate sense impressions and bodily sensations. Rather, it defaults to cognitions: thoughts about these and a myriad other things. And our social safety-related needs for relationships, status, and power mean those thoughts often concern the welfare of family and friends, whether we are in some way loved or sufficiently loving, or livelihood and money. This concerns-based cognitive commentary is experienced as the internal monologue.

Based in memory and imagination and often only peripherally related to sensory function, the internal narrative relentlessly plans, seeks, compares, judges, and regrets. Its needs-related function is seen in those emotionally-tinged thoughts and images experienced as concerns, worries, and transitory joys about family and friends, work, money, and one's own social standing. Attention preoccupied exclusively with this cognitive monitoring is experienced as rumination.

The power of the biological imperative driving attention's vigilance role in this way can be experienced when we attempt to bring some degree of self-regulation

in the face of these processes. For although we have the capacity to deliberately bring attention to many parts of experience, attempting to keep it on one consciously selected object makes its own persistent intentions apparent.

Meditation practices cultivate mindfulness of this dilemma

Meditation practices are designed to bring awareness to and/or modify these default mental processes; to become mindful of them dwelling on threat-based themes and the resultant less-than-pleasant felt sense characterizing so much of life. Unsurprisingly, then, these practices usually begin with an attention-related exercise. We may, for example, be asked to direct attention to the sensations of breathing and to keep it there. But despite our resolve, we notice that within seconds it shifts to some other facet of experience; a phenomenon we refer to as a wandering mind.

Wandering is a misnomer, however, for it implies no clear destination. And if, instead of taking the wandering designation for granted, we become curious about what our "wandering" attention moves toward and what drives it to move in this automatic way, we begin to experientially understand the role this wondrous capacity plays in supporting our lives and the biological imperative that drives it. We begin to experientially recognize something of the ecology of our minds. This improved understanding allows us to be more sympathetic toward it and to work with it more skillfully, rather than regarding it as just an unfortunate obstacle we must train or in some way overcome in order to "meditate."

However, before discussing further how meditation practices support dealing with these default processes, it would be as well to specify the way in which I am using the terms "meditation" and "practice".

Clarifying the terms "meditation" and "practice"

One of the issues this volume will no doubt grapple with is the wide-ranging uses of the term "meditation" and their associated connotations. In both popular and scholarly literature these extend from evoking the supernatural, spiritual, mystical, and exotic, to the more mundane experience of a quiet moment listening to music or taking in a landscape, or quietly thinking about something. Each of these uses of the term attracts some people.

As a jumping off point I use the Wikipedia definition of meditation: "a practice in which an individual trains the mind or induces a state of consciousness either to realize some benefit, or as an end in itself." It is a useful starting point because it is bare and unadorned and does not attempt to describe and define the possible benefits or states of consciousness. I like it also because it places

"practice" upfront and artfully goes on to describe two different meanings of practice that can be used in reference to meditation.

In the first meaning, meditation practice is used in the sense of "I'm practicing my jump-shot to get better at it during a real game." In the other it is used in the sense of "I'm practicing my profession, having preceded this with an apprenticeship during which I gained competence in the skills it entails and which I now execute with expertise."

While these two meanings of practice overlap and intertwine, either explicitly or implicitly, both academic and popular writing and instruction on meditation refer to practice in both senses and in ways that are not often made clear. Sometimes also they are conflated, with an apparent or stated assumption that the meanings are not in fact different or fruitfully distinguished between, invoking catchphrases such as "not doing," "no effort," or "just being." But invoking paradox to explain away the apparent and sometimes obvious contradictions in these ways of approaching meditation is not helpful to those first approaching the field, even in the interest of pre-empting a beginner's tendency to separate "life" from "practice." Rather, making the distinction clear in instructions can be useful for beginners, especially in clinical settings. For, as I discuss below, the psychological processes involved in each sense of the word are different in important ways, and competent instruction can fruitfully support the development of each.

I focus initially on the first sense of meditation practice as "practicing my jump-shot to get better at it during a real game". I describe the psychological processes activated by the attending skills embedded in the beginning instructions commonly used in a variety of meditation traditions, and the connection they have with the experience of distress and well-being. I then go on to discuss the second sense in which meditation practice is used, as in "practicing my profession with expertise, having gained competence in the skills it entails," by describing the recognitions that can be established as a result of this kind of attending and the effects these too can have in everyday life.

Meditation as "practicing my jump-shot to get better at it during a real game"

In order to meaningfully describe the psychological process through which mental distress is experienced, and the process by which the practices people are usually asked to do under the name of meditation address these, it is useful to recall the three phenomenological components that Buddhist analysis incisively lists as comprising experience. These are sensations, cognitions, and the pleasant/unpleasant feeling tones associated with those. Everyday experience and emotions are a symphony of the interplay of these most fundamental experiential elements.

Fearful
Thought/Image

Sensations of   Unpleasant
Constriction   Feeling Tone
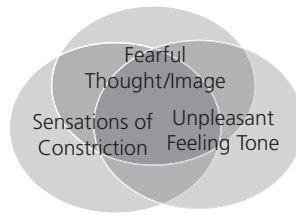
Fig. 4.1 Components of experience are undifferentiated experience appears seamless.

In its vigilance function unregulated attention maintains distress-related cycles of association
'I feel tense/anxious all the time... This is who I am'

While this seems straightforward enough, for reasons I discuss below, a feature of the root ignorance referred to earlier is that these components are not usually recognized as differentiated in everyday experience. And to make things even more difficult, they are locked in apparently seamless, conditioned cycles of association; these can start with any of the components. For example, a thought may be associated with a particular feeling tone and bodily sensation. The sensation then reminds us again of the thought and off the cycle goes, sometimes for lengthy periods.

Figure 4.1 illustrates one of these cycles operating in the experience of worry. An alarming thought is associated with some sensation of bodily constriction, which results in an unpleasant feeling tone; the unpleasant feeling tone then reminds us again of the thought. This undifferentiated and distressing cycle forms and reforms millisecond by millisecond and, by compelling attention in its adapted vigilance function, becomes self-sustained, sometimes for hours.

So how do the mental tasks people are asked to perform in "meditation practice" as a "jump-shot" result in experiential benefit in the face of the psychological processes sustaining the dilemma illustrated in Figure 4.1? They are actually familiar psychological mechanisms.

The initial and fundamental practice used in many meditation traditions is to introduce some measure of control of attention by directing it to a specific sensation, thought, or feeling; in meditation parlance these are called mental events or objects. This may involve attending to bodily sensations such as those of the breath, the kinesthetic sensations of a sitting posture or sequence of movements, the aural sensations of a mantra, the visual sensations of an image, or a specific thought or feeling. In learning to attend to them singly, or in combination, the components comprising experience are explicitly or implicitly recognized and differentiated, so creating an opportunity for some measure of self-regulation. This is illustrated in Figure 4.2.
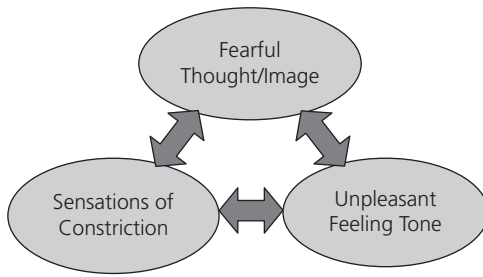
Fig. 4.2 Opportunity opens for self-regulation as components of experience are recognized as differentiated and connected.

This is not done with the intention to push the experience away but to recognize it for what it is and how it is created. A profound acceptance is implicit within this recognition.

Next, the deliberate re-direction of attention from its default predilection toward an arousal-neutral mental object interrupts the conditioned cycle of association maintaining distress, and sets up a more arousal/affect-neutral cycle. This is illustrated in Figure 4.3.

The process of differentiation of the components of experience, and recognition of their nature as mental phenomena, is sometimes supported by mentally labeling or noting these events as thoughts, sensations, or feelings as they are occurring. Attention is usually directed toward the content or meaning of the components and their conditioned associational cycles as in Figure 4.1. Bringing attention instead to a cognitive evaluation of their nature as events in the mind draws attention from their distress-maintaining content or meaning, while simultaneously functioning as an arousal-neutral evaluation of them. This is sometimes called meta-awareness.

This, then, is the generic mechanistic picture of the psychological nuts and bolts of meditation practices as they affect everyday arousal levels. Feedback from clinicians attending my courses on introducing mind-body principles into clinical care indicates the utility of these principles as a conceptual
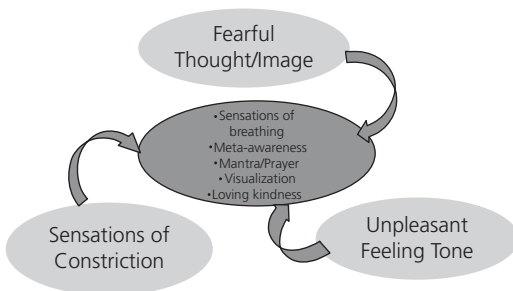
Fig. 4.3 Conscious redirection of attention to chosen affect-neutral/positive object of attention interrupts cycle and forms a new more affect-neutral or positive cycle.

framework for both beginning the clinicians' own experience of mindfulness and mind-body practice, and in presenting and teaching these to their patients within the time constraints of a typical primary care appointment.

John Lennon once wrote that life is what happens to us while we are busy making other plans. And given that so much of life is spent with attention preoccupied by infinitely varying combinations of these angst-inducing cycles of mental components, it is useful to ask why the process is not ordinarily apparent to us. Why should we need to undertake these kinds of remedial classes?

Why these angst-inducing patterns of attending are not ordinarily apparent to us

In considering the question of why these kinds of mental exercises should be needed to support recognition of these patterns and habits of attending that shape so much of our felt sense of everyday life, it is useful to reflect on the way we attend when we first come into the world, and how this incrementally changes during development. As any parent can attest, we start off as sensate creatures; attention focuses on bodily sensations—touching, tasting, hearing, seeing, and their pleasant and unpleasant feeling tones. Parents get to hear loudly when it is unpleasant. As language and socialization develop, cognitive processes become gradually integrated into the perception of sensations and feelings, and woven into the fabric of the emerging "I"; an implicitness that makes them inaccessible through the usual processes of memory recall, and so invisible to us. In this way, these patterns become the everyday water of experience we swim in and are not noticed in the way water is invisible to a fish.

The developmental process of this moment-to-moment forming and reforming of conditioned perceptual mental processes implicitly shaping our felt sense in the everyday world can be illustrated through the parallels it shares with the process of learning to read. When, as adults, we see a sentence such as "The cow jumped over the moon," some thought or image is immediately created in our minds, probably involving a cow and the moon. We are not consciously aware of the process of recognizing the letters and their combinations as words comprising the sentence—it has become automatic. We may not even be consciously aware that we are reading. But of course we did not start off with this immediate recognition. Rather, we went through a painstaking process of learning letters and how they combine to form words that can then be joined in sentences to abstractly represent the world and our experience of it.

Meditation practices are designed to help us recognize perceptual processes that have become as automatic as reading. To torture the metaphor a little further, they help the practitioner to recognize that everyday experience is

comprised of sentences constructed from the letters that are fundamental components of experience: thoughts/images, sensations, and their pleasant/unpleasant feeling tones. Meditation practices support this recognition in three interconnected ways: (1) cultivating curiosity about how the valence of experience is constructed from moment to moment—without this interest the rest does not follow; (2) experientially recognizing and discriminating between the components comprising experience and the near-immediate formation of their closely associated conditioned cycles; and (3) developing some capacity for self-regulation of attending in the face of this.

Before going on to the second sense in which meditation practice is used, it is useful to consider for a moment the widely varying goals people have in mind when approaching meditation and how these variations may shape the way it is described and approached.

Practitioners use meditation to suit their individual purposes and interests

People approach meditation with different levels of interest and with diverse aims and ends in mind. This has been true throughout its history. In the clinical context a person may be satisfied with learning to direct their attention to the sensations of breathing or a mantra in a way that interrupts attention's preoccupation at times of stress. Or through something like the body scan, hatha yoga, or tai chi they may discover greater delight in everyday life as a result of attention being less preoccupied with the vigilance-based cognitive process and more attuned to their bodily/sensory experience. Still others will make skillful use of the associational cycles of thoughts, sensations, and feelings to cultivate a preferred suite of these as in *metta* (loving kindness) practices, affirmations, and prayer. Most people probably use some combination of these. Some also are interested in ideas of enlightenment, transcendence, and spirituality and this leads into the second sense in which meditation practice is used in the working definition.

Being vigilance-based, the cognitions associated with seeing are often associated with some degree of arousal. But occasionally, circumstances are such that we find ourselves in a situation where the thought associated with vision stops, such as when a beautiful sunset or the face of a child captures our undivided attention, and wonder and awe naturally come to the forefront. These were always available behind our preoccupation with the cognitions. Meditation then becomes about bringing curiosity to the everyday process by which this occurs so that the experience of awe and wonder is less dependent upon random circumstance and becomes part of our everyday experience. Both the

exercises and the curiosity are needed; without the exercises, the curiosity tends to become once again preoccupied with cognitions about the process and so more of the same. And without the curiosity, the exercises become an end in themselves with little spill-over into everyday life. This brings us to meditation practice in the second sense.

Meditation practice in the second sense

As described in the first sense in which meditation practice is used, the training exercises result in some level of recognition; the extent and depth of this will vary according to the kind of interest the practitioner brings to it and their level of ongoing curiosity. Some will be satisfied with recognition of the automatic perceptual processes and the capacity to redirect their attention to an affect/arousal-neutral mind object and the accompanying reduction in distress. Others will have gained a deeper awareness of these ongoing mental processes and will remain curious to take the enquiry further.

This is meditation practice in the sense of "I'm practicing my profession, having preceded this with an apprenticeship during which I gained competence in the skills it entails, so that I am now able to execute them with expertise." This second sense of practice is often regarded as its original intent, and the many forms it takes are shaped by the culture and traditions within which the person developed their attending skills and also their temperament; factors that are themselves probably not unrelated.

Cognition is the most challenging mental component to recognize clearly since, as I described above, it is intimately and implicitly woven into the fabric of experience and identity. And so, while the most obvious thoughts, such as "Mary is wearing a red dress" or even "I'm noticing a fearful thought," are readily observed and labeled, the more subtle cognitions also become more and more apparent as the enquiry proceeds, including into that of "practitioner" and "observer-noticer."

Experience through practice in this sense also makes apparent the essential translucency of cognitions as mental phenomenon; a recognition that results in attention no longer being automatically captured by their content—what they are about or mean. As a result, attention's preoccupation with the cognitive processes of memory and imagination, which often prevents us from seeing things and people with freshness and curiosity, is undermined. Recognition of the tyranny that ruminative preoccupation has been exerting over life, perception, and well-being is a great release; cognition can now be engaged with, or not, as the situation merits. The person is using thought instead of being used by it.

Happily, this recognition is a lasting change; lasting in the way a fish's relationship with water might be permanently changed when, having being taken out of the water for an instant, it is returned to it. The fish has no organ for the perception of water; it was born into it and can only see things within water; recognition comes through its momentary absence, opening the mind to awe and wonder. Some will be satisfied with the greater freedom and enjoyment deriving from this.

Those curious to investigate further may engage in a more penetrating investigation into the "I"-ness of things—the sense of ownership of I-related experience and the moment-to-moment creation of the sense of personal agency. Here a more contemplative approach is required, since every attempt to frame and investigate the question cognitively leads back into the familiar territory of memory and imagination. And instructions, being language-based, inevitably lead into the same cul-de-sac of infinite cognitive regress. Zen literature is replete with stories of teachers attempting to bypass this dilemma as they try to foster the particular kind of interest and curiosity required in their students.

Meditation practice in this sense leaves behind canonical vessels and approaches the pathless referred to in a number of traditions. The direct experience emerging from this kind of enquiry bestows clear, and at times jaw-dropping, recognition of how the world as we know it is created and that "mind" is the name we give to our interpretive experience. When meaning imbues everything, words like "spiritual" become redundant; even time past and future is recognized as a creation of memory and its partner imagination.

The difference between the two approaches to practice may be summed up in the following way. The first recognizes the principles and rearranges the components of the cycles so that they are more salubrious (less arousal-inducing), even if the cycle is one that assures one that this is passing and you can just "watch it." The second seeks to undermine even this perceptual cycle by transferring interest to the knowing itself. As such, it encompasses a more penetrating interest and curiosity in addition to the cultivation of attending skills. That which knows begins to become of more interest than that which is known and deep levels of satisfaction and peace integrate themselves into everyday life as a result. Nothing in the world encourages this shift in interest—in that sense it is truly unworldly.

The qualities of presence

As the narrative meaning of mental contents (thoughts, sensations, feelings) arising in awareness no longer automatically compels attention in the old way, the presence of awareness itself becomes intuitively recognized. Awareness cannot be perceived or cognitively apprehended; perception and attention are designed only to recognize objects arising within it. It is an intuitive recognition,

accompanied by ease sweeping through the body-mind. I prefer the term "presence" to "awareness," which has established associations and meanings, although other people will have their own, different names for this.

A number of other previously masked features of mind become gradually or startlingly apparent with this recognition. Among these is that presence itself is imbued with qualities of meaning and peace, faith, gratitude, as well as joy— their companion and fellow-traveler—and a deep empathy for the suffering embedded in nature. We recognize how these were missed as interest and curiosity were instinctively preoccupied with the mental objects arising in this field; that the meaning and joy in the seeing itself have been apprehended through, and attributed to, the narratives and mental constructions reflecting them, and that the same preoccupation has diluted empathy and responsiveness.

As tribal creatures, this should not be surprising to us. Our adapted capacity for the cooperation upon which our very lives, and the lives of our children, depend is powerfully bound to and dependent upon our collective, and more intimate and personal, imagined narratives and stories; rich narratives of identity and connection that infuse our loving. These impulses, deeply-rooted in the more primitive past of our nervous system, also form the basis of ongoing human conflict and divisions and do not readily surrender their fascination to a more recent cerebral interest in reflective enquiry of unproven survival value. The elusiveness of freedom becomes apparent when just the suggestion that these are collective imaginings, albeit essential ones, and that they can be appreciated as such without compromising the relationships they suffuse turns out to be a bridge too far for many if not most.

The imagery and language used to describe this process of recognition and direct experience reflect the cultural ground and narratives that surround it, as well as the practitioner's beliefs and temperament. This is seen in the interpretive reflections contemplatives through the ages have offered around certain of these qualities. Buddhism refers to awakening, Plato in his enquiry refers to non-material ideal forms, Saint Paul to no longer seeing through a glass darkly, still others to the presence of god. The list is long and diverse. And while the initial descriptor is a more or less awkward attempt to allude to the unspeakable, the metaphors and processes described by the founders to approach it seem to inevitably gather a narrative of their own and we're off to the races again; preoccupied and fascinated by the narrative in a way that truncates curiosity, enquiry, and exploration, it becomes dogma and the basis for fruitless arguments among adherents.

Here I have presented a narrative using psychological and evolutionary principles that I hope rescue the process from sectarianism and ill-defined language and is less pandering to our emotional needs for certainty and identity.

The yin and the yang of it

Although the meditation training exercises are relatively simple and straight-forward in themselves, the act of practicing them does not appear to be of interest, or accessible, to all. Patient samples in my clinical trials of meditation-based programs are predominantly relatively well-educated white women. Likewise, women regularly comprise the majority of the courses I teach for clinicians. I've wondered why this should be. What makes it seem so less immediately attractive to men and other groups, and how could it be made more initially attractive? No doubt the sign on the door determines to a large degree who enters and is introduced to meditation. In this sense its portrayal in popular media of people sitting on cushions with their eyes closed has something to do with the very term meditation invoking an aversive impression of passivity and implicit receptivity, an image the ubiquitous sitting Buddharupa does nothing to diminish.

Interestingly, when I began practicing meditation some 40 years or so ago, interest was more evenly divided across the genders. In fact Zendos had quite a martial air that emphasized sitting through pain and discomfort, and getting by on less sleep. And some Burmese *vipassana* retreats included encouragement for retreatants to make a "firm resolve" not to move a muscle for increasingly long periods of sitting practice; as those periods went on, the silent air in the hall became increasingly charged and tense. And while *metta* practices were a part of other *vipassana* retreats, it was increased interest in Tibetan traditions and the centrality they placed on relationships and the feminine that has been largely responsible for the present emphasis in meditation programs on compassion and connection, and the introduction of terms such as tenderness and healing into the process. The veneration people feel for the Dalai Lama is no doubt related to that. On the other side of this emphasis on connection run the attempts to use meditation for what is referred to as the "spiritual bypass"; seeing it as a way of avoiding the complexity, ambiguity, and uncertainty these feminine qualities represent, and bypassing the necessity of resolving uncomfortable preoccupations that develop when internal conflict is present.

This situation refers back to the first part of this chapter and the discussion of the mind as a needs-meeting apparatus where the internal narrative functions as part of the cognitive apparatus serving that end. It is essential that the narratives through which we live our everyday lives are coherent, functional, and integrated with those of others in order to fulfill our obligations, and that they are seen as leading to goal satisfaction. Conflicting themes in the narrative and its surrounding life circumstances mean that attention becomes inordinately preoccupied with them as we attempt to find an internal coherence recognized

as leading toward the satisfaction of important needs, be they for relationships, status, or power. Attention, in its role of vigilance for opportunities for resolution, repeatedly returns to the conflicted narrative and its distress in such a way that it is unavailable for anything else.

While meditation can provide some necessary stability in the process of exploring and living through this, attempting to use it to bypass these interactive life tasks results in withdrawal into relentless concentration practice as an emotional analgesic that does not address the underlying problem. It becomes the role of something like psychotherapy to unveil the conflicting elements of the narrative and find some resolution. With its conflict reduced, the narrative no longer needs to preoccupy attention in such a compelling manner and interest is sufficiently available for other activities such as meditation practice.

It is the sense of seeking to undermine the very root of the internal narrative that most clearly distinguishes meditation from psychotherapy, which is generally aimed at altering some feature of the internal narrative, or resolving conflicts embedded within it that are perceived to be preventing the person from fulfilling their goals. As such, psychotherapy may at times be an essential adjunct to the process of enquiry.

Meditation occurs within a broader social and political landscape

As psychologists, we endeavor to map mental territory, and just as geographic maps reflect political territory, our mental maps also in some way reflect the tacit political and social priorities of the day. Likewise, meditation has always been something of a Rorschach test in the sense that each age understands, interprets, and utilizes it in ways that suit prevailing values and ideology. And so it remains in the twenty-first century; the dharma wheel is being re-imagined to take radial tires and chrome hubcaps. As evidence of the personal and health benefits that can derive from meditation practice becomes more widely discussed, it is finding an increasingly accepted place in mainstream health care. One result of this is the uneasy relationship between the internal and phenomenological investigation of meditation's practices and the external, sense-based empirical methods of assessing outcomes and mechanisms in Western clinical medicine.

Meditation programs are also being employed by some large companies with the aim of reducing stress and so increasing workplace productivity. It is even being introduced into explicitly political settings such as the British House of Commons. And while the assumption seems to be that these developments can only be an unalloyed good, it is worth considering the changing broader social, political, and economic landscape within which this increase in interest is

occurring. The rise in popularity of meditation-based stress reduction programs in health and business settings in the US in the 1970s and 1980s closely tracked falling middle-class incomes and rising levels of personal debt as people tried to maintain their standards of living. Even as these programs become more widely used, conditions and economic circumstances become increasingly dire for workers and families.

While it would be unreasonable to suggest that the use of meditation by an ever-increasing number of people could alone be expected to result in social and political change, it is worth critically analyzing and discussing the embedded values that may be associated with meditation practice and instruction and how these relate to the personal desires that create cultural or political change. Is there is a danger that these skills and world view just result in getting people to be more "productive" even if their pay does not increase along with this productivity, or result in coping better with conditions that, to initiate change, require resistance rather than acceptance?

The increasingly popular mindfulness meditation programs have roots in the politically passive and authoritarian societies in which East Asian Buddhism evolved and the social conditions in countries with long Buddhist traditions do not offer promising role models. Judeo-Christian traditions have, painfully and bloodily, evolved to be more democratic with ideals of justice, tolerance, and equality, and with solid ideas of sin; actions are seen as right and wrong rather than skillful and unskillful. So, as Buddhism-based meditation becomes more integrated into Western societies, it is worth examining without prejudice whether and in what ways the values that tolerate and support the societal structures in which it evolved may be present in the practice, the way it is taught, and its assumptions about change and well-being.

The contrasting roots struck me clearly in a venue in which I found myself teaching. A Buddhist organization had acquired what was once a Catholic monastery. The old chapel had been converted into the meditation hall and, while readily accessible Christian iconography had been removed, the stained glass windows in the clerestory depicted Christ and various martyrs in some form or another grimly shedding blood and dying. These images contrasted starkly with the imposing eight-foot Buddharupa dominating what had been the altar and depicting the Buddha sitting quietly with a beatific smile. And while bodhisattvas are at times depicted wielding weapons, these symbolize the slaying of ignorance, not other people. It is worth noting also that the Buddha was not politically radical himself; rather, he appears to have been a pragmatist, careful to cultivate the support of the rich and powerful.

Do such differences bear upon views of acceptance and compassion? The practice of refraining from changing experience is a cognitive stance adopted in

meditation practice. But acceptance can occur implicitly at a deeper level. In this understanding, when sensations or thoughts are recognized for what they are, and it is recognized that they will by their nature change of their own accord, the acceptance is implicit. At this level the cognitive/affective stance is recognized as a mental activity comprised of the components of experience. And while the dynamic quality of compassion is emphasized in meditation training programs, and studies show that exercises to foster self-compassion have a salubrious effect upon happiness, an assumption that this will impact the broader social and political fabric needs to be critically examined.

The principles of practice are straightforward even as the world is not

In this chapter I have endeavored to draw together some of what I have learned through the threads and circumstances of my own personal, professional, and scientific experience with meditation. I hesitate to ennoble the process by calling it a "journey"; it was more akin to muddling along in the face of confusion, incomplete knowledge, and spotty instruction. My object is to provide a conceptual framework that may be useful in understanding meditation in a relatively straightforward way; a description unencumbered by the narratives of religious traditions and instruction that often mask its essential simplicity by conflating the practices engaged to cultivate the ground for recognition and that which is recognized as a result of them. It is a description I think I would have found helpful.

In extracting and describing in this way some of the fundamental mental principles at work in the shaping of our experience of the world, and making a clear distinction between the relatively straightforward mental training exercises used to experientially recognize some of those principles in real time from that which can result from their practice, I do not mean to imply that the world itself is simple. But it does have a number of advantages.

First, it is easy for the actions and material objects related to the execution of the enquiry to become ritualized and/or fetishized, diverting and truncating the curiosity that is the heart of enquiry. This description appropriately transfers the mystique that the attending skills and dharma narrative associated with meditation practice are often given toward the mystery we find ourselves in. This does not exclude the skills and process from the mystery, but neither does it make precious the means by which the mystery is better appreciated.

Second, it values the cognitive function as an aid to penetrating into this mystery. Conflating meditation's means and ends can lead practitioners to undervalue their thinking function, concerned that it will just lead them further into the cognitive weeds and distract them from the real work of meditation, which

is often seen as beyond thinking, or stopping thought. Instruction in some tra-ditions repeatedly caution against "over-thinking things," invoking the Zen admonition to not mistake the finger pointing to the moon for the moon itself, as though attempting to think critically about meditation is to attempt to reduce the ineffable to the cognitive. Certainly the cognitive is slippery mental terri-tory to yoke, but any of our human functions that remain underdeveloped or under-utilized limits us in the enquiry; not taking full advantage of critical and analytic thinking only limits the resources available to us in penetrating to the heart of the question.

Third, it makes clear the distinction between meditation means and ends. Conflation of these contributes to confusion in discussions of meditation as it becomes popular in clinical and business settings. Here, people's initial curiosity is oriented in some way toward the goals of obtaining clinical or productivity effects rather than about the "I-ness" embedded in the perceptual process that interests long-term meditators in the Buddhist and other insight traditions; an interest that requires a deeper enquiry and level of understanding in the instructor. Nevertheless, terms and practices from one interest carry over into the other. For example, the common exhortation to 45-minute practice periods is a holdover from monastic traditions but without any evidential base for clin-ical or business settings. As such, this and other practices may serve only to make the process appear forbidding to some who might benefit from short periods of practice. Another example relates to my remarks above about the cautionary stance toward the thinking function, which results in beginners not being given a clear conceptual framework from which to approach meditation practice; this stance finds expression in the admonition that "it's best to learn this by direct personal experience." While this is undoubtedly true, the sign above the door is an important determinant of who enters and a clear explanation can arouse the interest of more than those with a high tolerance for ambiguity.

I have also raised some questions about the cultural values and assumptions that may be embedded in meditation practice as it travels and finds expression in Western countries. The iconographies and approaches to change are quite different and it is important to extract, examine, and discuss their implications without prejudgment.

Personal Meditation Journey

In 1961, I found myself travelling through India. It was a fortuitous series of events that took me there, and the vibrancy and chaos was jaw-dropping for a very young man raised as a Catholic in a small, remote, and provincial country.

Most memorable among the wonders was the sight of a stark-naked man walking nonchalantly along a crowded street. Just as remarkable was the minimal attention he drew. I learned he was a seeker of something called enlightenment. The idea fascinated me.

A year later, the Maharishi Mahesh Yogi, on a world tour, spoke at my university. He talked about the root of suffering, and meditation as a path to enlightenment. I was skeptical, but a friend who attended the practice session taught me what she had learned. And that was the start of it. Since childhood my interest has gone to how things work, the underlying causes, and here was something practical I could experiment with. I found the mantra meditation emotionally soothing for my turbulent emotional life, but it created more questions than it answered.

Something called yoga was also popular at the time and I found its claims intriguing also. Practical instruction was hard to come by, however. So, once again I headed off to India, this time to live in an ashram that offered yoga training. It was a demanding program but left unanswered questions.

While there I heard of a Burmese instructor who taught *vipassana* meditation courses and I travelled north to try it. The slender insight it provided into my mind captured my interest and offered a means to continue. I stayed on in the Japanese temple in Bodh Gaya taking instruction in Zen from the roshi. It was the start of a decades-long immersion in Buddhist practice that included long periods of solitary retreat.

Advaita's contemplative approach later provided a third leg for the stool and in making apparent the limitations of a path-based approach to meditation, facilitated recognition of the qualities of presence I allude to in my chapter.

Chapter 5

Psychology of meditation: Philosophical perspectives

Loriliai Biernacki

Veil'd Melancholy has her sovran shrine,
Though seen of none save him whose strenuous tongue
Can burst Joy's grape against his palate fine;
His soul shall taste the sadness of her might,
And be among her cloudy trophies hung.
Keats, "Ode to Melancholy"

Introduction

This chapter addresses the emergence of meditation as a practice and as a component of philosophical understandings of selfhood and subjectivity within the religious and philosophical discourses of early Hinduism, Buddhism, and Jainism. What I present here will offer only piecemeal contours of these traditions; a dim outline of what is an altogether far more rich reality than can be stitched together for this general work. I use as my linking thread for these multivalent, complex traditions an attention to psychology, in order to patch the inevitable gaps of this weave with what is the basic premise for the focus of this book: a psychology of meditation.

The psychology of meditation in these early contexts is fundamentally a phenomenology. This phenomenology aims to map and make sense of the inner experiences that arise from these early forays into introspection, as they become formulated, reflected-upon, and then sifted through contextualizing philosophical schemata. There is also, of course, no way that we can talk about a psychology of meditation without situating it within conceptions of selfhood. Self-reflection and introspection, hallmarks of meditation practice, necessarily come to bear on that most proximate object of one's reflection: the sense of self. This chapter will chart the evolution of an idea of a self through these early

Indian traditions of meditation, particularly noting historical development of a notion of self as a transcendent, abstracted ideal of self, separated from materiality. The formulation of a transcendent self also undergoes various permutations in this history, with, for instance, a Buddhist rejection of ideas of a self, and with Tantric attempts to reconnect the transcendent self to the body.

I begin with an overview of the major moments in these early religious traditions, and then analyze several important classifications for these Indian traditions historically, specifically as they relate to ideas of selfhood. I address these in roughly chronological order, beginning from the early period, called the Vedic period, through the rise of Jainism and Buddhism. Following this, I address the evolutionary trajectory that meditation practices and, with this, the formulation of subjectivity undergo with the advent of new forms of religiosity, namely devotional movements and Tantra. One interesting observation that this comparative analysis reveals is that while many of the same meditation techniques (e.g., visualization, use of mantras, body awareness) are employed across different religious traditions, nevertheless, the *interpretations* of the effects and meanings of meditation differ across the traditions. We may understand this as the historical over-coding that philosophy and doctrine exert on the formulation of conceptions of self in meditation. No doubt, there is also a mutual influence at work, with philosophy and doctrine shaping the results of meditation practice and at the same time, with insights from meditation reflecting back upon philosophical formulations of self. The final section of the chapter addresses a particular formulation of subjectivity within a Tantric meditative context, the sense of wonder, which is somewhat akin to the experience I relate in the section about my own experience of meditation.

By way of my own self-disclosure, I outline my personal sensibility, with my own particular biases, even as I acknowledge no real sturdy foundation for holding them: namely, my own sense that forms and formulations of meditative experience, at least regarding the psychological components of these, evolve as cultures evolve. Adhering more to a Darwinian conception of meandering, rather than a Hegelian notion of *aufheben*, my own predilection is not in line with a transcendental model of a divine spirit or an omniscient, omnipotent deity. This no doubt works against traditional Western notions of God, and works also against many Indian notions of both deity and ideas of a kind of untouched absolute, the *satcidānanda* of the *Advaita Vedanta* tradition of India, for instance. It could perhaps be argued that this sort of model of an emerging self through meditative practice might be amenable to a model of that pan-India pervasive concept of causality, karma. It might also be made to at least resonate with some forms of Indian philosophy such as Utpaladeva and Abhinavagupta's tenth- and eleventh-century ruminations on a dynamic emergence

of divinity. In any case, my own preference for a model of evolving meditative experience will influence the portrait I present.

Overview

It is probably fair to say that some of the very first systematizations of meditation in history—systematizations that are still utilized today—derive from the early writings of Hinduism, Buddhism, and Jainism dating back to the middle of the first millennium BCE (before the Common Era). The early writings of the *Ṛg Veda* in the centuries prior to this attest to what looks like meditation, with the *vipra*, the sage who would quake with insights and knowledge derived from perhaps the ritual, perhaps the *soma*, perhaps his encounter with gods like Indra, the thunder-wielding ruler, or Viṣṇu of the wide-step, or perhaps through his own transformative insight. Moreover, beginning as early as the seventh century BCE, Sanskrit writings in the *Upaniṣads* draw from meditation practices to theorize conceptions of cosmos and self. Early Buddhist writings in texts like the *Dīghnikāya* add to these early Indian reflections on the nature of the self and conceptions of subjectivity. Such Buddhist writings reflect what was claimed as the Buddha's seminal meditative insight: that the postulation of a self is a motivated fiction, and that meditation allows us to let go of this fiction. We find with these writings both phenomenological descriptions of meditative experiences and philosophical formulations of their implications for ideas of the self.

Later developments in religious expression, such as the *bhakti* or devotional traditions beginning in the first millennium CE, and Tantra, a complex religio-ritual system beginning also in the first millennium CE, expanded upon the phenomenology of meditation developed earlier. These later movements incorporated an integration of aesthetic elements and, in the case of Tantra, a reformulation of the relationship between the body and altered states of awareness. Both the *bhakti* movements and Tantra present pan-India evolutions of meditation practices. Both these later movements transcend religious and sectarian boundaries.

One other formative distinction ought to be mentioned: the relationship between the use of meditation practices for the goal of shifts in awareness, directed inwardly, and the use of meditation practices for the attainment of a capacity to affect the physical world through non-mechanical interventions, known as *siddhis*, or powers derived from meditation practices. These include powers like the ability to read the minds of others, the ability to levitate, and the capacity to stop the effects of poison on the body. The development of *siddhis* through meditation practices operates as a fundamental selling point influencing the

historical acceptance of meditative praxis within wider social arenas, as Tantric practitioners from across the spectrum of Indian religious traditions used the seemingly magical powers derived from their practices to influence kings and polity. At the end of this chapter, I focus especially on a particular Tantric "easy" practice, the *Pratyabhijñā* or "Recognition" school, which offered an integrative attempt to bring ideas of transcendent divinity into the mundane.

Vedic period

The writings left from the early nomadic inhabitants of India in the middle of the second millennium BCE, termed the Vedic period, mark the beginnings of what we can track linguistically of early Indian practices. The primary religious practice of this period focused on rather elaborate rituals for fire accompanied by oral recitations of hymns and offerings made into the fire. For instance, the *jyotiṣṭoma* sacrifices, a class of seven different sacrifices involving offerings of a sacred plant, the *soma*, could last for one day in the case of the *agniṣṭoma*, or for many days, with as many as 16 priests participating, for the *agniṣṭoma*. The *agniṣṭoma* and the *jyotiṣṭoma* are the names of Vedic rituals using fire as the medium for offerings to the Vedic gods. The sacrifices were made to a variety of gods, most notably Indra, the god of thunder and lightning, and Agni, the god of fire, who served to carry human offerings to the gods in heaven via the smoke of the fire. Frequently fire sacrifices followed a model of shorter rituals embedded in longer rituals, requiring offerings of plant foods, milk, and animal sacrifices. These early Vedic practices set the parameters for subsequent religiosity, which tended toward either aligning with the earlier Vedic traditions, as in the case of Brahmanism and what eventually later became lumped under the rubric of Hinduism, or conversely, against Vedic practices, as in the case of Buddhism and Jainism. Early Vedic practices rely on an implicit polytheism and call on various deities to intervene on behalf of human requests.

Certainly, the early Vedic rites invoked a potent psychology for the practitioner, as for instance where the sacrificer wore a black deer skin symbolizing the placenta to effect a ritual rebirth in the *Aitareya Brahmaṇa* (Haug 1863). However, should we understand the pervasive ritual practice of the Vedic period as a form of meditation? Does meditation require a silence and inwardness that we might suspect to be absent in a ritual space? Is it possible to be outwardly engaged in verbal recitation and making offerings into a blazing flame, invoking the formulas of ritual and at the same time still achieve a state of meditation? Whatever the case—which may ultimately turn upon a semantic understanding; that is, how we go about defining meditation—the hymns of the *Ṛg Veda* do offer us images of what looks something like a transformed

consciousness akin to the results of what we think of as meditation. We see, for instance, the wild-haired *keṣin*, the meditative figure who is called "the light of stars, seen in the heaven, in all space, girdled with the wind, who goes where the gods have gone,"[1]—even if we must wait for Buddhism and the Upaniṣads to extract a notion of meditation divorced from the idea of anthropic deity.

Vedānta

The final section of the Vedic corpus in terms of chronology brings us the Upaniṣads, also called Vedānta, beginning around the eighth century BCE. These texts usher in a novel approach to ritual practice, emphasizing introspection. In brief, they reformulate the relationships between humans and deities via ritual practice, articulating what has come to be considered some of the earliest practices of meditation. We might even say that the Upaniṣads discover meditation proper. The texts of the Upaniṣads have historically been understood as secret teachings. The power of these secret teachings lies in a particular notion, the concept of *bandhu*, the idea that a person contains within him or herself the totality of the cosmos. If one knows the secret inner expression, then one is able to control external phenomena, the wind, fire, as expressions of that internal presence. So, Yajñavalkya tells his interlocutor Gautama in the *Great Forest Secret Text (Bṛhadāraṇyaka Upaniṣad)*:

> that self of yours who is present within but is different from the fire, whom the fire does not know, whose body is the fire, and who controls the fire from within—he is the inner controller, the immortal (Olivelle 1996, *Bṛhadāraṇyaka Upaniṣad* 3.7.5, p. 42).

By meditating on the internal presence, the inner controller (*antaryāmin*), one could sidestep the onerous process of external ritual and achieve simultaneously a similar, if not better, efficacious result without external ritual. Here the idea of knowledge becomes paramount; knowledge becomes a shortcut. The secret teachings of the Upaniṣads propose that the operative principle bringing about the effects of the ritual really derive from an inner knowledge. How does one acquire this knowledge? In a word: meditation. Meditation is the favored technique, if not the sole means.

We might understand this type of meditation on the inner controller as entailing a psychological shift in awareness. Rather than a focus on objects in their externality, the shift in awareness toward an inner subjectivity that resides within and controls from within points to a pervasive, if elusive, sense of subjectivity as

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[1] From GRETIL, Gottingen Register of Electronic Texts in Indian Languages: http://gretil. sub.uni-goettingen.de/gretil/1_sanskr/1_veda/1_sam/1_rv/rv_hn10u.htm. Translation modified from Griffith (1889)–92.

the basis of knowledge. This foundation as a kind of self-knowledge can really only be approached through an inner introspection, through the self-reflection of meditation. I say elusive because it becomes a trope within these texts and the tradition as a whole that the self, known as the *ātman*, which often translates as self,[2] and the inner controller, *antaryāmin*, is the seer that can nevertheless itself not ever be seen. We see for instance Yajñavalkya explaining to his wife Maitreyī the secret of immortality in the self:

> This self, you see, is imperishable; it has an indestructible nature. For when there is a duality of some kind, then the one can see the other, the one can smell the other, the one can taste the other, the one can greet the other, the one can hear the other, the one can think of the other, the one can touch the other, and the one can perceive the other. When, however, the Whole has become one's very self (*ātman*), then who is there for one to see and by what means?. . . Who is there for one to perceive and by what means?
>
> By what means can one perceive him by means of whom one perceives this whole world?
>
> About this self (*ātman*), one can only say "not—, not—" (Olivelle 1996, *Bṛhadāraṇyaka Upaniṣad* 4.5.14–15, p. 71).

This famous apophasis of Yajñavalkya's, where he tells Maitreyī that the self is "not—, not—" (*neti, neti*), becomes one of the signature "great statements" (*mahāvākya*) of Hindu tradition, signaling a presence that can be felt, known—through meditation—but not discursively, objectively pinned down. However one might try to point to the sense of self to contain it within an objective picture, one fails. The self is the driver of the engine of perception, but cannot itself be seen. Here we see especially the idea that meditation offers a window into a psychology of self that cannot be accessed via rational enquiry.

Yajñavalkya also hints at another component of subjectivity that plays a large role in later tradition, namely, a collapse of the subject-object polarity into an essential monism. This insight of Yajñavalkya's, that the immortal, indestructible self sees nothing that is not its own self, becomes a guiding principle for some schools of nondualism that develop in India, most famously *Advaita Vedanta*. For our purposes here, it represents another element of the psychology of meditation; it refocuses attention to subvert our pervasive mental perception of duality. And at the same time that we find that the idea of self cannot be boxed into a definitive object, we also see that discovery of self leads one to recognize its omnipresence. In another early Upaniṣad, the *Chāndogya Upaniṣad*, we see Śvetaketu learning from his father about the nature of the self.

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2 But note that Patrick Olivelle (1996) in his translation provocatively goes against later Hinduism's assertion of *ātman* as transcendental self by on some occasions translating *ātman* as "body."

Here, rather than telling his son not to try to point to it, instead Āruṇi tells him that it pervades throughout. Giving his son an embodied teaching, he says:

> "Put this chunk of salt in a container of water and come back tomorrow." The son did as he was told, and the father said to him: "The hunk of salt you put in the water last evening—bring it here." He groped for it but could not find it, as it had dissolved completely.
>
> "Now, take a sip from this corner," said the father. "How does it taste?" "Salty." "Take a sip from the centre. How does it taste?" "Salty." "Take a sip from that corner. How does it taste?" "Salty." "Throw it out and come back later." He did as he was told and found that the salt was always there. The father told him: "You, of course, did not see it there, son; yet it was always right there. The finest essence here—that constitutes the self of this whole world; that is the truth; that is the self (*ātman*). And that's how you are, Śvetaketu." (Olivelle 1996, *Chāndogya Upaniṣad* 6.13.1–3, p. 154–155)

The self is omnipresent, if seemingly invisible. Here the teaching is passed on from a father to his son. For the tradition that follows, the crucial insights transmitted through these secret texts attest to a shift in understanding of the nature of self. Moreover, this shift does not primarily come about through logic and reasoning, but rather is facilitated by a psychology of self-attention—accessed through meditation. Whether this is an insight that can be reached by training the mind, or whether the training of the mind that meditation involves simply frees it to stumble upon this crucial insight into the nature of self, is debated within the tradition. Yet, the expression of a meditative experience, the realization of oneness in particular, becomes one key litmus test for onlookers to ascertain whether or not a meditating sage has accessed the desired goal of enlightenment. In terms of a psychology of self, this particular strand of the Indian meditation traditions promotes a sense of expanded selfhood, both through a *via negativa* (we can only say what it is not) as a self that cannot be pointed out, as Yajñavalkya tells his wife Maitreyī, and as a self that is a non-obvious substratum of all that we encounter, as Āruṇi tells his son Śvetaketu.[3]

So, these early thinkers articulated a conception of subjectivity that imputed a pervasive, if non-visible, sense of self divorced from an idea of anthropic deity. Self-reflection and meditation became the tools to gain this shift in perspective. Thus, the chronologically latter part of the Vedic corpus, the secret forest texts of the Upaniṣads, emphasize a move away from the elaborate rituals for gods enjoined in the *Vedas* in favor of meditative practices, often re-enacting ritual principles internally for the meditator. This functions on the one hand to relocate the essence and efficacy of external deity to the self within. On the other hand, it steers away from a simple formulation of human as worshipper and god(s) as

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[3] See also Claxton's chapter in this volume, which addresses this idea.

worshipped in a dualistic and fundamentally hierarchic relation. The implication of this for a psychology of meditation is that we discover in these early thinkers a sophisticated use of meditation as a means for reformulating—even, we might say, appropriating—an idea of deity as primarily a subjective experience within a psychology of self.

We might also understand this early venture into meditation as a psychological practice that enables a transcendental self to emerge as foundation in contrast to the multiplicity we see here in the world. This becomes a *sine qua non* of much classical Indian exploration of meditation and a primary focus of debate, especially with the Buddhist doctrine of *anātman*, "no-self," seeking to unravel this foundational postulation of self. The notion of self, *ātman*, operates as a psychology of subjectivity writ large through the sustained reflection of self in meditation.

Jainism

Another strand of Indian meditation practice that begins to take form not so long after the Upaniṣads can be found in Jainism. As a religious tradition, Jainism boasts an extensive literary history and a heightened attention to asceticism. Jain doctrine, like Buddhism, rejects the extensive sacrificial ritual of Vedism, in this case especially because Jainism's central tenet of nonviolence (*ahiṃsā*) opposes the harm toward other life required in ritual sacrifice. This rejection of harm is taken to its logical conclusion in the Jain adoption of extreme austerity in food practices. One could argue that the quintessential Jain practice is asceticism, fasting in particular, yet this asceticism is usually coupled with meditation practices. Meditation (*dhyāna, sāmāyika*) is considered one of the six internal austerities that a Jain undergoes; practices around limiting food constitute several of the external austerities. One of the most important figures for Jainism, the twenty-fourth and last great sage, the *tīrthaṅkara* ("bridge-maker") Mahāvīra, who lived in approximately the sixth century BCE, practiced meditation in conjunction with austerities for 13 years in order to reach the goal of Jain practice, *kaivalya*, a supreme state of "aloneness." Sitting in a squatting position, fully exposed to sun and weather, he persisted in meditation, concentrating the mind (*ekāgramanaḥsanniveśana*) until he reached his goal. Jain meditation seeks as its hopeful result of this practice the lessening of the dross of karma, which holds the soul and the body down.

Not monist, like the *Advaita Vedanta* interpretation of the Upaniṣads, Jainism nevertheless, like Brahmanism and other forms of Hinduism, hangs on to an idea of soul or self. In the case of Jainism, all beings have separate souls and each has a very material form, as does the negative karma that sullies it and weighs it

down. For Jainism doctrinally, the current world age is too dark a period for any person living now to achieve the final goal, *kaivalya*, or "aloneness." However, the twenty-fourth and last great sage, the *tīrthaṅkara* Mahāvīra, who achieved this state in the sixth century BCE, also acquired (for one strand of Jainism) a diamond body, impervious to suffering and hunger, as a result of his practice of asceticism and meditation. Jainism certainly stresses meditation as a practice historically, even if asceticism takes pride of place. Jain meditation is less concerned with watching the breath or concentrating on it, which is a key component of Upaniṣadic speculation on ideas of self and which becomes an important fulcrum for later yoga practices, such as we see in forms of Buddhism and in elements of Patañjali's *Yoga Sūtras*. Meditation for Jainism does in some cases involve some visualization, such as in a classic Jain meditation, the *piṇḍasthā dhyāna*, which focuses on the elements of earth, fire, water, and air, situated in a cosmic ocean. Jain meditation, often a 48-minute period in the morning, aims to "isolate the mind from all earthly desires and suffering and to put it in a state of quietude" (Glasenapp 1999). Jainism, like Brahmanism and varied forms of later Hinduism, as well as Buddhism, relies on repeated recitation of scriptural texts in addition to study of the tradition.

With regard to notions of subjectivity, ideas of the body and materiality are deeply wrapped up in Jain conceptions of selfhood, even as Jainism offers a picture of subjectivity that seeks to leave behind the materiality of the body, or at least to use a combination of meditation and asceticism to free the physical body from weakness. Hearkening to its early Sāṃkhya philosophical roots, Jain efforts in meditation strive toward an extrication of subjectivity out of materiality, with a dualist conception of self in opposition to the materiality of the body. So, for instance, entrance into the fourteenth stage of meditation brings about *vyuparatakriyā nivṛtti*, a state of "cessation of even the slightest amount of activity." The ideal of a complete cessation of physical activity signals the separation of self from matter, with the notion of activity historically connected with the body. So, this advanced stage of meditation points to a psychology of extrication of the subject; its isolation from the change and decay necessarily entailed in all matter. The meditation goal of Jainism, *kaivalya*, or "aloneness," is thus an articulation of a transcendent self, isolated from interaction with others. This is graphically represented in the Digambara Jain image of Mahāvīra, with his impenetrable, diamond-hard body, not eating, that is, not taking anything in, not speaking, as his body simply emits a vibrational hum that is translated for his followers by his close attendants. The enlightened sage presents a self that is above and closed off to interaction with worldly intercourse. It may thus be helpful here to point out that we see again a reiteration of the theme that meditation practices lead to a discovery of notions of a transcendent self; that part of

the impetus behind a meditation praxis is precisely access to a transcendent self. We should also remember that Jain meditative and ascetic practices are fundamentally intertwined, in an asymptotic effort, at least for our current age, to rise above the limitations of embodiment, precisely as an expression of a transcendent self.

Buddhism

Buddhism aligns with Jainism as both are early traditions that reject the authority of the *Vedas* as scripture and reject Vedic sacrificial practices.[4] Still, in contrast to Jainism, Buddhism proposes a path rejecting the extreme austerities enjoined in Jainism. The tradition links the Buddhist rejection of asceticism to the well-known story of the Buddha's attempts to reach enlightenment through fasting, which becomes a favored subject of Buddhist iconographic statuary centuries later. Frustrated with the lack of progress from fasting, the Buddha rejects austerities in favor of the "middle way," which becomes the signature descriptor of Buddhist practice. The "middle way" emphasizes the Buddha's discovery that meditation itself—not the austerities of Jainism's sleep deprivation, fasting, and bodily mortifications—leads one to awakening and enlightenment. Indeed, from the Abhidharma texts of the early tradition through the Mahāyāna and the Tantric practices of Tibet, Buddhism presents an extraordinary complexity of praxis centered especially around the core experience of meditation.

If Jainism promises a path of meditation and austerity that will lead to an extrication of subjectivity out of the messy world of matter, Buddhism, in contrast, reformulates the problem. Rather than using meditation to discover a transcendent subjectivity that can rise above material concerns, Buddhism calls into question the motives for postulating a transcendent self in the first place. In a profound psychological insight, the Buddha's famous "no-self" doctrine (*anātman, anattā*) asserts that any notion of a self is driven by our *desire* to posit a stable sense of self persisting through time. This desire presents as human mental clinging to a notion that has no basis in phenomenological experience. Meditation as a practice allows one to gain insight into the fundamentally "empty" (*śūnyatā*) character of all postulation of a self. That is, all phenomena arise interdependently; there is no foundational self that exists as a permanent refuge from suffering and impermanence. In specific practice, the aspirant uses

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4   This typology, which classes together traditions rejecting the authority of the Vedas, is recognized early in the exegetical literature, with those rejecting Vedic authority called "nāstikas," literally, the "the ones who advocate there is not."

the fundamental insights of the Buddha, the Four Noble Truths of universal suffering and impermanence, as a referential frame for transforming our psychologically driven and incorrect conceptions of self through meditation on these truths.

Lest one worry that positing an idea of "emptiness" as the interdependence of all phenomena might lead to a slippery ungrounded ontology that lacks a capacity to underwrite a behavioral ethics, the tradition uses the Buddha's initial insights themselves as foundation. These insights that disclose the essential impermanence of all phenomena do not open up to a wholesale relativism in this case. The Four Noble Truths themselves anchor the process of meditation.[5] With this, meditation on the Four Noble Truths reveals the contingent nature of what appears—erroneously—so blatantly self-obvious: the postulation of a self. The practitioner seeking to realize in him or herself the Four Noble Truths in the Mahāyāna tradition,[6] cultivates deep concentration (*samādhi*) on these truths by contemplating them with attention (*sādara*), without interruption (*nairantarya*) over an extended length of time (*dīrghakāla*) (Woo 2009). This results in a three-step process including first intensification, then termination, and then the final result of direct meditative vision (*yogipratyakṣa*) into these truths (Woo 2009). The process involves both a constructive activity, the contemplation of aspects of the Four Noble Truths, and a deconstructive component, a loosening and rejection of the layers of unwarranted mental postulations of an abiding self and its persistence through time.

The psychology employed in this meditative exercise certainly employs a cognitive element, both in the constructive contemplation of Buddhist truths and in the agile contemplative efforts to free the mind from the cultural overwriting (*vikalpa*) that traps one into believing in incorrect ideas that ultimately lead to suffering. It would be too much to try to outline here the transformations that the Buddha's "no-self" doctrine undergoes as the tradition grapples with numerous ideas—explanations of reincarnation, how to reconcile a doctrine of momentariness with the experience of memory, ideas of an essence-like Buddha-nature that eventually takes a prominent position in later Buddhist exegesis. In terms of a psychology, the Buddhist exploration of meditation, from its early formulations in Abhidharma that put forth different practices for different psychological types (*upāya*) (one person might be instructed to meditate in a small cave, while another might be instructed to meditate under the

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[5] As Jeson Woo notes regarding the Four Noble Truths, "[s]uch aspects are considered true since they are subject to neither destruction nor alteration over time" (Woo 2009).

[6] Following the seventh century CE Indian Buddhist scholar Dharmakīrti in this case.

open sky), to Tibetan practices of visualizing oneself as deity—all through, Buddhist praxis underwrites a keen appreciation of human psychology. As a tradition that locates meditation praxis as part of its founding mythos in the story of the Buddha's enlightenment, Buddhism takes quite seriously the phenomenology of a psychological self that becomes a primary object of self-reflection; the practice of meditation unfolds and helps to formulate this psychology of subjectivity, even as it discounts the notion of permanent self (*ātman*).

Advaita Vedānta, later Hinduism

We can also see the impact of Buddhist ideas of the "no-self" doctrine on later forms of Hinduism. The eighth century philosopher Śaṅkara borrows extensively from Buddhist rejections of self as he synthesizes from earlier sources a particularly prominent school of Indian philosophy, *Advaita Vedānta*, still popular today. Through his commentaries on the Upaniṣads, he espouses an idea of subjectivity as a cosmic and depersonalized self-awareness, proposing a notion of self as transcendent subjectivity, a bare, stripped-down subjectivity, *satcidānanda*, "being, consciousness and bliss." Śaṅkara's phenomenology of a self as a pure subjectivity, abstracted out from the material trappings of personality, was by no means universally accepted, as he was accused by later Hindu commentators of being a crypto-Buddhist (*pracchanna bauddha*) (Isayeva 1992). The decoupling of self from notions of personality was, no doubt, formulated at least in part in response to Buddhist doctrinal articulations of "no-self."

Particularly influential was the Vijñānavāda, the Buddhist school dubbed "mind-only," that is, the idea that all reality is internal to the mind. These later understandings of a universal, abstract self, the *ātman* of *Advaita Vedanta*, assert the necessity for a concept of self, even as they refine the idea of self away from any particular or personal formulation of self. Moreover, the schools of Hinduism that offer a universal and abstract conception of self tend also to emphasize meditation as key in the process of enlightenment. One sees with this also the notion that the awareness of a transcendent self presents as a discovery arising out of meditation practice. Here we see a process similar to what we find in Buddhism, which offers a constructive component as a basic truth, which the aspirant then also discovers *through* meditation. In tandem with this is also a deconstructive mental component of meditation where, as with Buddhism, meditation practice affords insight also through filtering away the obscuring mental conceptualizations (*vikalpa*).

So philosophical conceptions of self and subjectivity influence how meditation, and especially the goal of meditation, is framed within particular

traditions in India. India offers a rich history of philosophical perspectives on the idea of selfhood, which is expressed in the writings of different philosophical schools, such as Nyāya, the school of logic, and Sāṃkhya, an early philosophical school that offered a basic cosmology of matter and spirit as bifurcated. Indeed, a great deal of philosophical discourse hovers around conceptions of self (*ātman*) or its rejection, and its relationship to the world and to divinity, which, one might argue, derives from the parameters set by the Buddhist doctrine of "no-self." Also, much subsequent debate focuses on epistemology, which, at least in part, grounds itself on the correspondence of meditation insights with canonical texts. At a minimum, the phenomenology of self that one encounters in the process of meditative self-reflection is shaped by and shapes philosophical conceptions of self.

We can see in this discussion a plethora of different perspectives on what it is precisely that one discovers in the process of meditation. The ontological framework varies, yet oddly, the practices employed across these traditions are generally quite similar (with perhaps the exception of a greater intensity of asceticism found in Jainism). Generally, we find techniques involving visualizations, both of self and external figures, such as deities, recitation of canonical texts, recitation of short formulas called mantras, techniques associated with awareness of self and body as persistent practices, including in this last category *vipassana*, or insight, and *śamatā*, calming practices that have made their way from Buddhism to the West. In addition, Hindu particularly but also some forms of Buddhist and Jain traditions incorporate ritual as a component of meditation practices. These rituals frequently present as rituals of hospitality (*pūjā*), making offerings such as food, incense, water, and so on. We also see some use of fire rituals (*homam*), particularly in Hindu traditions.

Bhakti

Bhakti, or devotion, also begins to play a large role in the Indian subcontinent in the early medieval period and devotional meditation practices are absorbed within nearly all religious traditions in India as an adjunct to meditation practices proper. These devotional practices entail cultivation of love for a deity or religious figure as a method for enhancing practice. Certainly, practices of devotion and love incorporate a potent psychology in relation to goals of spiritual transformation. In terms of method, expressions of devotion often utilize devotional singing and ritual offerings (*pūjā*). Moreover, we see devotional practices across the board, in Buddhism, Jainism, and Hinduism. Even where we find purist expressions of meditation, for instance in the twentieth-century figure of Ramana Maharshi, who represents perhaps one of the strictest

examples of an enlightened figure practicing and advocating meditation, still we find the incorporation of *bhakti*, devotion. Ramana Maharshi also composed poems of devotion to Arunachala, the deity of the mountain where he lived as a form of the god Śiva. He spent years in silent meditation and advocated a path of self-enquiry, posing the question, "Who am I?" and following the awareness of the "I" back to its source. Ramana Maharshi is classed as a "*jñānī*," that is, someone who follows the path of knowledge, as opposed to paths of devotion or ritual performance. He was not trained in classical Indian philosophy, though one might imagine that living in South India, even in the early twentieth century, he was exposed to general philosophical conceptions, especially the quite popular nondual *Advaita Vedanta* that his teaching resembles.

For our purposes here, we might note two points. First, Ramana Maharshi's teaching of meditation centers on a self-reflection that explores the phenomenology of subjectivity; the guiding, repeated focus of attention is "Who am I?" It is probably important to point out that again we see meditation as coupled with working out ideas of selfhood and subjectivity. Secondly, he also eventually incorporates a devotional component to his practice. Even though he is considered by no one to be an example of *bhakti*, devotion—even this exemplary icon of meditation also incorporates a component of devotion. This leads to another consideration; might it make sense to posit that the relationality of *bhakti*, devotion, which necessarily entails a sense of the "other," helps to balance the emphasis on self that arises in meditation's necessary self-focus? We might even go so far as to say that a psychology of meditation requires these two balancing elements. The self-reflection and exploration of the phenomenology of the self that meditation frequently engenders needs its counterpart in the relationality to an "other" that *bhakti* adds to the mix. As a side-note, we may observe that as Indian meditation practices become imported more and more into contemporary Western settings, the subtraction of devotion as not relevant to our contemporary Western context may be missing something crucial in the dynamics of meditation. Perhaps as a response to this lack, we do see an increasing number of meditation practices offered to Westerners with an emphasis on generating compassion, such as those of Kristin Neff, John Makransky, and Paul Gilbert, for instance.

Yoga

Like *bhakti*, it is probably fair to say that yoga practice has historically been connected with most, though perhaps not all, philosophical schools and religious traditions in India. Also, as we see with early Buddhist texts, yoga offers a

psychology of meditation par excellence. In its earliest textually available forms, the school of yoga is first and foremost a path of meditation. Patañjali's *Yoga Sūtra*, a text dating to roughly the fifth century CE, offers one of the early formulations of the path of yoga and most contemporary readers are surprised to find that the text spends most of its time describing techniques for engaging the mind in meditation, not outlining the various physical postures we associate with yoga classes today in the West. In fact, Patañjali devotes only three lines to yoga postures, telling us that for the practice of yoga, the posture, *āsana*, should be just easy (*sukha*) and steady (*sthira*).[7] The commentary on the verses, the *Yoga Sūtra Bhāṣya*, adds the specificity of traditional postures, pointing to several well-known postures, including the lotus posture (*padmāsana*).[8]

The *Yoga Sūtra* functions in general as a kind of nuts and bolts handbook for dealing with the mind in meditation, as the text describes step-by-step processes involved in disciplining the mind for the practice of meditation. Presenting a sophisticated psychology, we see on the one hand how the *Yoga Sūtra* offers descriptions of how the mind works and how thought works. There are five modalities of mental activity, including valid judgment, error, conceptualization, sleep, and memory (Āgāśe 1904, 1.6). On the other hand, the *Yoga Sūtra* also gives prescriptive teachings, for instance, instructing the reader on how to prevent distractions from meditation by focusing on a single principle (Āgāśe 1904, 1.32), or how one can make the mind tranquil by a measured exhalation and retention of the breath (Āgāśe 1904, 1.34), or by cultivating positive thoughts in order to counter the influence of a mind racing with negative thoughts (Āgāśe 1904, 2.33). Even as the *Yoga Sūtra* offers a variety of psychological techniques for working with the mind, its primary understanding of yoga is defined by stopping the flow of thoughts (Āgāśe 1904, 1.2: cittavṛtti nirodhaḥ). The techniques and practices for meditation that yoga outlines are similar to what we see in Buddhism. Both of these, and Jainism as well, include preliminary steps involving avoiding negative behaviors like stealing, lying, and violence, along with cultivating positive qualities like cleanliness and contentment.

The *Yoga Sūtra* also discusses what look like magical powers that result from the practice of yoga. By meditation on specific places in the body, one acquires

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[7] Patañjali *Yoga Sūtra*, 2.46. in Patañjali: Yogasutra with Bhasya (= Pātañjalayogaśāstra), *Pātañjalayogasūtrāṇi (Vācaspatimiśraviracitaṭikā, saṃvalitaVyāsabhāṣyasametāni . . . tathā BhojadevaviracitaRājamārtaṇḍābhidhanavṛttisametāni.* Edited by Kāśinātha Śāstrī Āgāśe, Anandasrama Sanskrit Series, no. 47, 1904.

[8] Traditionally understood to be authored by Vyāsa, the same fabled prolific author of the epic *Mahābhārata*; however, it may be that the *Bhāṣya* commentary is an auto-commentary, as Philipp Maas argues, by the great sage of yoga, Patañjali himself (Maas 2006).

different abilities. For instance, meditation, the text tells us, "on the throat affords control over hunger and thirst" (Āgāśe 1904, 3.30: kaṇṭhakūpe kṣutpipāsānivṛttiḥ). Similarly, meditation on the vital breath rising in the body affords the ability to walk on water (Āgāśe 1904, 3.39), a feat we see popularized across continents in the Gospels of Mark and Matthew in Christianity. The *Yoga Sūtra* ultimately discounts these magical powers as a distraction from the real goal of meditation (Āgāśe 1904, 3.37 and 3.50). Following the cosmology of Sāṃkhya with its dualistic separation of matter and spirit, with which the school of yoga is classically connected, the *Yoga Sūtra*'s philosophical legacy from Sāṃkhya tends to undercut the importance of powers over matter and the body. So, despite likely teasing curious readers with an entire chapter devoted to the powers attainable by yoga, or perhaps precisely to let would-be practitioners in on the worldly practical, if not spiritually desirable, benefits of yoga, the *Yoga Sūtra* ultimately discards the powers it promises.

Rather, yoga proposes using meditation to attain a freedom of spirit detached from material constraints. Indeed, the ultimate, desired state resulting from meditation in yoga is signified by the term "*kaivalya*," the "aloneness" we saw earlier in Jainism, which was also deeply influenced by the dualistic cosmology of Sāṃkhya. Thus, the concluding verse of the *Yoga Sūtra* tells us: "final aloneness occurs when the evolutionary flowing forth of nature's qualities is curbed, as they lack purpose for the spirit. With this the energy of consciousness rests in its own true nature" (Āgāśe 1904, 4.34: puruṣārthaśūnyānāṃ guṇānāṃ pratiprasavaḥ kaivalyam svarūpapratiṣṭhā vā citiśaktir iti). Apart from the apparent irony in that the path of yoga, literally "union," leads to "aloneness," we see again that classical meditation focuses fundamentally on a phenomenology of subjectivity, of the self. A person commits to the hours of self-reflection that yoga advises in order to ascertain "one's own true nature" (*svarūpa*) as separate from the messy psychology of mind, body, and materiality entangled within conceptions of self. So, again, we see that meditation fundamentally invokes an examination of the nature of the self and that this subjectivity is thickly intertwined with a psychology. Moreover, a primary impetus of yoga techniques focuses on isolating the sense of subjectivity from components of self that connect to mind or body.

Tantra

Tantra presents a watershed moment in one key regard: It pushes back against the pervasive tendency that opposes the self to the materiality of body and world. Like yoga and *bhakti*, Tantric practices also find their way into much of Indian philosophy and meditation, including the varied forms of Hinduism,

Buddhism, and even, if only to a small degree, Jainism as well. Indeed, the influence of Tantra on later forms of Buddhism, Tibetan Tantric Buddhism, for instance, leaves in its wake a Buddhism almost unrecognizable by the criteria of early forms of Buddhism connected with the Pali tradition. Medieval expressions of Tantra, of course, vary from religion to religion and sect to sect. However, we see a point of convergence across various traditions in the inner logic of Tantra's resistance to the abstracted, transcendent self set against ideas of body and matter. We find an incorporation of the body within Tantric meditation practices and philosophy, for instance encoded in the *yabyum* of Tibetan Buddhism, and in the elevation of goddesses in Bengali Tantra (and elsewhere). We see it again in the incorporation of a plethora of physical postures in the *haṭha* yoga so popular today as a Tantric infusion into yoga, in the idea of the serpent power of *kuṇḍalinī* as a bodily experience leading to enlightenment. We also see it in the use of the body as receptacle when a meditator ritually inserts various deities in his or her arms and torso in the practice of *nyāsa*, "installing deity." For this final section, I want to focus on one particular ancillary element of the Tantric incorporation of matter into its conception of self: its use of wonder.

For this I draw from the tradition called *Pratyabhijñā*, or "Recognition" school, a subset of ninth- to eleventh-century Kashmiri nondual Śaiva Tantra, which offered a philosophically sophisticated articulation of Tantra's incorporation of materiality into its conception of the absolute. I am choosing this concept of wonder because I feel it reflects in some measure the personal experience I describe in the Personal Meditation Journey. Also, I suspect that the experience of wonder may be accessible to a contemporary Western sensibility in a way that most ritual practices taken from India are not. Moreover, it offers a not-so-well-known component of Indian meditation practices, which serves as counterpart to the already widely popular promulgation of practices of mindfulness.

Nondual Kashmiri Śaiva Tantra presents a philosophical high point for Indian thought, generating an efflorescence of literary and ritual culture that migrated throughout most of India in the succeeding centuries. This was masterfully articulated by ninth- to eleventh-century Kashmiri thinkers, including particularly Abhinavagupta, his teacher's teacher, Utpaladeva, and his disciple, Kṣemarāja, among others. The philosophy that comes out of this period offered a profound challenge to Buddhist and *Advaita Vedantin* formulations of mind and the world. Particularly we might point to the *Pratyabhijñā*, a panentheistic doctrine that suggests that the highest absolute reality is one we can always instantly access, simply by "recognizing" its immanent presence in our own selves, in all of our material surroundings.

The novel signature component of this nondual Kashmiri Tantra is an asser-
tion of an always already inherent consciousness within matter. This has the
added effect of affording a new reverence for the body and the material world.
They are not separate from our own sentient self-comprehension. This philoso-
phy also lends itself to a reconceptualization of the very nature of the divine, by
inserting a dynamism into it. Thus, consciousness, which is the nature of the
absolute, is not static or transcendent. Rather, it unfolds itself through its evolu-
tionary articulation as matter, in this case as divine *Māyā*, with a double move-
ment of veiling over the innate consciousness of everything here and unfolding
into the multiplicity (*vicitra*) of the world.

We can see right away the profound psychological implications that the idea of
an evolving consciousness has for a practice of meditation. To begin with, con-
necting the absolute state to the idea of consciousness (*cit*) makes it in some sense
accessible to awareness, linking it to mind and psychology, something we see also
in earlier forms of Buddhism and *Vedanta*, for instance. In this case, attaining a
transcendent, unchanging state above the ever-changing flow of mind and the
unstoppable decay of matter is a long-standing and traditional goal of many
Indian meditation practices—for this perspective, however, it is no longer an
ideal. Instead, we encounter an embrace of the flow and change within subjectiv-
ity as an inherent power that consciousness possesses. This is the power of *Māyā*,
no longer in this Kashmiri Tantra tradition demonized as a beguiler. Instead
Māyā represents an essential creativity of consciousness. This energy of *Māyā* is
what generates an initial sense of subject and object. The *Pratyabhijñā* allows one
to recognize the game of hide and seek that the self plays with itself. This also
hints toward a revisioning of selfhood that leaves space for an evolutionary com-
ponent, an element that offers a resonance with our own current world concep-
tions of a changing human psyche. At the same time, this dynamism also leaves
space for the expression of magical powers, *siddhis*, which likely is one of the
reasons that Tantra became so popular, especially with rulers.[9] Along with this,
Tantric practices across the board do not simply promise enlightenment or lib-
eration; rather, Tantra explicitly promises both, in a pithy memorable rhyme,
"*bhukti-mukti*," worldly enjoyment with power *and* liberation.

In any case, the incorporation of dynamism and change into the idea of the
absolute substratum is something that earlier traditions, like *Advaita Vedanta*,
for instance, take pains to avoid. They do this precisely in order to maintain a
pristine sense of transcendent self, unblemished by the change and imperman-
ence that functioned as the source of suffering for the ancient world. We should

9   Alexis Sanderson has discussed this in his masterful historical surveys of Tantra. See espe-
     cially Sanderson (1988).

keep in mind that "impermanence" might be read as a code word for the idea of inevitable death of all things that time reveals. It will take us too far afield here to pursue the incorporation of time into ideas of divinity;[10] however, we may note that this bold step is akin to philosophically taking the tiger by the tail. Rather than refining ideas of selfhood away from change and the body, instead embracing these elements shifts the formulation of selfhood in just as dramatic a way as did the Buddha's early rejection of an idea of self altogether. For one, it answers the dilemma of impermanence, which, indeed, may have been one of the primary drivers for an idea of a transcendent abstracted sense of selfhood in the first place. The answer this Tantric shift gives, to embrace the body with all its impermanence, does not render the question null and void as does the Buddha's early rejection of self; however, it does propose an astute psychological understanding of the underlying psychological motivation that leads to an abstracted and transcendent sense of self.

Wonder

The answer this nondual Kashmiri Śaiva Tantra gives is essentially panentheistic, so it does not discard the idea of transcendent self, but rather rewrites it. For this, the idea of wonder acts as a bridge between the numinosity of transcendence and the mundane materiality here. Wonder serves to act as a bridge between a transcendent sense of self and an embodied materiality. What, then, is wonder? Wonder calls forth awe and a transcendence of our mundane mental processes. For a Western context, wonder references two poles. On the one hand, an opening, the beginnings of philosophy, as for Plato and Socrates (Rubenstein 2008). On the other hand it also points for Aristotle to a degenerate sense of curiosity, a puzzle that must be solved and hence must ultimately spell its own demise (Bynum 1997). I focus here on the Sanskrit term *camatkāra*, which does not have the dual meaning inherited from the Greek genealogy. Here, Plato's idea of wonder resonates more closely to the term *camatkāra; camatkāra* does not evoke the sense of curiosity, but rather a kind of suspension of ordinary mental engagement. So, for our context, we may leave aside Aristotle's conception of wonder in favor of Plato's.

It may be fair to say that for both us today and for our medieval Kashmiris, wonder is, above all, a bodily experience, even if the experience of wonder often feels as though it is taking us out of our bodies. Wonder causes our ordinary mental rambling (*vikalpa*) to stop. The awe of wonder connects us to a kind of rapture that seems at least in part other-worldly. For these Kashmiri authors,

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[10] I discuss this at greater length in Biernacki (2013).

the other-worldly feeling of wonder is not so much that it belongs to another world, but rather that it reminds us of an innate subjectivity that transcends our habitual subject-object distinctions. Wonder arises when one accesses the sense of self in its fullness. That is, wonder expands the sense of self beyond its ordinary limitations to connect it to the world in a juxtaposition that stops the ordinary operation of the mind. In his "Fifteen Verses on Awakening" Abhinavagupta tells us:

> Knowledge of the principle of pure consciousness that manifests as one's own freedom—this is the highest state, which cannot be surpassed. It arises when wonder (*camatkāra*) blossoms through the feeling of the complete fullness of the "I" as the whole universe (*viśva*). That, in fact, is liberation, enlightenment (*mokṣa*).[11]

This medieval Kashmiri, deeply schooled in meditation practices, proffers a psychological coding of wonder. Wonder is the link between the sense of self as subject and the multiplicity of the world. Wonder is certainly a state of mind, in this case a psychological awareness that transcends the human propensity toward mental classification of the world. The mind seems to stop, but it is not that the mind ceases, nor that objects merge into the self, but rather wonder suspends the mind's capacity to dichotomize. In the experience of wonder, the two poles, world and self, mapped to object and subject, form a dizzy unity that does not collapse either pole. So wonder breaks our habitual pattern of dichotomous thinking with self in opposition to the world. In this capacity, it also works against a conception of self as transcendent and abstracted.

Indeed, the highest awareness for this Tantric philosophy understands the self as wrapped in the fullness of the world. We see this spelled out explicitly in the commentary that Kṣemarāja, Abhinavagupta's disciple, gives for the *Vijñāna Bhairava*. He tells us that one's true nature, which is Bhairava, "consists of the wonder of the fullness of the world, which contains the whole, in a nondual apprehension with nothing left out."[12] Here again we see the idea of wonder coupled with the apprehension of the world. Wonder works its magic precisely through not collapsing the self and world into a unity, precisely by not allowing the flight of the self up and out, away from the messy plurality of the world, isolated into a perfect and impenetrable solitude of self.

The root text here that Kṣemarāja comments upon in the eleventh century is the *Vijñāna Bhairava*, a key scriptural text for this Tantric tradition, likely

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[11] "yadanuttarasaṃvittattvasya   parijñānaṃ   viśvaparipūrṇahaṃbhāvacamatkārollāsena svasvātantryābhivyaktiḥ sa eva mokṣaḥ" (Jagaddhar 1947).

[12] "bharito'śeṣaviśvābhedacamatkāramaya ākāraḥ svarūpaṃ" (Anonymous 1918, p.12, line 268)

composed in the seventh or early eighth century CE. The author of the *Vijñāna Bhairava* is unknown and the text is considered scriptural revelation. The text outlines a series of 112 different techniques for tapping into this space of wonder, nearly all of them in relation to some sense of the external world. These include techniques like savoring and meditating on the joy that arises from the pleasure of eating and drinking, which brings about a divine bliss (Anonymous 1918, verse 72, p. 60–61). Another holds that if the practitioner imagines that the entire world is being burnt by the fire of the destruction of time and does not allow his or her mind to think of anything else, then such a person attains the highest state of humans (Anonymous 1918, verse 53, pp. 44–45). A third technique involves meditating on one's state at the beginning or end of a sneeze, or in a state of terror, or sorrow, or in flight from a battlefield, or in a state of keen curiosity, or when very hungry or just feeling sated from food, then a person attains a divine meditative awareness (Anonymous 1918, verse 118, p. 102). The *Vijñāna Bhairava* itself does not develop this theology of wonder; it takes the later exegesis of the tradition's scholar-mystics, like Abhinavagupta, Utpaladeva, and Kṣemarāja, to spell out the logic of wonder as numinous container of self and world in a rapture of awareness that leaves behind the mind's tendency to dichotomize into self and others.

To wrap up this discussion I will offer one other quote from Kṣemarāja's commentary on this text, which takes us back to the epigraph from Keats at the beginning of this chapter. This also speaks to a pressing question—how might one cultivate wonder as a meditative practice? The *Vijñāna Bhairava* gestures in various places to adopting an introspective awareness while in the middle of engagement with the world. We also see in the *Vijñāna Bhairava* the power of aesthetic appreciation to generate wonder. Commenting on verse 73, which instructs the yogī to meditate on a beautiful song, to be absorbed in it, Kṣemarāja tells us that:

> . . . through the function of the sense of hearing, one grasps the words of a song with the wonder generated in that. In this way, by seeing this exceedingly beautiful form, wonder arises. From that, one tastes and relishes (*carvaṇa*, literally chewing) the sap of that sweetness and so on.[13]

Poetry and song, wrapped in a sensuous encounter that readily transcends the mental capacity to dichotomize, are especially potent in generating a sense of wonder. Beauty has a power to shift us out of our normal sense of subject and object. By bringing to bear an aesthetic concentration, a kind of metaphorical

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[13] Anonymous (1918), verse 73, p. 62: śravaṇendriyavṛttyā gītaśabdagrahaṇaṁ taccamatkāraṇam, evam atisundararūpavaddarśanacamatkāraḥ, tathā madhurādirasacarvaṇisvādaḥ).

immersion in the sap of beauty, we tap into wonder, a wonder that intrinsically arises out of the materiality of the world.

In this sense, Keats' reflection on melancholy points to a similar transformation of self that occurs even in dark moments of introspection. Joy has as its core a melancholy that overwhelms and transforms the soul. "None save him whose strenuous tongue / Can burst Joy's grape against his palate fine . . ." In this context our Kashmiri mystics tell us something similar: At the core of sensuous experience we find a portal into wonder, a wonder that transforms the self beyond its ordinary sense of limitation into a sense of the fullness of the "I" (*pūrṇāhaṃbhāva*). The wonder that the aesthetic experience enables expresses itself as a melting and expansion of the heart. Abhinavagupta tells us:

> When the *rasa* or flavor comes into one's purview, then it is enjoyed. This enjoyment is differentiated from what is encountered through memory or direct experience. It is characterized by melting, expansion and opening [of the heart].[14]

The aesthetic experience, then, is especially productive of wonder; it is an enjoyment unlike ordinary experience, unlike memory or experience, *anubhāva*, in general. It involves a melting and an opening of the heart and it is comparable to the state of the highest bliss, the supreme Brahman. In this context, we reach a conception of selfhood that does not isolate itself in a transcendent abstraction beyond the world, but rather one that embraces the world.

Personal Meditation Journey

This relates to an early experience I had at the very beginning of my decades-long journey into meditation. I was in my last year at college at the end of the semester, unconsciously struggling, no doubt, with anxiety about my future and displacing this anxiety into a host of other distant and tragic disaster scenarios as unwelcome futures for planet Earth and its inhabitants. I remember this part of my life and recognize in it the fascination of others today, some friends, some not, online-trollers following with a rabid and frozen compulsion the latest unfolding of Ebola, the spread of Fukushima radiation to the California coast, zombie apocalypse movies, my conspiracy-theorist friends' worries of GMO's taking over our food supply, chemtrails, our water fracked away, and an impending global climate change looming ominously, desperately grappling in the midst of this with the darkness of human nature . . . And projecting this anxiety onto the vast and distant reaches of the globe with a grandiosity and drama that

[14] Abhinavagupta, *DhvanyālokaLocana* 2.4; p. 83.

only a young adult in his or her early twenties can pull off. So, beset with a deep sense of suffering in the world, I looked inward (it's hard not to think of that A. E. Housman poem, "When I Was One-and-Twenty", and makes one wonder, are we all inherently Buddhists in our early twenties?). At the time I was also reading a great deal of romantic poetry, Keats, Shelly, and Wordsworth, as well as the metaphysical poetry of Donne, Herbert, and Marvell. Certainly the mood of these poetic strands and certainly the combination of the memento-moribund metaphysicals with the emotionally high-flying romantics fueled an emotional tempest as I turned 21. Feeling a sense of despondency, I decided that if depression was emotional ground zero, then, in stoic fashion I would acclimate myself to this baseline and not swerve from depression. I memorized Keats' "Ode on Melancholy," reciting it over and over many times every day, determined to stay steadfast at least with an emotional low. So, I lived on canned tuna fish and carrots, easy food to keep for a stretch of time and cheap to boot, not leaving my room for weeks, and living the kind of resolve that only a 21-year-old can accomplish with a straight face, I embraced my depression. After about three weeks, though, something odd happened. Partly perhaps from the sonorousness of Keats dancing around my brain, and partly perhaps from the necessary stillness needed to maintain a mood of sadness, one morning I oddly woke up happy, ebullient, and, try as I might, unable to shift into despondency over my plight and the world's. From this I understood a sort of reverse of Keats' notion of melancholy at the heart of the essence of joy; rather joy, as the inner throb, the life at the heart of everything, even sadness. Some years later I came upon this idea in the writings of Utpaladeva and Abhinavagupta, the idea of *cidānandaghana*, a "dense mass of consciousness entangled with joy," as the underlying substratum of experience. In any case, the indelible etching of joy as the soul of even depression set me on a new course.

References

Āgāśe, K. S. (1904). Patañjali *Yoga Sūtra*. Puṇe: Ānandāśrama (Ānandāśrama Sanskrit Series, 47). Input into GRETIL, Gottingen Register of Electronic Texts in Indian Languages, by Philipp Maas.

Anonymous (1918). *Vijñānabhairava with commentary by Kṣemaraja and Śivopādhyāya*. Kashmir Series of Texts and Studies, Volume 8. Bombay: Research Department of Jammu and Kashmir State. Downloaded from Muktabodha Indological Research Institute, www.muktabodha.org.

Biernacki, L. (2013). Panentheism and Hindu Tantra: Abhinavagupta's grammatical cosmology. In L. Biernacki and P. Clayton (Eds.). *God's body: Panentheism across the world's religious traditions*. New York: Oxford University Press, pp. 161–176.

Bynum, C. W. (1997). Presidential address: Wonder. *American Historical Review*, February, p. 4.

Glasenapp, H. Von (1999). *Jainism, an Indian religion of salvation*. New Delhi: Motilal Banarsidass, p. 413.

Griffith, R. T. H. (1889–92). *The hymns of the Rig-Veda translated with a popular commentary*. Benares: E. J. Lazarus and Co.

Haug, M. (1863). *Aitareya Brahmaṇam of the Rigveda, translation with notes*, Volume 2. Bombay: Government Central Depot, p. 9.

Isayeva, N. (1992). Rāmānuja, *Śrībhāṣya* II.II.27, in *Saṅkara and Indian philosophy*. New York: State University of New York Press, p. 4.

Jagaddhar, Z. (Ed.) (1947). Abhinavagupta, *Bodhapañcadaśikā with commentary by Harabhaṭṭaśāstrī*. Kashmir Series of Texts and Studies, Volume 76. Srinagar: Research Department of Jammu and Kashmir State, p.16. line 673. Downloaded from Muktabodha Indological Research Institute, www.muktabodha.org.

Maas, P. (2006). Samādhipāda: Das erste Kapitel des Pātañjalayogaśāstra zum ersten Mal kritisch ediert. Aachen: Shaker.

Olivelle, P. (1996). Upaniṣads: Translated from the original Sanskrit. New York: Oxford.

Rubenstein, M-J. (2008). *Strange wonder: The closure of metaphysics and the opening of awe*. New York: Columbia University Press, p.11.

Sanderson, A. (1988). Śaivism and the Tantric traditions. In S. Sutherland et al. (Eds.). *The world's religions*. London: Routledge and Kegan Paul, pp. 660–704.

Woo, J. (2009). Gradual and sudden enlightenment: The attainment of Yogipratyakṣa in the later Indian Yogācāra school. *Journal of Indian Philosophy*, **37**, 179–188.

Part 2

Therapeutic and clinical applications of meditation

Chapter 6

Traditional and secular views of psychotherapeutic applications of mindfulness and meditation

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Introduction

Over the past several decades mindfulness and meditation (MM) have become increasingly incorporated into psychotherapeutic and clinical settings. Early studies of clinical outcomes have given way to broad-ranging investigations of physiological and neurophysiological outcomes of a large number of different types of practice. There has been explosive growth in the rate of published mindfulness research, expanding from less than a dozen articles a year prior to 1998 to almost 500 per year by 2012 (Black 2014). Despite this rapid growth and greatly expanded interest in clinical practice, there has been little consensus about definitions of MM (Chiesa 2013). The difficulty stems in part from uncertainties about how to classify the many different meditation techniques in current clinical and traditional usage and from tensions between traditional and modern secular definitions and practices. There have been many attempts to classify secular meditation techniques based on differences in the religious or philosophical origins of the practices (Chiesa 2013; Sedlmeier et al. 2012), but these attempts grapple with issues of making generalizations to clinical practice based on descriptions of highly experienced or monastic meditators; grouping diverse traditions and techniques into broad and overlapping categories such as "Hindu," "Buddhist," and "secular mindfulness"; and creating distinctions among traditions whose philosophical origins may differ but whose techniques, particularly for the beginners who have populated some of the studies and most of the clinical applications, may for all practical purposes be identical.

What is a busy psychotherapist to do? As reviewed below, there are some well-standardized meditation and mindfulness-based intervention (MMBI) protocols, such as mindfulness-based stress reduction (MBSR; Kabat-Zinn 2005), mindfulness-based cognitive therapy (MBCT; Segal et al. 2002), and transcendental

meditation (TM; Orme-Johnson and Barnes 2014), for which there is an impressive evidence base and established clinical training, but there are indications that psychotherapeutic applications of MM outstrip both the standard protocols and the evidence base. Given the lack of definitional consensus and degree of eclecticism in clinical applications, we will explore issues in classification of MM types in current psychotherapeutic usage, with attention to growing utilization, historical origins, clinical applications, theoretical rationales, and evidence base. In addition, we consider directions for future research and practice.

Growing utilization of mindfulness and meditation

The expanding implementations of MM parallel growing consumer demand. National surveys have consistently noted that meditation and related practices are among the most commonly used complementary and alternative medicine (CAM) modalities in the United States to address health and mental health issues. The 2007 National Health Interview Survey (NHIS) found that 38.4% of adults in the United States had used some type of CAM in the past 12 months, with deep breathing exercises, meditation, and yoga being among the most common, used by 12.7%, 9.4%, and 6.1%, respectively, and showing increases from the rates of usage in the 2002 survey (Barnes et al. 2008). An in-depth analysis of the 2007 NHIS CAM data reported that a quarter of the 16.3% who used meditation and relaxation practices did so to treat a specific medical condition. In addition, those with greater psychological distress were more likely to use meditation and relaxation (Lee and Yeo 2013), so clearly there is a growing consumer perception that MM practices can be therapeutic.

Clinicians likewise increasingly embrace MM as therapeutic. Some work suggests that mindfulness is considered a theoretical orientation by many therapists. In a survey of more than 2000 North American practicing psychotherapists, mindfulness was the third most frequently endorsed theoretical orientation, utilized by 41%. It followed cognitive behavioral therapy (CBT; 79%) and family systems (49%) in popularity. More than a fifth of therapists taught skills such as meditation to at least half of their clients (Cook et al. 2010). MM has also been incorporated into regular clinical care on a broad scale. A survey of veterans' hospitals in the United States found that 72% offer meditation to their patients (VA Office of Research and Development 2011). Despite the fact that MM research for post-traumatic stress disorder (PTSD) is still an emerging area, MM appears to be in widespread usage among trauma therapists. A survey of expert clinicians about best practices in the treatment of complex PTSD identified MM as an appropriate second-line intervention, used in place of standard trauma therapy because of patient preference or

treatment non-response (Cloitre et al. 2011). A recent trauma therapist survey found that the majority use MM in some form in psychotherapy with traumatized patients, typically integrated into standard psychotherapy sessions rather than being offered in standardized forms such as MBSR or MBCT as an adjunct or stand-alone treatment (Waelde et al. in press). As reviewed below, existing research has primarily addressed the effects of standardized protocols, so these indications of widespread acceptability and individualized applications suggest that, for the moment at least, the practice has exceeded the evidence base.

Issues in modern secular classifications of mindfulness and meditation

Although the terms mindfulness and meditation are often used interchangeably, there are important distinctions between them. Mindfulness can be defined as a method, or as a state that represents the outcome of practice of the method, or as a stable trait (Nash and Newberg 2013). Many definitions of mindfulness emphasize it as a set of techniques that cultivate cognitive control skills leading to a state of ongoing present-moment attention. For example, Bishop and colleagues (2004) defined mindfulness as involving the self-regulation of attention on the immediate experience of mental events with an attitude of curiosity, openness, and acceptance. They regard mindfulness as a form of mental training developed by meditation practice, though psychotherapy that interferes with experiential avoidance can also cultivate this skill. This latter point, that meditation practice is not necessary to cultivate mindfulness, is an important one for clinical applications of mindfulness because, as reviewed below, some therapeutic applications involve mindfulness skills but not mindfulness meditation as such.

Meditation is a broader term, encompassing a set of practices and their associated outcomes. Because meditation has been practiced for many millennia in many cultures throughout the world, a unitary definition is difficult, even within the circumscribed domain of clinical applications of MM. Part of the confusion arises from the use of the term *meditation* to refer to both methods and resultant states of awareness (Nash and Newberg 2013). For example, meditation refers to techniques, such as breath focus or mantra repetition, but also to outcomes, such as refined states of consciousness. Walsh and Shapiro (2006) defined meditation as a family of self-regulation practices that focus on training attention and awareness to bring mental processes under greater voluntary control. The outcome of these practices is to develop general mental well-being and capacities such as calm, clarity, and concentration. This definition, with its emphasis on control of mental processes for psychological well-being, though

intended to be integrative of Eastern and Western traditions, probably better describes secular meditation as used in clinical practice rather than encompassing Eastern meditation traditions in general, which tend to espouse meditation as techniques for ultimately transcending mental processes to achieve nondual awareness (Dunne 2011; Josipovic 2010; Travis and Shear 2010a).

Concentrative versus mindfulness meditation

There have been notable efforts to classify meditation practices based on techniques. Many attempts distinguish between concentrative and mindfulness meditation. Concentrative meditation refers to practices that involve focus on a particular stimulus, such as the breath, whereas mindfulness refers to unselective attention to the flow of thoughts, sensations, and experiences. In this classification, concentrative meditation involves the narrowing and mindfulness the expansion of attention (Ivanovski and Malhi 2007). In actual practice, it is difficult to distinguish these two broad types of meditation with regard to the use of a specific attentional focus. For example, Bishop and colleagues (2004, p. 238) defined concentrative meditation as "restricting the focus of attention to a single stimulus such as a word, sound, or sensation. When attention wanders, it is redirected back to that single stimulus." This definition of concentrative meditation is very similar if not identical to their description of mindfulness meditation: "The client . . . attempts to maintain attention on a particular focus, most commonly the somatic sensations of his or her own breathing. Whenever attention wanders from the breath to inevitable thoughts and feelings that arise, the client will simply take notice of them and then let them go as attention is returned to the breath. This process is repeated each time that attention wanders away from the breath" (p. 232). Thus, breath-focused attention is variously referred to as a concentrative or mindfulness form.

To complicate matters, when a mantra is used, that is, the repetition of words, sounds, or phrases as an attentional focus, it is typically regarded as concentrative meditation (Cahn and Polich 2006; Ospina et al. 2007), despite the fact that definitions of mindfulness meditation do not specify the breath as the sole focus, mantra is often repeated in synchrony with the breath (Braboszcz et al. 2010), and conceptualizations of mantra describe it as a method to enhance present moment (Waelde 2015) and expanded states of awareness (Cahn and Polich 2006). Mantra repetition, like breath-awareness meditation used in mindfulness, tends to slow breathing and may alter autonomic tone (Braboszcz et al. 2010). Moreover, mantra meditations such as TM can produce increases in mindfulness (Tanner et al. 2009). These definitions of concentrative and mindfulness meditation leave open the question of whether mindfulness meditators practice concentrative meditation and whether those who use concentrative

techniques such as breath awareness and mantra ever experience mindfulness as an outcome.

The dichotomy between concentrative and mindfulness techniques has led to distinctions between entire schools of meditation and their respective practitioners. For example, a review classified TM, yogic, and *samatha* meditation as concentrative and Zen and *vipassana* as mindfulness (Ivanovski and Malhi 2007), even though Zen and *vipassana* rely on concentrative techniques (Lutz et al. 2008). One unfortunate outcome of this classification practice is the difficulty in specifying what mindfulness is and is not. In neuroimaging studies of meditation, experimental tasks involving meditation on a specific sensory focus may be classified as mindfulness or concentrative apparently depending on the school of meditation of the research participants. In one study, participants who had received 8 weeks of MBSR training focused on scanner sounds during the "mindfulness" meditation scan (Kilpatrick et al. 2011); in another, Tibetan Buddhists performed a "concentration" meditation task involving focus on a dot on a screen (Brefczynski-Lewis et al. 2007). Studies of different meditation techniques have often confounded technique with school and thus it is difficult to evaluate the results of studies and meta-analyses of the comparative effectiveness of different meditation types.

Focused attention, open monitoring, and nondual awareness

Fortunately, there is now general consensus that meditation styles can involve more than one technique. A widely cited classification offered by Lutz and colleagues (2008) referred to some Buddhist meditation types and their Western secular derivatives (i.e. mindfulness) as including both focused attention (FA) and open monitoring (OM). FA is a method of attentional training in which the meditator practices maintaining focus on a meditative object such as the breath, while OM is a form of non-discriminative awareness in which the meditator allows each experience to arise and dissipate in consciousness without either averting from or over-identifying with any one thought, feeling, or sensation and without maintaining any specific attentional focus. OM is considered the hallmark practice of mindfulness because of its non-reactive attention to present-moment experience. FA practice stabilizes attention and prepares the practitioner for OM, though the two practices are often used together within a single meditation session and over the course of training (Lutz et al. 2008). This definition clarifies matters by recognizing that mindfulness meditation includes both concentrative techniques and more openly receptive forms but does not address the issue of whether FA and OM might be involved in meditation forms that are not derived from Buddhist traditions. Subsequent reviews of the

distinction between FA and OM assume that mantra and visualizations are forms of FA (e.g., Braboszcz et al. 2010; Hölzel et al. 2011), thus raising the possibility that FA may be entailed in different traditions and techniques. In research and clinical practice, however, meditation that involves breath focus (with or without OM) is usually classified as mindfulness meditation, and meditation that includes alternate FA forms such as mantra and visualization, even if they include breath focus, are referred to as concentrative or "non-mindfulness" types, as though they never lead to OM and mindfulness. Interestingly, the mindfulness component of hatha yoga is recognized in its inclusion in MBSR (Dunn et al. 2013), showing that practices deriving from the Hindu tradition may include mindfulness. Thus, the concentrative versus mindfulness distinction persists in meditation research and the question of whether other forms of meditation besides those deriving from the Buddhist tradition ever involve mindfulness practices or states is inadequately addressed.

Criticism of the FA/OM taxonomy has stressed the imperative to incorporate an understanding of mental state changes as a factor in the conceptualization of meditation. Travis and Shear, for example, have proposed a third category in addition to FA and OM: *automatic self-transcending* meditation (Travis and Shear 2010a). By grouping meditation forms in terms of the cortical electrical activity most notably associated with each one, Travis and Shear noted that TM differentiated from other meditation forms they categorized as FA (loving-kindness meditation, qigong, and Zen) or OM (*vipassana*, sahaja yoga, qigong, and Zen) by exhibiting patterns of alpha-1 activity that were not observed in the other types. The authors inferred that TM was a form of meditation with techniques that, unlike FA and OM, are designed to transcend their own activity in an effortless way. In support of this conjecture, the authors cited an earlier study (Travis and Pearson 2000) in which phenomenological analysis of TM self-reports noted prominent themes of attenuated spatial and time awareness that were consistent with the authors' conceptualization of pure consciousness, distinct from phenomenological descriptions of FA and OM. This and other work have begun to address nondual awareness (NDA), a meditative state in which a critical distinction is lost or greatly attenuated: The distinction between the meditator as subject observing the contents or object(s) of awareness. NDA is distinct from FA and OM states that maintain the dualism of subject versus object (Dunne 2011; Josipovic 2010; Travis and Shear 2010b). Despite the fact that Lutz and colleagues defined FA and OM as hallmarks of mindfulness meditation, Dunne (2011) asserted, without any evidence or illustration, that MBSR involves NDA, which may make it similar to TM and other types of meditation that are thought to produce NDA. Although the TM tradition regards the NDA state as attained effortlessly (Travis and Shear 2010a), as reviewed below,

traditional sources regard NDA as an advanced state of meditation, so it is unclear whether and how states of NDA are involved in MMBI.

Traditional versus secular

The preceding review of classification issues was drawn from the secular MM literature. Recently, there has been controversy about the extent to which definitions, practices, and descriptions of meditative states should be guided by fidelity to Buddhist teachings or whether secular MM constitutes a distinct domain that may draw upon wisdom traditions but is also guided by scientific and practical considerations. Several authors have called for fidelity to Buddhism, based on the fact that mindfulness is at the heart of Buddhist teaching, and have emphasized that MM clinicians and researchers should have mindfulness training, personal meditative attainment, and collaborations with qualified Buddhist teachers (Grossman and Van Dam 2011; Van Gordon et al. 2015). Other authors have pointed out constraints involved in scientific and clinical applications of mindfulness, such as the need to operationally define and measure key constructs and present techniques in a secular way in order to render them more broadly acceptable (Baer 2011). Kabat-Zinn (2003) takes the position that Buddhist mindfulness teachings are dharma, universal truths, like the laws of physics, and as such are not exclusively Buddhist. Thus, aside from the question of whether there should be a separate, secular mindfulness domain, this controversy raises the issue of which wisdom and secular traditions may contribute to the science and practice of mindfulness. Kabat-Zinn's dharma perspective contends that mindfulness concerns the universal human capacity of attention, which implies that it has likely been explored by various traditions throughout the course of human history. In sum, who owns mindfulness? Is it an exclusively Buddhist practice? Is mindfulness entailed in other religious or philosophical traditions? Is there a new type of secular mindfulness, which has been drawn but yet is distinct from its historical origins? Recent commentary suggests that the distinction between secular mindfulness and traditional Buddhism is not a clear one, especially to the extent that the secular mindfulness community has equated mindfulness with Buddhism teachings (Purser 2015).

In clinical practice, the interchange between wisdom and secular traditions raises many issues, such as the sort of training required for competent clinical practice, the boundaries between one's personal, spiritual, or religious practice (or lack thereof) and therapeutic procedures, and ethical issues about the "Trojan horse" practice of employing techniques that may seem explicitly Buddhist but are presented as though they are free from any religious connotations that may be inconsistent with clients' own faith traditions. To the first point, although standardized MMBIs such as MBSR, MBCT, and TM have training programs,

many therapists may not be using the standardized protocols in therapy. As reviewed above, MM techniques are in widespread use and there are indications that psychotherapeutic applications may be incorporated into standard psychotherapy in individualized ways. This eclecticism means that psychotherapists may see spiritual teachers as appropriate clinical trainers in the MM domain, which would distinguish it from other forms of psychotherapy practice that are generally understood to require professional training (Waelde et al. in press). Labeling mindfulness (and by extension meditation) as Buddhist also implies that these therapeutic procedures represent the integration of religion into psychotherapy, raising important issues about therapeutic boundaries, such as how to frame MM procedures for the client, whether MMBI therapists remain therapists or become meditation teachers, and whether psychotherapy clients should be invited to meditation classes in the therapist's own dharma community (Pollak et al. 2014).

There may be several advantages to maintaining the distinction between religious and clinical practice. Fundamentally, the aims of Buddhist and clinical MM practice are different. Despite Van Gordon et al.'s (2015, p. 7) call for Buddhist and scientific communities to work together to validate interventions that are "effective according to both clinical and spiritual criteria," the aim of Buddhist meditation practice, namely experience of "the single, unchanging, and all-pervasive nature of emptiness" (Van Gordon et al. 2015, p. 4) does not seem a close match with the immediate clinical needs of psychotherapy clients. Part of the issue seems to be the conflation of the Buddhist concept of suffering, *dukkha*, with the sorts of suffering clients present in psychotherapy (Lindahl 2014). Moreover, the reasoning that "the Buddha's teachings can be likened to an all-purpose medicine" (Van Gordon et al. 2015, p. 5) reflects a mind-body dualism common in religious and philosophical teachings (Forstmann and Burgmer 2015) that would have us prescribe Buddhism in place of psychotherapeutic, but not medical, intervention.

Much research has been conducted with meditation adepts from different religious or spiritual traditions and it is not clear what implications these studies have for clinical practice. Participants in these studies are often monastics or persons with many thousands of hours of practice time in spiritual or religious contexts. Although studies of meditation adepts have shed light on the neuroscience of advanced meditative states, there are fundamental differences from clinical applications in terms of the types of participants and the aims, types, and amount of practice. For example, Lutz and colleagues investigated the neural circuitry of compassion meditation among experts (Lutz et al. 2008). The participants in this study were selected because they were recognized as experts in Buddhist meditation, with between 10,000 and 30,000 hours

of meditation practice. In contrast, participants in clinical MMBI studies are typically selected because of a diagnosed disorder or condition. Likewise, the aims of MM practice among adepts are different from clinical aims. In the Lutz et al. (2008) study, "the long-term goal of meditators undergoing such training is to weaken egocentric traits so that altruistic behaviors might arise more frequently and spontaneously" (p. 1). In contrast, psychotherapy clients typically participate in MMBI with a goal of symptom reduction. The two types of practitioners may be exposed to different types of practices, with experts typically receiving instruction from religious/spiritual teachers (rather than psychotherapists) in contexts such as retreat settings that allow for extended practice periods, in contrast to the brief meditation training usually allocated in MMBI. Although comprehensive descriptions of experts' training experience were not provided, it seems reasonable to speculate that the experts in the Lutz et al. (2008) study had received instruction in a variety of meditation practices over the course of their training, in preparation for and flowing from the specific compassion meditation that was the focus of the investigation. Finally, there can be no doubt that psychotherapy does not involve thousands or tens of thousands of hours of meditation instruction and practice. Evidence is mounting that mechanisms of meditation may be very different for novices versus experts (Chiesa et al. 2013). As Lutz and colleagues pointed out, studies of experts are vital for understanding the long-term mechanisms and outcomes of meditation, but implications for clinical practice are not straightforward.

Given these fundamental differences between spiritual and clinical MM practice, differentiating the two would clarify matters greatly. Questions about whether MM training in clinical practice should incorporate elements of the spiritual traditions would be guided by clinical necessity and acceptability. Adaptations of traditional practices to clinical problems would be guided by a keen understanding of the match between the mechanisms and outcomes of a particular practice and the nature of the problems to be treated. Similarly, distinctions among MM practices would be guided by specifics of the techniques and their mechanisms of outcome for particular disorders or conditions, rather than by classification into broad traditions such as Buddhist and Hindu. As a very practical matter, interpretation of neuroimaging data or clinical trials outcomes must make reference to clear behavioral descriptions of meditation tasks that were employed. Breath-focused meditation among beginning practitioners may for all practical purposes be identical across traditions. Further, meditation techniques used in clinical practice may bear incomplete similarity to their wellspring traditions. Several recent reviews have criticized definitions and methods of mindfulness in clinical practice as insufficiently representing the breadth of the tradition (Chiesa 2013). It is unclear to what extent clinical and

research applications of meditation with novices resemble advanced techniques and mental states described in traditional accounts. In addition, broad traditions cannot be parsed according to technique. As reviewed below, both Hindu- and Buddhist-inspired meditations include a succession of techniques that flow from FA as attention training through increasingly refined states of awareness involving nondual awareness, or suspension of the distinction between the self as the observer and the object being observed (Dass and Diffenbaugh 2013; Dunne 2011). Both broad traditions employ mantra repetition, movement techniques, and philosophical frameworks that may shape the idioms used to describe meditation experiences, so differentiating Buddhist and Hindu traditions with reference to specific techniques such as mindfulness or mantra is problematic.

Contemporary conceptualizations of MM reflect a range of techniques and resulting states of awareness, from meditation on a specific focus as a means to stabilize attention, to nonselective attention to the phenomenal field, to surrender to nondual awareness. These conceptualizations have largely been drawn from Hinduism and Buddhism, both of which are vast traditions containing diverse schools of thought. However, for the purposes of addressing the types of MM in contemporary psychotherapeutic usage, it is worth considering a few overlaps between these two broad traditions in terms of the FA/OM/NDA distinction and the developmental trajectory of meditation training.

A brief consideration of historical origins of clinically applied MM

Clinical applications of MM are primarily drawn from the Buddhist and Hindu traditions, particularly Buddhist teachings about mindfulness. Both root traditions are vast and include substantial heterogeneity across their several millennia of history, so the following review addresses some features of these two traditions that have particular relevance to psychotherapeutic applications.

Buddhist tradition

The term *mindfulness*, first used in English as a translation of the Pali noun *sati* (Bodhi 2000), denotes a state of present moment nonreactive awareness that is associated with some forms of meditation. Historically, mindfulness has been regarded in the Buddhist tradition as a foundational state of enhanced awareness that plays a pivotal role in methods to reduce suffering and achieve human liberation. The amelioration of the suffering associated with the human condition was a common aim of the Hindu and Buddhist meditation traditions from which the modern clinical use of mindfulness is derived (Eberth and Sedlmeier 2012).

Several ancient texts are central to the meditation traditions that inspired early clinical applications of mindfulness. An important work in the canonical texts of early Buddhism, the *Satipatthana Sutta* (foundations of mindfulness) (Walshe 1987) is especially instructive in the present discussion. The *Satipatthana Sutta* explained that mindfulness is a method for the elimination of suffering and outlined four focal points for mindfulness: Breathing, feeling, consciousness, and mental objects. The mental objects include negative emotions (e.g. anger); perceptual processes with which the mind identifies; sensory stimuli; positive emotions conducive to spiritual development (such as tranquility, equanimity, and concentration); and the Four Noble Truths (the reality of suffering, the link between suffering and clinging, the possibility of relinquishing clinging, and the method used to do so). The importance placed on FA in MMBI is reflected in breath-focused Buddhist meditative techniques.

Other early texts where the Four Noble Truths are explained in depth, for example the *Mahasatipattana Sutta* (greater discourse on the foundations of mindfulness), emphasized the inherently transient nature of existence, the inevitability of hardship, the compounded nature of all phenomena including the self, and the use of meditation to develop increasingly refined states of consciousness predicated on foundational awareness of the reality of suffering (Walshe 1987). That is, mindfulness is an awareness technique, but the texts were also quite specific about broader psychological and existential themes beyond the breath to which this enhanced awareness should be subjected, including the necessity of ethical behavior and insights regarding the interdependence of the self with all phenomena (Williams 2000). A later Buddhist movement, the Mahayana, emphasized the necessity of compassionate behavior as integral to this enhancement of awareness, which in turn was supported by the practitioner's acquisition of a non-clinging attitude (Williams 2009). Scrutiny of the contemplative traditions from which mindfulness derives suggests that meditation can induce states of awareness that extend upon a spectrum that is not adequately captured by the FA/OM taxonomy or the term mindfulness. For example, an early Buddhist text, the *Ariyapariyesana Sutta*, outlines a spectrum of meditative development that *begins* with mindfulness and equanimity, and then proceeds via a series of increasingly refined absorptions (*jhanas*) to a dimension of consciousness in which all mental activity and self-awareness cease altogether (Walshe 1987), a state sometimes described as NDA (Dunne 2011). In these Buddhist texts the development of awareness takes place alongside insights into the nature of existence and the necessity for compassionate and ethical conduct. Despite the fact that secular writing has emphasized mindfulness as a hallmark of Buddhist meditation, a review indicates that in the Buddha's original teachings, mindfulness serves the purpose of

regulating attention on the object of meditation (Van Gordon et al. 2015). Thus, in the Buddhist canon at least, it may not be accurate to make a sharp distinction between concentrative and mindfulness meditation.

Hindu tradition

These ideas about types of meditative awareness and the need for ethics and insight have their parallels in ancient meditation texts drawn from Hindu traditions. The earliest reference to breath-focused meditation is in the *Ṛg Veda*, the oldest text in the Hindu canon, which dates from about 1200 BCE (Flood, 1996). The earliest meditation reference in the *Upaniṣads* is in the oldest one, the Pre-Buddhist *Bṛhadāranyaka Upaniṣad*, which states that after becoming calm and focused, the meditator can perceive unity with all things. The *Maitrī Upaniṣad*, dating from about 600 to 300 BCE, contains an early formulation of the facets of yoga, involving *prānāyama* (breathing techniques), *tarka* (inquiry), *pratyāhāra* (sense withdrawal), *dhāranā* (concentration), *dhyāna* (meditation), and *samādhi* (absorption). Patañjali's *Yoga Sūtra*, dating from about 100 BCE to 500 CE, added certain preparations for meditation practice, such as *yama* (ethical principles), *niyama* (self-restraint), and *āsana* (yoga posture) to these six facets to formulate eight-limbed or *ashtānga* yoga (Flood 1996).

In the *Yoga Sūtra, dhāranā* is the first level of awareness and involves meditation on a particular object, such as a feeling, thought, or image. In this stage of meditation, the focus is at times broken and thus concentration is not uninterrupted. It is important to note that concentration becomes increasingly subtle; that is, the initial focus is on the object's gross aspects and over time concentration reveals increasingly subtle aspects of the object. When *dhāranā* is continuous, it becomes *dhyāna*, the uninterrupted flow of mental effort. The one-pointed concentration involved in *dhyāna* requires control of desires, because they constitute a distraction (Dass and Diffenbaugh 2013). These first two stages may correspond to degrees of FA because they involve training the attention to focus on an object of meditation.

With practice, *dhyāna* develops into *samādhi*, or high consciousness, with different stages of *samādhi* reflecting degrees of what might elsewhere be described as OM and NDA. The initial stages of *samādhi* are termed *samprajñāta samādhi*, or the *samādhi* of wisdom. In *samprajñāta samādhi* the mind is still fluctuating in gross levels of object-based cognition. The first stage of *samādhi* (*savitarka samādhi*; absorption with reasoning) involves ordinary mental functions, such as experiences of the senses and thoughts and feelings that accompany those sense perceptions (Dass and Diffenbaugh 2013). *Savitarka samādhi* resembles the description of OM because it entails awareness of the flow of experience. As meditation experience progresses, the

meditator transcends all fluctuations of the mind and no longer relies on an object of meditation; subject and object of meditation no longer exist in *asamprajñāta samādhi*. S*amādhi* results in knowledge about the nature of existence itself (Dass and Diffenbaugh 2013).

The *Yoga Sūtra* are generally interpreted as descriptive of concentrative meditation because they appear to describe stages of meditation on a concrete object. Indeed, at the initial stages, the focus may be concrete but progresses through successive refinements. The transition from focus on a particular object in *dhyāna* to *savitarka samādhi* is quite distinct and is predicated upon achievement of *vairāgya*, or detachment from "the colorings pertaining to objects in the mind" (Dass and Diffenbaugh 2013, p. 39). Thus, the *Sūtra* describes stages of meditation that begin with focus on a particular object such as the breath, progress to awareness of the flow of experience without clinging to a particular object of attention, and culminate in states of NDA. The "objects of meditation" described in the *Sūtra* refer to all the contents of awareness prior to loss of the self–object distinction in *asamprajñāta samādhi*, rather than necessarily referring to specific concrete objects.

Correspondences with the categories of FA, OM, and NDA

The correspondences of the terms FA, OM, and NDA to meditative states in the *Yoga Sūtra* and in Buddhist literature are approximate at best. Hindu and Buddhist teachings are vast, living traditions and the cited texts do not represent these traditions in their entirety. These traditions offer the accumulated wisdom of meditation masters over millennia and as such may offer valuable insights about the nature and development of awareness. The three broad categories of FA, OM, and NDA describe ways that attention is deployed, but both Hindu and Buddhist traditions describe additional gradations of awareness and aspects of the practice, such as the development of qualities such as self-restraint and detachment. Further, correspondences between these three categories and Buddhist and Hindu writings do not imply that the aim of Buddhist or Hindu practice corresponds to the aim of meditation in MMBI. Descriptions of the developmental trajectory of meditation in the traditional literatures may have little direct clinical relevance because the context, types, and degree of practice in MMBI may bear little resemblance to these root traditions. The correspondences do suggest that there is overlap among traditions; mindfulness may not occur exclusively in the course of Buddhist meditation, though of course some forms of Buddhist meditation may be particularly effective ways to learn mindfulness. One session of both sham and mindfulness meditation have been shown to produce increases in mindfulness relative to control (Johnson et al. 2013), lending credence to the idea that mindfulness is a natural human

capacity that can be cultivated by religious and spiritual activities but develops outside of these contexts as well.

These brief considerations of some aspects of the Hindu and Buddhist origins of contemporary MM practice should reassure clinicians that although meditation traditions offer much insight about ways to cultivate qualities and attentional states conducive to well-being, the capacity for being present in the moment is a human one, cultivated by a variety of means, including periods of dedicated practice called meditation. Psychotherapeutic applications are a recent development in this millennia-old tradition and can make use of techniques that have withstood the test of time.

Applications of MM in psychotherapy

The preponderance of research about the clinical utility of MM has used standardized MMBIs such as MBSR, MBCT, TM, and others. However, in actual clinical practice, the use of standardized protocols may be the exception rather than the norm. A recent survey indicates that individualized use of MM techniques, such as breath-focused awareness, may be the most common clinical application of MM (Waelde et al. in press), and there is a growing clinical literature about applications of MM techniques within conventional psychotherapy (Germer 2005; Pollak et al. 2014). Applications of MM in psychotherapy might be thought of as occupying a continuum of usage intensity, ranging from the use of mindfulness by the therapist only to standardized protocols applied as adjuncts or stand-alone treatment.

A spectrum of usage intensity

A burgeoning literature describes the benefits of MM practice for psychotherapists themselves. Recent work shows that a brief training program can increase therapist skills and knowledge related to mindfulness (Aggs and Bambling 2010). A prospective study found that psychotherapists in training who participated in nine weeks of Zen meditation had better therapeutic course and treatment outcomes than non-meditating controls (Grepmair et al. 2007). In post-disaster settings, MM training may address therapists' trauma symptoms related to their own disaster exposure and losses and promote coping self-efficacy (Hechanova et al. 2015; Waelde et al. 2008). It has been suggested that mindfulness training can enhance therapist qualities related to common factors of effective treatment, such as affect tolerance, acceptance, empathy, equanimity, paying attention, and accepting the limits of psychotherapy (Fulton 2005). Moreover, therapist training is thought to be a prerequisite to the applications of MM in psychotherapy, particularly for the more involved applications.

Perhaps the most common application of MM in psychotherapy is the ad hoc use of breath-focused attention to help the client become more aware of inner experience, thoughts, and feelings during the session. In this implementation, the therapist integrates MM techniques into conventional psychotherapy with the aim of helping the client to tolerate other therapeutic procedures, such as exploration of trauma memories (Waelde 2015). The therapist may also introduce everyday mindfulness exercises, such as a practice of breath awareness during daily activities or stressful moments. Breath awareness in daily life may be a particularly accessible practice for clients; it was used by a majority of MBSR participants three years after the program, whereas only a minority practiced sitting meditation (Miller et al. 1995). Depending on client need and motivation, the therapist may teach very brief, breath-focused sitting meditation to develop present moment awareness and cultivate acceptance, with a focus on developing ways for the client to practice that are easy and pleasant (Germer 2005). Standardized MM protocols teach clients to use longer periods of daily MM practice. Research has shown that the amount of daily sitting meditation practice is associated with increases in mindfulness and decreases in psychological symptoms (Carmody and Baer 2008; Waelde et al. 2004, 2008). Although there has been much speculation that standardized protocols such as MBSR might be useful adjuncts to conventional psychotherapy, one study showed greater termination among clients receiving adjunctive MBSR relative to those who received psychotherapy alone (Weiss et al. 2005). Most of the research about MMBI has examined it as a stand-alone treatment, though as reviewed below, only a subset of studies have included participants with diagnosed disorders.

Standardized applications of MMBI

The mindfulness-based interventions that have received the most attention in clinical applications are all multi-component interventions. MBSR includes instruction in sitting mindfulness meditation, body scan meditation, hatha yoga, and mindfulness in daily life, though the cultivation of present moment awareness is considered to be the common factor of all these activities. The program is a group-based eight-week intervention that includes discussion about how to apply the practice in daily life and involves recommended homework of formal sitting mindfulness meditation and mindfulness in daily life (Kabat-Zinn 2005). MBSR, unlike many of the MMBIs that were derived from it, doesn't include conventional psychotherapy. MBCT is a group-based eight-week program that integrates elements of MBSR with psychoeducation and cognitive-behavioral strategies for depression (Segal et al. 2002). Mindfulness-based relapse prevention (MBRP) integrates the components of MBSR with

relapse prevention, based in CBT, for substance dependence treatment (Bowen et al. 2011).

Other psychotherapies have incorporated mindfulness without including formal practice of sitting meditation. Acceptance and commitment therapy (ACT) integrates mindfulness with concepts of valued living, willingness, and the distinction between self-as-context versus self-as-content (Hayes and Strosahl 2010). Dialectical behavior therapy (DBT), also considered a mindfulness-based approach, involves mindfulness exercises to promote self-monitoring as part of emotional regulation skills training in the treatment of borderline personality and other disorders (Linehan 1993).

The classification of MMBI according to the religious origins of the practice has led some forms of meditation, such as kindness-based meditation (KBM), to be regarded as mindfulness because they have historically been practiced alongside mindfulness meditation in Buddhist tradition. A recent review indicated that KBM includes several related types of meditation, such as loving-kindness and compassion meditation, that focus on generating feelings of loving-kindness or compassion toward others (Galante et al. 2014). KBM differs from mindfulness approaches because the aim of the meditation is not to just observe experience but to create a different type of experience involving loving and compassionate feelings toward others.

As mentioned earlier, MMBIs that involve mantra repetition have been long regarded as "non-mindfulness" types. TM, the best-researched among them, uses the silent repetition of a mantra or sound to produce transcendental consciousness, or heightened awareness of self and the world; mindfulness is presumed to be a by-product of that heightened awareness (Tanner et al. 2009). Implementations of TM in clinical studies have used a combination of individual and group-based formats and the intervention does not include elements of hatha yoga or conventional psychotherapy (Orme-Johnson and Barnes 2014).

Inner resources for stress (IR) is a group-based eight-week intervention that uses mindfulness meditation, breath-focused imagery and mantra repetition, and mindfulness in daily life with practices for letting go of thoughts, feelings, and sensations as they arise. In IR, breath-focused mantra and imagery, as more structured forms of FA than simple breath awareness, are used to provide helpful structure for practitioners who otherwise would not be able to tolerate mindfulness practice because of intrusive thoughts and feelings (Butler et al. 2008; Waelde et al. 2004, 2008).

The mantram repetition program (MRP), which has been used for military veteran PTSD and other conditions, is a group-based meditation intervention that uses a client-selected sacred word, repeated silently throughout the day, as a method to train attention and regulate emotion. In MRP, mantram is

deliberately spiritual, to call on spiritual resources, and does not rely on sitting meditation, to increase the portability of the practice. Mantram helps to manage unwanted thoughts by directing "attention away from negative thoughts in advance, thereby reducing emotional distress" (Bormann et al. 2013, p. 260).

With the exception of MRP, these standardized MMBIs all incorporate mindfulness in some way, though MRP includes the FA form of mindfulness practice, and mindfulness in TM practice is thought to be a result of the NDA achieved by the practice. Mindfulness itself, like the MMBI in which it is incorporated, may contain multiple components that produce distinct treatment mechanisms.

Theoretical rationale for MMBI

Mindfulness has been previously defined as comprising four components: Attention regulation, body awareness, emotion regulation, and change in perspective on the self (Hölzel et al. 2011). As a set of self-regulatory mechanisms, mindfulness has been theorized to comprise at least two distinct neurophysiological pathways. The first, *top-down* pathway involves enhanced attention capacity attenuating automatic emotional reactivity, while the second, *bottom-up* pathway involves attenuated limbic activity without the need for conscious control. Neuroimaging evidence indicates that FA primarily recruits top-down processing, and OM recruits bottom-up processing (Chiesa et al. 2013).

Attention regulation and reappraisal

The attention regulation component of mindfulness (Hölzel et al. 2011) is theoretically congruent with the concept of top-down processing (Chiesa et al. 2013) and can be understood as an enhancement of top-down appraisal mechanisms that remediate negative attributional biases (Beck 2008). This aspect of the clinical utility of mindfulness is consistent with the theory that appraisal can refine the meaning of emotions and reduce the perceived unpleasantness of negatively valenced stimuli (Panksepp 1998). It is this reappraisal dimension that Kabat-Zinn stressed in his formulation of mindfulness as a practice of enhanced, deliberate, directed attention that entails "paying attention in a particular way: On purpose, in the present moment, and nonjudgmentally" (1994, p. 4). Several subtly contrasting empirical constructs subsequently emerged that similarly emphasized this reappraisal dimension. Hayes (2004), for example, described this process as cognitive defusion, while other related constructs included reperceiving (Carmody et al. 2009). Bishop and colleagues' (2004) definition emphasized an attitude of openness and acceptance. Baer and colleagues (2008) outlined a five-facet

model of mindfulness in which two of the facets are non-judging of inner experience and non-reactivity to inner experience. All of these definitions emphasize the appraisal function of present moment attention.

Emotion regulation

The emotion regulation component of mindfulness (Hölzel et al. 2011) is theoretically congruent with the concept of bottom-up processing (Chiesa et al. 2013) and can be understood in terms of the capacity of mindfulness to reduce the automaticity of dysfunctional emotion-cognition processing and induce emotional stability. Neuroimaging evidence supports this view. For example, one study showed that mindfulness beneficially impacts core physiological stress regulatory processes, the hypothalamic-pituitary-adrenal axis and the neuro-endocrine system (Kasala et al. 2014). Studies of the physiological impact of loving-kindness meditation are similarly consistent with a framework of the clinical utility of mindfulness in which enhanced emotional awareness is a highly salient factor. Long-term practitioners of Theravadan loving-kindness meditation demonstrated increased gray matter volume relative to novices in the right angular and posterior hippocampal gyri, structures associated with empathy and social cognition (Leung et al. 2013). Desbordes and colleagues (2014) operationalized mindfulness in clinical terms as equanimity, which the authors defined as a form of emotional regulation strategy characterized by rapid disengagement from an emotional stimulus followed by a quick return to physiological baseline.

Body awareness

Like emotional awareness, the body awareness component of mindfulness (Hölzel et al. 2011) is also theoretically congruent with the concept of bottom-up processing (Chiesa et al. 2013). Indeed, the emotional and body awareness components can be conceptualized as closely overlapping, based on the theory that emotions are bodily-based signals that drive decision making (Damasio 1996). Body awareness and emotional awareness in these terms would overlap closely based on the theory of emotions as encoding bodily action tendencies. The role of mislabeled body states in some clinical disorders (Critchley et al. 2013) and the role of mindfulness in increasing interoceptive accuracy (Farb et al. 2013) provide a framework for conceptualizing the clinical utility of the body awareness component of mindfulness. Neuroimaging evidence supports a view that regular meditation is associated with functional changes in interoceptive processes. For example, meditation has been associated with functional changes in interoceptive and homeostatic processes, including enhanced prefrontal cognitive reappraisal of pain unpleasantness marked by

increased anterior cingulate cortex activity and dorsal anterior insula (Lutz et al. 2013), reduced activity in the prefrontal cortex and thalamus (Orme-Johnson et al. 2006), and by structural changes including prefrontal cortical thickening (Kang et al. 2013), increased white matter fractional anisotropy (Tang et al. 2012), and higher gray matter density in the supplementary motor area, ventral palladium, and brain stem (Kumar et al. 2014). It should be noted, however, that both top-down and bottom-up conceptualizations of mindfulness treatment mechanisms have been proposed as salient in the clinical efficacy of mindfulness for disorders characterized by problems with body awareness (Lutz et al. 2013; Zeidan et al. 2012).

Changes in self-perspective

Mindfulness is also thought to produce changes in self-perspective consistent with detachment from identification with a static sense of self (Hölzel et al. 2011). One proposed common factor in MMBIs is a principle known as *decentering*, defined as the capacity to observe thoughts and feelings as mental events rather than as permanent truths about the self or reality (Fresco et al. 2007), and as the decoupling of reflective self-awareness from experiential awareness (Hayes 2004). Decentering is a key concept in several MMBIs including ACT, DBT, and MBSR (Hayes 2004; Kabat-Zinn 2005; Linehan 1993). One of the central components of ACT's theory of therapeutic change is that mindfulness can create a distance between a maladaptive reified sense of self and the sensory reality of the present moment, creating a more adaptive sense of self that is less attached to any single perspective. Preliminary evidence regarding the neural correlates of this decoupling of sensory and reflective modes of self-awareness has indicated the role of the functional interrelationship of two biological neural networks serving experiential and reflective modes of self-awareness, respectively, and their anti-correlation as the mechanism of decentering (Farb et al. 2007).

In sum, there is accumulating evidence that mindfulness meditation works on multiple components of functioning that may be relevant to psychotherapy. Do the effects of mindfulness extend to symptom relief and improved psychological well-being? The next sections review evidence for effectiveness and the impact of individual MMBI treatment components.

Meta-analyses of MMBI

Hundreds of studies have been conducted about the effectiveness of MMBI and there are numerous meta-analyses that offer an overview of treatment effects. Goyal and colleagues (2014) examined the effects of structured MMBI, including

mindfulness, mantra, and other meditation programs, in 47 randomized controlled trials (RCTs) with active control conditions involving 3515 participants. This meta-analysis of MMBI for psychological stress and well-being concluded that mindfulness programs had small pre/post effects on depression, anxiety, and pain, but no effects relative to active control groups. The mantra programs did not improve any of the outcomes, but there was insufficient evidence to evaluate them, owing to the small number of trials that were included and the fact that some mantra studies included patients with very low symptom levels at pretreatment (Goyal et al. 2014).

Some meta-analyses have examined effects of mindfulness programs specifically. A recent meta-analysis of 209 psychological and medical outcome studies of mindfulness-based therapy (MBT) conducted with a total of 12,145 participants found that MBT was associated with improvements in depression and anxiety. MBT was moderately effective in pre/post studies, was more effective than supportive therapies, but was not significantly more effective than relaxation, psychoeducation, traditional CBT, or behavior therapy at follow-up. However, mindfulness was associated with positive clinical outcomes across the 45% of studies that included a mindfulness measure, suggesting that mindfulness has some role in MBT effects (Khoury et al. 2013).

The effects of MBT for current diagnoses of depression or anxiety were addressed in a meta-analysis of 12 RCTs involving 578 participants. MBTs were moderately more effective than control conditions for primary symptom severity related to depressive, but not anxiety, disorders. Like the Khoury et al. (2013) and Goyal et al. (2014) meta-analyses, MBTs weren't significantly more effective than active control conditions. In addition, MBCT, but not MBSR, showed significant effects on primary symptom severity (Strauss et al. 2014). Both the Khoury et al. (2013) and Strauss et al. (2014) studies found similar average attrition rates (approximately 15–16%), which were similar to those observed in CBT studies (Strauss et al. 2014).

The effects of KBM were addressed in a meta-analysis of 22 studies involving 1747 participants, of which only three studies recruited patients and seven included an active control condition. In comparison to inactive control conditions, KBM was moderately effective in decreasing depression, and in increasing mindfulness, compassion, and self-compassion, but results against active controls were inconclusive. The authors noted that KBM may be challenging for some, at least at the beginning stages of practice (Galante et al. 2014).

Overall, meta-analyses indicate that MMBIs produce pre/post changes in mindfulness, some psychological symptoms, and other indicators of well-being, but evidence for comparative effects among currently diagnosed patients is sparse, indicating that the MM component of studies does not seem to add to

treatment effects beyond what is gained from participation in other active treatments, such as CBT, behavior therapy, or psychoeducation. The lack of superiority is not evidence for the equivalence or non-inferiority of MMBI relative to active control conditions; such conclusions require results from specifically designed and well powered clinical trials (Goyal et al. 2014; Greene et al. 2008). Research addressing the effects of specific MMBI treatment components would allow interventions to be more closely tailored to specific psychotherapeutic applications and could perhaps lead to more successful interventions.

Treatment component studies: Are treatment mechanisms specific to MMBI?

As the foregoing review indicates, there is accumulating evidence that MMBI may affect therapeutic change through attention regulation, enhanced body awareness and emotion regulation, and changes in the sense of self. Because MMBIs are group-based multi-component interventions, dismantling studies are needed to isolate the treatment components and differentiate them from non-specific effects of treatment, such as therapist effects or the benefits of group support, and from other active treatment components, such as breath-focused awareness practiced outside of mindfulness meditation, exercise, and cognitive therapy. Dismantling and other treatment component studies could also address questions about whether mindfulness as a form of attending to the present is specific to Buddhist-based mindfulness interventions or is a more broadly evoked capacity.

Some studies of MMBI components suggest that mindfulness may be the product of both attention and breath regulation that is not specific to mindfulness meditation. A single-session mindfulness versus sham meditation study of college students found that both were associated with increased states of mindfulness and improved mood and distress relative to a book-reading control group. A convincing sham condition would control for the demand characteristics and expectancy effects associated with mindfulness practice; in this study the sham and mindfulness groups did not differ in the extent to which they felt they were meditating during the exercises (Johnson et al. 2013). The sham directions to sit quietly and breathe deeply suggest that attention to breath regulation may be associated with increased mindfulness and other outcomes, a possibility explored by studies of the effects of breathing exercises. A study of inhalation/exhalation (i/e) ratio found that lower ratio breathing was associated with greater mindfulness than the high ratio condition (Van Diest et al. 2014). Although mindfulness instruction typically doesn't suggest modifications to respiratory rate, mindful awareness of breathing often results in spontaneous

breath slowing (Kristeller and Rikhye 2008), which is in turn related to a shift toward lower i/e ratio (Van Diest et al. 2014). Even a brief, 15-minute period of breath-focused attention was associated with better mood and emotion regulation among college students relative to unfocused attention and worrying (Arch and Craske 2006), suggesting that breath-focused attention, rather than extensive training in OM mindfulness, was associated with better outcomes.

The effects of MMBI components on psychological well-being have been tested in sham-controlled designs. For example, a three-session mindfulness intervention with college students significantly reduced overall negative mood and heart rate relative to sham meditation and a control, though the sham meditation also produced pre/post reductions in state anxiety and tension (Zeidan et al. 2010), suggesting there was a common factor to both conditions.

Physical exercise is a component of MBSR and related MMBI in the form of hatha yoga. Exercise is well known to produce substantial treatment effects on depression (Josefsson et al. 2014), which raises the question of the relative contributions of MMBI treatment components to mood and well-being outcomes. Pre/post comparisons of participants in MBSR classes revealed that practice time for mindful yoga was associated with more improvements in outcome variables than body scan, sitting meditation, or practice in daily life; notably, amount of practice in daily life was unassociated with pre/post improvements (Carmody and Baer 2008). Similar findings of the differential effectiveness of hatha yoga come from a randomized study of the three primary components of MBSR-related MMBI, namely sitting mindfulness meditation, mindful yoga, and body scan, which found that yoga was associated with greater improvements in psychological well-being than the other two components, and that both sitting meditation and hatha yoga were associated with greater pre/post improvements in emotion regulation than body scan. Participants in the sitting meditation condition had greater improvements in non-evaluative attention than the body scan participants, as might be expected given the repeated and explicit instructions against judging experience in mindfulness meditation (Sauer-Zavala et al. 2012). Intriguingly, an RCT of MBSR versus aerobics for social anxiety disorder found that MBSR and aerobics had equal therapeutic outcomes (Jazaieri et al. 2012). Similarly, a comparison of MBSR and Argentine tango for major depression reported nearly identical effect sizes for MBSR and tango in terms of depression but found that only tango reduced stress levels (Pinniger et al. 2012). In addition, pre/post increases in mindfulness were associated with being in the tango, but not the mindfulness, class. These two studies in which outcomes of physical activities matched those of the mindfulness conditions suggest the possibility that the physical exercise component of MMBI contributes much to the observed treatment effects.

Likewise, CBT is known to have potent treatment effects and is a component of MMBIs such as MBCT and MBRP. A randomized dismantling trial of MBCT for depressive remission found that relapse rates were equivalent across the three treatment arms of MBCT (46%), an active cognitive treatment (50%), and treatment-as-usual (53%), though when considering those with a history of severe childhood trauma, MBCT was associated with lower relapse rates (41%) than treatment-as-usual (65%) and cognitive treatment (54%) (Williams et al. 2014).

Taken together, studies indicate that components of MMBI that promote capacities such as attention and emotion regulation are effectively taught in MMBI, though these capacities can be evoked through other means, such as practice of breath-focused attention in non-meditation contexts, hatha yoga and other types of exercise, and CBT. Much of the work in isolating treatment components has used college students as participants, so implications for work with persons with symptoms of clinical severity are unclear.

Future directions for research and clinical practice

There is much attention to MM as potential psychotherapeutic tools. There is accumulating evidence that MMBI can increase mindfulness and well-being, and decrease psychological symptoms. However, the unanticipated results of dismantling trials suggest that the components of MMBI should be more carefully defined. Without successful dismantling trials there can be no definitive demonstration that the outcomes of MMBI are related to MM active intervention components and are not the result of common therapeutic factors. There are several directions for future research that might clarify the active ingredients of MMBI and lead to more effective deployment of these techniques in therapy.

One of the implications of taking a traditional or religious view of MM is that the techniques should be used *in toto*, rather than being extracted from their philosophical and religious underpinnings (Grossman and Van Dam 2011). Distinguishing explicitly clinical uses would aid in defining the active ingredients of MM and their match to the specific needs and capacities of persons with different sorts of health and mental health issues, in a manner that is grounded in theories of the disorder or condition and its treatment. An example is the way that DBT uses mindfulness as a set of self-monitoring skills to enhance emotion regulation in a way that is specific to the therapeutic needs of persons with borderline personality disorder (Linehan 1993). The growing evidence that different techniques are associated with different outcomes (Carmody and Baer 2008; Hölzel et al. 2011; Sauer-Zavala et al. 2012) could be deployed in very specific adaptations of MM techniques to particular disorders and conditions.

A sound understanding of how the different techniques work would allow for prescriptive uses or matching of clients to techniques. The clinical descriptive literature abounds in suggestions for ways to match techniques to therapist and client needs and preferences (e.g., Germer 2005; Waelde 2015). Distinguishing traditional and secular perspectives would also encourage recognition that diversity may make a difference in the acceptability and usefulness of MMBI. Diversity factors such as culture, religious affiliation, ethnicity, age, and gender have scarcely been addressed in research about MMBI, despite the fact that culture influences mechanisms of emotion regulation (Su et al. 2014) and thus diversity factors may influence mechanisms of MMBI.

Research should address the primary psychotherapeutic uses of MM, rather than making generalizations to clinical practice from studies of standardized stand-alone interventions. It is not unique to the meditation field that clinicians prefer flexibility and modularity in treatment over adherence to manualized interventions (Borntrager et al. 2009). Research has not yet adequately addressed what is perhaps the most commonly implemented form of MM in therapy: The use of breath-focused awareness and other MM techniques in individualized ways during the course of other types of therapy. It is concerning that informal practice in daily life, as perhaps the most common form of long-term practice (Miller et al. 1995), does not seem to be strongly related to outcomes (Carmody and Baer 2008). Because previous research has demonstrated that treatment outcomes are associated with the degree of practice of the techniques, intervention development and testing should attend to dosing effects. Psychotherapy process research methods (Ramseyer et al. 2014) may be brought to bear on the issue of how MM practice influences the course and outcomes of therapy.

An explicitly clinical orientation would not mean abandoning studies of spiritual and religious MM practice. It seems very likely that scientific investigation of MM mechanisms and outcomes among adepts or religious practitioners can yield useful information about the nature of the mind and the developmental trajectories of long-term practice. To this end, the practice of treating different meditation traditions in entirely separate literatures serves soteriological more than scientific purposes. Davis and Vago (2013) suggested operationalizing traditional constructs across many traditions into common psychological and neurocognitive terms. In this enterprise—which holds promise for increasing understanding of the mechanisms and trajectory of meditative attainment—we should not prematurely conflate terminology across traditions, though we may hope to avoid additional centuries of scholarly dispute about distinctions among traditions by using methods drawn from neuroscience, phenomenology, and cognitive and clinical science in these pursuits.

Personal Meditation Journeys

Lynn C. Waelde

I was in elementary school during a time when yoga began to be very popular in the United States. My first exposure to it was when I found books about yoga and meditation in our public library, but gaining access to the material was difficult. It was exciting for me to sneak into the adult side of the library and position myself in the stacks in such a way that the librarian couldn't see me. I had to be exceedingly careful as I moved from one row to another, because if she caught me I would be expelled and there would be no hope of reading anything interesting for the next several weeks. I dreaded the sound of her chair scraping the floor. How many times I hid with my heart pounding in my throat while she helped a patron find a book! Many a time she caught me and escorted me back to the children's side of the library, gesturing to a stack of books just two feet from the floor. My hope each visit was to escape detection until I found something good and added it to the family pile of books on the circulation desk. Even then I wasn't safe because she got adept at detecting my selections and would ask my father if such and such a book was one of ours. My father had no objection to me reading about these topics but he did have an objection to lying (and so wouldn't say that the book was one of *his*, for example) and, most importantly, he wanted me to defend my choices. I was often speechless in these interactions and watched with my face burning as she tossed my book into the return bin. If only all obstacles on the spiritual path were so easily overcome! I started at the top of the bookshelf containing the yoga and meditation books, intending to read my way down to the bottom over a series of visits. On the top shelf were books on tarot card reading, phrenology, palmistry, handwriting analysis, numerology, mental telepathy, witchcraft, voodoo, and even a book on Hippocratic humors. I found them engaging but decided they were not true. On the second shelf were yoga and meditation books. I found them much less easy to engage and didn't understand much of what I read, but decided that the essence of what I did understand was true.

While I was in college, I took meditation classes for years without knowing that I was doing so. I was a student of a yoga center in Baton Rouge, Louisiana where meditation sessions were euphemistically referred to as "breathing exercises." These were my very favorite part of the classes, which were otherwise agonizing because of the teacher's exacting technique, honed from years of training in India in a location she would not divulge, and my difficulties in overcoming years of incorrect, self-taught asana practice. I had started with such high hopes that hatha yoga would be easy for me! On my first visit, the teacher asked if I had ever taken yoga and I announced proudly that I had practiced

yoga and meditation for the past eight years. I still remember her unsmilingly raised eyebrows when I told her that I had taught myself from books. It was a searingly painful realization (physically and otherwise) that I actually knew nothing at all about yoga and meditation and was in fact at quite a disadvantage because I thought I knew much.

I didn't meet my meditation teacher, Sri Shambhavananda, until I was starting graduate school. In my guru I met a person who lives what he teaches; who established ashrams as places of practice and learning that are beautiful and provide the opportunity to do the hard work of developing spiritually. I am very fortunate to have the benefit of 25 years of his instruction. The meditation practice forms an inner discipline and structure that helps me weather all kinds of momentary and lasting difficulties. Because of my teacher, I have missed out on so much self-imposed suffering over the years, which has left room for so much happiness. The opportunity to share what I have gained in service to others is an ongoing creative process that gives my life tremendous meaning.

Jason M. Thompson

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Until I was ten years old, I believed in the God of Roman Catholicism. Every night, I knelt beside my bed and prayed. Sometimes I imagined what God would likely say in response to me. Then one night, I had an epiphany that the interlocutor of my confessional dialogues was not in fact God, but another part of me. The dissolution of my childhood faith felt like a loss of innocence, though, raising far more questions than it answered. For some time, book learning became my religion. Then, as an undergraduate studying English Literature at Oxford in the early 1990s, I encountered the anonymous fourteenth-century Christian mystic text *The Cloud of Unknowing*. "All rational beings, human and angelic, possess two faculties: The power of knowing and the power of loving," states the text's author. "To the first, to the intellect, God who made them is forever unknowable; but to the second, to love, God is completely knowable." I found this mystical conception of reality intriguing yet remote, especially when I left university and found myself 24 years old, single after my first long-term romantic relationship ended in a painful break-up, my parents divorced after years of emotional chaos.

I soon discovered that when trail running, mountaineering, or surfing, I experienced a flow state in which I felt a sense of unity with nature; the more intense my exertion, the more unity. In my late twenties, after moving to San Francisco, I became a regular student of a yoga teacher who taught a practice that combined physical intensity with an explicit message that the true purpose of yoga is *bhakti* (spiritual devotion). Lying on the floor in *savasana* at the end of class, I felt a sense of relaxation extend throughout my

body and mind. After class, I felt more interested in socializing with other students and more grateful to my teacher, and wondered if this was a novice glimpse of *bhakti*. I was eager to know how to maintain these warm feelings outside yoga class, but for several years I could only feel calm when I was pushing myself hard physically; often, the moment I left the yoga mat, my mind was busy again with worry or sadness or anger. I sought out harder *asanas* and bigger waves, erroneously perceiving athletic intensity as *bhakti*'s necessary condition. One day, I broke my board in 15-feet surf a quarter of a mile from shore, and barely made the swim back to the beach through a maelstrom of whitewater; my path of upping the athletic ante to achieve emotional balance had revealed its outer limit.

From finding calm in the outer chaos of ocean waves, in my mid-thirties, following the birth of my first child, I began to look for a more sustainable means of calming the turbulence of consciousness. I took a meditation class at San Francisco Zen Center, developed a daily *zazen* practice, participated in several one-day sittings, studied Zen's ethical precepts through weekly dialogues with a Zen priest, and pursued a Buddhist Studies course. I soon noticed how the waves of my awareness began to settle much more easily, even in difficult circumstances. I came to understand that self-care was coterminous with a compassionate commitment to alleviating the suffering of others: Zen's non-theistic version of the Christian idea of God's knowability through love alone. I then became fascinated with the emerging dialogue between the meditative traditions and modern science. I embarked on a Ph.D. in clinical psychology at Palo Alto University (PAU) in the hope that I could both deepen my theoretical enquiry and integrate my personal insights as a meditation practitioner with clinical skills grounded in scientific psychology. Given those aims, I was fortunate indeed to find a faculty advisor, Lynn Waelde, whose expertise so closely matched my interests. At PAU, I trained to apply Dr. Waelde's meditation intervention, Inner Resources, to a range of clinical and community needs. I then served as a research assistant on an NIH-funded fMRI meditation and hypnosis investigation of which Dr. Waelde is a co-investigator, data from which I analyzed in my dissertation, a neurophenomenological study of decentering in focused attention and open monitoring meditation. I learned how meditation creates patterns in neural network connectivity that support a more stable sense of selfhood, interdependent with other selves.

From Catholic prayer to *zazen*, perhaps I have come full circle from my boyhood self who prayed and wondered about the reality of his internal dialogue; I still notice my thoughts and ask if they are real. But that act of introspection is informed now by years of practice that has shown me the inner calm that emerges when I suspend the "power of knowing" and attend kindly to this moment, this breath.

References

Aggs, C. and Bambling, M. (2010). Teaching mindfulness to psychotherapists in clinical practice: The Mindful Therapy Programme. *Counselling and Psychotherapy Research*, **10**, 278–286. doi:10.1080/14733145.2010.485690

Arch, J. J. and Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy*, **44**, 1849–1858. doi:10.1016/j.brat.2005.12.007

Baer, R. A. (2011). Measuring mindfulness. *Contemporary Buddhism*, **12**, 241–261. doi:10.1080/14639947.2011.564842

Baer, R. A., Smith, G. T., Lykins, E. et al. (2008). Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*, **15**, 329–342. doi:10.1177/1073191107313003

Barnes, P. M., Bloom, B., and Nahin, R. L. (2008). Complementary and alternative medicine use among adults and children: United States, 2007. *National Health Statistics Reports*, *No. 12*. Hyattsville, MD: National Center for Health Statistics.

Beck, A. T. (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *The American Journal of Psychiatry*, **165**, 969–977. doi:10.1176/appi.ajp.2008.08050721

Bishop, S. R., Lau, M., Shapiro, S. et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice*, **11**, 230–241. doi:10.1093/clipsy.bph077

Black, D. S. (2014). Mindfulness-based interventions: An antidote to suffering in the context of substance use, misuse, and addiction. *Substance Use and Misuse*, **49**, 487–491. doi:10.3109/10826084.2014.860749

Bodhi, B. (2000). *A comprehensive manual of Abhidhamma*. Seattle, WA: BPS Pariyatti.

Bormann, J. E., Thorp, S. R., Wetherell, J. L. et al. (2013). Meditation-based mantram intervention for veterans with posttraumatic stress disorder: A randomized trial. *Psychological Trauma: Theory, Research, Practice, and Policy*, **5**, 259–267. doi:10.1037/a0027522

Borntrager, C. F., Chorpita, B. F., Higa-McMillan, C., and Weisz, J. R. (2009). Provider attitudes toward evidence-based practices: Are the concerns with the evidence or with the manuals? *Psychiatric Services (Washington, DC)*, **60**, 677–681. doi:10.1176/appi.ps.60.5.677

Bowen, S., Chawla, N., and Marlatt, G. A. (2011). *Mindfulness-based relapse prevention for addictive behaviors: A clinician's guide*. New York, NY: Guilford Press. Retrieved from https://paloaltou.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=trueanddb=psyhandAN=2011-01707-000

Braboszcz, C., Hahusseau, S., and Delorme, A. (2010). Meditation and neuroscience: From basic research to clinical practice. In R. Carlstedt (Ed.). *Integrative clinical psychology, psychiatry, and behavioral medicine: Perspectives, practices, and research*, pp. 755–778. New York, NY: Springer Publishing.

Brefczynski-Lewis, J. A., Lutz, A., Schaefer, H. S. et al. (2007). Neural correlates of attentional expertise in long-term meditation practitioners. *Proceedings of the National Academy of Sciences of the United States of America*, **104**(27), 11483–11488. doi:10.1073/pnas.0606552104

Butler, L. D., Waelde, L. C., Hastings, T. A. et al. (2008). Meditation with yoga, group therapy with hypnosis, and psychoeducation for long-term depressed mood: A randomized pilot trial. *Journal of Clinical Psychology*, **64**, 806–820. doi:10.1002/jclp.20496

Cahn, B. R. and Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, **132**, 180–211. doi:10.1037/0033-2909.132.2.180

Carmody, J. and Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*, **31**, 23–33. doi:10.1007/s10865-10007-9130-9137

Carmody, J., Baer, R. A., Lykins, E. L. B., and Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, **65**, 613–626. doi:10.1002/jclp.20579

Chiesa, A. (2013). The difficulty of defining mindfulness: Current thought and critical issues. *Mindfulness*, **4**, 255–268. doi:10.1007/s12671-012-01231-4

Chiesa, A., Serretti, A., and Jakobsen, J. C. (2013). Mindfulness: Top-down or bottom-up emotion regulation strategy? *Clinical Psychology Review*, **33**, 82–96. doi:10.1016/j.cpr.2012.10.006

Cloitre, M., Courtois, C. A., Carapezza, R. et al. (2011). Treatment of complex PTSD: Results of the ISTSS expert clinician survey on best practices. *Journal of Traumatic Stress*, **24**, 615–627. doi:10.1002/jts.20697

Cook, J. M., Biyanova, T., Elhai, J. et al. (2010). What do psychotherapists really do in practice? An Internet study of over 2,000 practitioners. *Psychotherapy Theory, Research, Practice, Training*, **47**, 260–267. doi:10.1037/a0019788

Critchley, H. D., Eccles, J., and Garfinkel, S. N. (2013). Interaction between cognition, emotion, and the autonomic nervous system. *Handbook of Clinical Neurology*, **117**, 59–77. doi:10.1016/B978-970-444-53491-0.00006-7

Damasio, A. R. (1996). The somatic marker hypothesis and the possible functions of the prefrontal cortex. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, **351**, 1413–1420. doi:10.1098/rstb.1996.0125

Dass, B. H. and Diffenbaugh, D. (2013). *The Yoga Sūtras of Patañjali: A study guide for Book III Vibhūti Pāda*. Santa Cruz, CA: Sri Rama Publishing.

Davis, J. H. and Vago, D. R. (2013). Can enlightenment be traced to specific neural correlates, cognition, or behavior? No, and (a qualified) yes. *Frontiers in Psychology*, **4**(870), 1–4. doi:10.3389/fpsyg.2013.00870

Desbordes, G., Gard, T., Hoge, E. A. et al. (2014). Moving beyond mindfulness: Defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness*, **6**(2), 356–372. doi:10.1007/s12671-013-02692-8

Dunn, R., Callahan, J. L., and Swift, J. K. (2013). Mindfulness as a transtheoretical clinical process. *Psychotherapy*, **50**, 312–315. doi:10.1037/a0032153

Dunne, J. (2011). Toward an understanding of non-dual mindfulness. *Contemporary Buddhism: An Interdisciplinary Journal*, **12**, 71–88. doi:10.1080/14639947.2011.564820

Eberth, J. and Sedlmeier, P. (2012). The effects of mindfulness meditation: A meta-analysis. *Mindfulness*, **3**, 174–189. doi:10.1007/s12671-012-0101-x

Farb, N. A. S., Segal, Z. V., and Anderson, A. K. (2013). Mindfulness meditation training alters cortical representations of interoceptive attention. *Social Cognitive and Affective Neuroscience*, **8**, 15–26. doi:10.1093/scan/nss066

Farb, N. A. S., Segal, Z. V., Mayberg, H. et al. (2007). Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience*, **2**, 313–322. doi:10.1093/scan/nsm030

Flood, G. (1996). *An introduction to Hinduism*. Cambridge, UK: Cambridge University Press.

Forstmann, M. and Burgmer, P. (2015). Adults are intuitive mind-body dualists. *Journal of Experimental Psychology*, **144**, 222–235.

Fresco, D. M., Segal, Z. V., Buis, T., and Kennedy, S. (2007). Relationship of posttreatment decentering and cognitive reactivity to relapse in major depression. *Journal of Consulting and Clinical Psychology*, **75**, 447–455. doi:10.1037/0022-006X.75.3.447

Fulton, P. R. (2005). Mindfulness as clinical training. In C. K. Germer, R. D. Siegel, and P. R. Fulton (Eds.). *Mindfulness and psychotherapy*, pp. 55–72. New York, NY: Guilford Press.

Galante, J., Galante, I., Bekkers, M.-J., and Gallacher, J. (2014). Effect of kindness-based meditation on health and well-being: A systematic review and meta-analysis. *Journal of Clinical and Consulting Psychology*, **82**, 1101–1114. doi:10.1037/a0037249

Germer, C. K. (2005). Teaching mindfulness in therapy. In C. K. Germer, R. D. Siegel, and P. R. Fulton (Eds.). *Mindfulness and psychotherapy*, pp. 113–129. New York, NY: Guilford Press.

Goyal, M., Singh, S., Sibinga, E. M. S. et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, **174**(3), 357–368. doi:10.1001/jamainternmed.2013.13018

Greene, C. J., Morland, L. A., Durkalski, V. L., and Frueh, B. C. (2008). Noninferiority and equivalence designs: Issues and implications for mental health research. *Journal of Traumatic Stress*, **21**, 433–439. doi:10.1002/jts.20367

Grepmair, L., Mitterlehner, F., Loew, T. et al. (2007). Promoting mindfulness in psychotherapists in training influences the treatment results of their patients: A randomized, double-blind, controlled study. *Psychotherapy and Psychosomatics*, **76**, 332–338. doi:10.1159/000107560

Grossman, P. and Van Dam, N. T. (2011). Mindfulness, by any other name . . . : Trials and tribulations of sati in western psychology and science. *Contemporary Buddhism*, **12**, 219–239. doi:10.1080/14639947.2011.564841

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, **35**, 639–665. doi:10.1016/S0005-7894(04)80013-13

Hayes, S. C. and Strosahl, K. D. (Eds.) (2010). *A practical guide to acceptance and commitment therapy*. New York, NY: Springer US.

Hechanova, M. R. M., Ramos, P. A. P., and Waelde, L. C. (2015). *Group-based mindfulness-informed psychological first aid after Typhoon Haiyan*. Manuscript submitted for publication.

Hölzel, B. K., Lazar, S. W., Gard, T. et al. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, **6**, 537–559. doi:10.1177/1745691611419671

Ivanovski, B. and Malhi, G. S. (2007). The psychological and neurophysiological concomitants of mindfulness forms of meditation. *Acta Neuropsychiatrica*, **19**, 76–91. doi:10.1111/j.1601–5215.2007.00175.x

Jazaieri, H., Goldin, P. R., Werner, K. et al. (2012). A randomized trial of MBSR versus aerobic exercise for social anxiety disorder. *Journal of Clinical Psychology*, **68**, 715–731. doi:10.1002/jclp.21863

Johnson, S., Gur, R. M., David, Z., and Currier, E. (2013). One-session mindfulness meditation: A randomized controlled study of effects on cognition and mood. *Mindfulness*, **6**, 88–98. doi:10.1007/s12671-013-02342-6

Josefsson, T., Lindwall, M., and Archer, T. (2014). Physical exercise intervention in depressive disorders: Meta-analysis and systematic review. *Scandinavian Journal of Medicine and Science in Sports*, **24**, 259–272. doi:10.1111/sms.12050

Josipovic, Z. (2010). Duality and nonduality in meditation research. *Consciousness and Cognition*, **19**, 1119–1121. doi:10.1016/j.concog.2010.03.016

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, **10**, 144–156. doi:10.1093/clipsy.bpg016

Kabat-Zinn, J. (2005). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness. Fifteenth anniversary edition*. New York, NY: Delta Trade Paperback/Bantam Dell.

Kang, D. H., Jo, H. J., Jung, W. H. et al. (2013). The effect of meditation on brain structure: Cortical thickness mapping and diffusion tensor imaging. *Social Cognitive and Affective Neuroscience*, **8**, 27–33. doi:10.1093/scan/nss056

Kasala, E. R., Bodduluru, L. N., Maneti, Y., and Thipparaboina, R. (2014). Effect of meditation on neurophysiological changes in stress mediated depression. *Complementary Therapies in Clinical Practice*. doi:10.1016/j.ctcp.2013.10.001

Khoury, B., Lecomte, T., Fortin, G. et al. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, **33**, 763–771. doi:10.1016/j.cpr.2013.05.005

Kilpatrick, L. A., Suyenobu, B. Y., Smith, S. R. et al. (2011). Impact of mindfulness-based stress reduction training on intrinsic brain connectivity. *NeuroImage*, **56**, 290–298. doi:10.1016/j.neuroimage.2011.02.034

Kristeller, J. L. and Rikhye, K. (2008). Meditative traditions and contemporary psychology. In K. R. Rao, A. C.Pararipe, and A. K. Dalai (Eds.). *Handbook of Indian psychology*, pp. 506–538. New Delhi, India: Cambridge University Press.

Kumar, U., Guleria, A., Sri, S. et al. (2014). Effect of SOHAM meditation on human brain: A voxel-based morphometry study. *Journal of Neuroimaging*, **24**, 187–190. doi:10.1111/jon.12040

Lee, E. O. and Yeo, Y. (2013). Relaxation practice in the United States: Findings from the National Health Interview Survey. *Journal of Holistic Nursing*, **31**, 139–148. doi:10.1177/0898010113477253

Leung, M. K., Chan, C. C. H., Yin, J. et al. (2013). Increased gray matter volume in the right angular and posterior parahippocampal gyri in loving-kindness meditators. *Social Cognitive and Affective Neuroscience*, **8**, 34–39. doi:10.1093/scan/nss076

Lindahl, J. R. (2014). Why right mindfulness might not be right for mindfulness. *Mindfulness*, **6**, 57–62. doi:10.1007/s12671-014-03803-5

Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder*. New York, NY: Guilford Press.

Lutz, A., Brefczynski-Lewis, J., Johnstone, T., and Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PLoS ONE*, **3**(3), e1897. doi:10.1371/journal.pone.0001897

Lutz, A., McFarlin, D. R., Perlman, D. M. et al. (2013). Altered anterior insula activation during anticipation and experience of painful stimuli in expert meditators. *NeuroImage*, **64**, 538–546. doi:10.1016/j.neuroimage.2012.09.030

Miller, J. J., Fletcher, K., and Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, **17**(3), 192–200. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/7649463

Nash, J. D. and Newberg, A. (2013). Toward a unifying taxonomy and definition for meditation. *Frontiers in Psychology*, **4**(806), 1–18. doi:10.3389/fpsyg.2013.00806

Orme-Johnson, D. W. and Barnes, V. A. (2014). Effects of the transcendental meditation technique on trait anxiety: A meta-analysis of randomized controlled trials. *Journal of Alternative and Complementary Medicine*, **20**, 330–341. doi:10.1089/acm.2013.0204

Orme-Johnson, D. W., Schneider, R. H., Son, Y. D. et al. (2006). Neuroimaging of meditation's effect on brain reactivity to pain. *Neuroreport*, **17**(12), 1359–1363. doi:10.1097/01.wnr.0000233094.67289.a8

Ospina, M. B., Bond, K., Karkhaneh, M. et al. (2007). *Meditation practices for health: State of the research*. Rockville, MD: Agency for Healthcare Research and Quality.

Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. Oxford, UK: Oxford University Press.

Pinniger, R., Brown, R. F., Thorsteinsson, E. B., and Mckinley, P. (2012). Argentine tango dance compared to mindfulness meditation and a waiting-list control: A randomised trial for treating depression. *Complementary Therapies in Medicine*, **20**, 377–384. doi:10.1016/j.ctim.2012.07.003

Pollak, S. M., Pedulla, T., and Siegel, R. D. (2014). *Sitting together: Essential skills for mindfulness-based psychotherapy*. New York, NY: Guilford Press.

Purser, R. E. (2015). Clearing the muddled path of traditional and contemporary mindfulness: A response to Monteiro, Musten, and Compson. *Mindfulness*, **6**, 23–45. doi:10.1007/s12671-014-03733-4

Ramseyer, F., Kupper, Z., Caspar, F. et al. (2014). Time-series panel analysis (TSPA): Multivariate modeling of temporal associations in psychotherapy process. *Journal of Consulting and Clinical Psychology*, **82**, 828–838.

Sauer-Zavala, S. E., Walsh, E. C., Eisenlohr-Moul, T. A., and Lykins, E. L. B. (2012). Comparing mindfulness-based intervention strategies: Differential effects of sitting meditation, body scan, and mindful yoga. *Mindfulness*, **4**, 383–388. doi:10.1007/s12671-012-01391-9

Sedlmeier, P., Eberth, J., Schwarz, M. et al. (2012). The psychological effects of meditation: A meta-analysis. *Psychological Bulletin*, **138**, 1139–1171. doi:10.1037/a0028168

Segal, Z. V., Williams, J. M. G., and Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press.

Strauss, C., Cavanagh, K., Oliver, A., and Pettman, D. (2014). Mindfulness-based interventions for people diagnosed with a current episode of an anxiety or depressive disorder: A meta-analysis of randomised controlled trials. *PloS One*, **9**(4), e96110. doi:10.1371/journal.pone.0096110

Su, J. C., Wei, M., and Tsai, H.-T. (2014). Running away from unwanted feelings: Culture matters. *Cognition and Emotion*, **28**, 1313–1327. doi:10.1080/02699931.2014.881322

Tang, Y.-Y., Lu, Q., Fan, M. et al. (2012). Mechanisms of white matter changes induced by meditation. *Proceedings of the National Academy of Sciences of the United States of America*, **109**, 10570–10574. doi:10.1073/pnas.1207817109

Tanner, M. A., Travis, F., Gaylord-King, C. et al. (2009). The effects of the transcendental meditation program on mindfulness. *Journal of Clinical Psychology*, **65**, 574–589. doi:10.1002/jclp.20544

Travis, F. and Pearson, C. (2000). Pure consciousness: Distinct phenomenological and physiological correlates of "consciousness itself." *International Journal of Neuroscience*, **100**, 77–89. doi:10.3109/00207450008999678

Travis, F. and Shear, J. (2010a). Focused attention, open monitoring and automatic self-transcending: Categories to organize meditations from Vedic, Buddhist and Chinese traditions. *Consciousness and Cognition*, **19**, 1110–1118. doi:10.1016/j.concog.2010.01.007

Travis, F. and Shear, J. (2010b). Reply to Josipovic: Duality and non-duality in meditation research. *Consciousness and Cognition*, **19**, 1122–1123. doi:10.1016/j.concog.2010.04.003

VA Office of Research and Development (2011). *PTSD and complementary alternative medicine—Research opportunities*. Retrieved from http://www.research.va.gov/news/research_highlights/ptsd-cam-051711.cfm

Van Diest, I., Verstappen, K., Aubert, A. E. et al. (2014). Inhalation/exhalation ratio modulates the effect of slow breathing on heart rate variability and relaxation. *Applied Psychophysiology and Biofeedback*, **39**, 171–180. doi:10.1007/s10484-014-9253-x

Van Gordon, W., Shonin, E., Griffiths, M. D., and Singh, N. N. (2015). There is only one mindfulness: Why science and Buddhism need to work together. *Mindfulness*, **6**, 49–56. doi:10.1007/s12671-014-0379-y

Waelde, L. C. (2015). Mindfulness and meditation for trauma-related dissociation. In V. Follette, J. Briere, J. Hopper, D. Rozelle, and D. Rome (Eds.). *Contemplative methods in trauma treatment: Integrating mindfulness and other approaches*, pp. 301–313. New York, NY: Guilford Press.

Waelde, L. C., Thompson, L., and Gallagher-Thompson, D. (2004). A pilot study of a yoga and meditation intervention for dementia caregiver stress. *Journal of Clinical Psychology*, **60**, 677–687. doi:10.1002/jclp.10259

Waelde, L. C., Thompson, J. M., Robinson, A., and Iwanicki, S. (in press). Trauma therapists' clinical applications, training, and personal practice of mindfulness and meditation. *Mindfulness*.

Waelde, L. C., Uddo, M., Marquett, R. et al. (2008). A pilot study of meditation for mental health workers following Hurricane Katrina. *Journal of Traumatic Stress*, **21**, 497–500. doi:10.1002/jts.20365

Walsh, R. and Shapiro, S. L. (2006). The meeting of meditative disciplines and Western psychology: A mutually enriching dialogue. *The American Psychologist*, **61**, 227–239. doi:10.1037/0003-066X.61.3.227

Walshe, M. (1987). *The long discourses of the Buddha: A translation of the Dīgha Nikāya*. Somerville, MA: Wisdom Publications.

Weiss, M., Nordlie, J. W., and Siegel, E. P. (2005). Mindfulness-based stress reduction as an adjunct to outpatient psychotherapy. *Psychotherapy and Psychosomatics*, **74**, 108–112. doi:10.1159/000083169

Williams, J. M. G., Crane, C., Barnhofer, T. et al. (2014). Mindfulness-based cognitive therapy for preventing relapse in recurrent depression: A randomized dismantling trial. *Journal of Consulting and Clinical Psychology*, **82**, 275–286. doi:10.1037/a0035036

Williams, P. (2000). *Buddhist thought: A complete introduction to the Indian tradition*. Abingdon, UK: Routledge.

Williams, P. (2009). *Mahāyāna Buddhism: The doctrinal foundations*. Abingdon, UK: Routledge.

Zeidan, F., Grant, J. A., Brown, C. A. et al. (2012). Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain. *Neuroscience Letters*, **520**, 165–173. doi:10.1016/j.neulet.2012.03.082

Zeidan, F., Johnson, S. K., Gordon, N. S., and Goolkasian, P. (2010). Effects of brief and sham mindfulness meditation on mood and cardiovascular variables. *Journal of Alternative and Complementary Medicine*, **16**, 867–873. doi:10.1089/acm.2009.0321

Chapter 7

Meditation and the management of pain

Vidyamala Burch

Introduction

Nobody likes to suffer. When we experience pain, we don't like it. When we haven't cultivated skills in mental and emotional training, we automatically add mental, emotional, and physical reactions of "not wanting" onto the sensations of pain, creating an experience of resistance. We then have painful sensations + resistance = increased suffering. Our *reactions* to the unpleasant experience of pain mean that our overall suffering intensifies.

Meditation—both mindfulness and compassion approaches—is the training ground for the mind and heart. Awareness has a crucial role to play in reducing this automatic reaction. The basic sensations of pain may be unavoidable for individuals living with health problems that cause physical pain, but the *reaction* is optional. It is possible to train the mind with meditation so that pain is experienced on the level of unpleasant physical sensation alone, free from additional mental and emotional suffering.

I know this from first-hand experience. My whole adult life has been engaged with the mystery of living with chronic pain after spinal injuries in my teens. Alongside this has been a deep longing for inner peace based on intuitions that it is possible to experience the human condition in ways that transcend struggle. It has been a grueling and intense life journey that has taken me to great depths and heights of experience. It has also been profoundly satisfying, even if it is not a life journey I would ever have chosen.

In this chapter I will explore the underlying physiology of physical pain and the different ways it manifests; the immense burden pain places on both individuals and society; and how meditation and mind/heart training can help to manage reactions to pain and thus transform quality of life; and I will offer an overview of the research into meditation for pain. Finally I will introduce the specific approach I have developed at Breathworks with mindfulness-based pain management (MBPM) and the Buddhist roots that underlie the Breathworks Program.

What is pain?

Until fairly recently, the prevailing view was that pain is a result of damage to the body. In the seventeenth century the French philosopher René Descartes developed a "rope-pull" model of pain. Just as pulling a rope in a church tower rings the bell, Descartes thought that tissue damage in the body is a tug that causes the sensation of pain in the brain. Following Descartes, for centuries Western doctors regarded pain as a sensation that could be explained by neurology. The intensity of the pain was thought to be directly proportional to the degree of damage to the body, which would mean that if different people had the same injury they would experience the same pain. If no obvious physical cause could be found, often the patient would be accused of malingering.

However, in the last half-century views of pain have changed dramatically as scientists discovered the extent to which it involves the whole person—the mind as well as the body—and research using modern neuroimaging methods showed how complex pain is. The leading professional body of pain specialists, the International Association for the Study of Pain (IASP), defines pain as: "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or which is described in terms of such damage." They add that "pain is always subjective" (International Association for the Study of Pain 1994, p. 210). The key point is that pain is an *experience* and emotions, beliefs, and attitudes, as well as past experiences, all play a role in how the experience we label "pain" is perceived (Bond and Simpson 2006, p. 4).

Why do we experience pain?

Acute pain is part of our evolutionary heritage. It is an essential part of our survival apparatus. It is the pain experienced in the short term following an injury. If you stub a toe or touch something hot, you feel an acute pain that is a direct consequence of a pain signal sent to the brain from the injured muscles, bones, ligaments, or skin. This pain is part of the body's inbuilt alarm system, signaling that it is under attack and that there is a need to take care of the injured area to allow it to heal. Inflammation will probably be evident, such as a bruise, swelling, or blister, and pain will be felt at the site of the injury. Following an injury, chemical and physical responses in the affected cells and tissues begin healing the damage. Most healing is completed within six weeks and acute pain usually reduces over this period, while nearly all injured tissues are fully healed within six months. Acute pain also arises without obvious injury, as with a stomachache after overeating, or the headache that comes with a hangover. People who do not experience pain to warn them of damage—a condition called "congenital insensitivity to pain"—suffer repeated injuries and, very often, reduced life expectancy.

Chronic pain, also called *persistent* or *long-term pain*, is pain that has lasted for three months or more (Cole et al. 2005, p. 37)—sometimes it can continue for decades. Chronic pain can develop after an injury and persist, often inexplicably, after tissue healing has taken place. Or it may start for no obvious or specific reason. If the pain remains even when there is no continuing physical damage, the experience of pain becomes a medical problem in its own right and is often referred to as "chronic pain syndrome."

Chronic pain is complex and multi-faceted, involving physical, emotional, and mental reactions (see Wall 1999). Some pain is caused by obvious tissue damage that persists over time—for example, in the case of arthritis and cancer. This pain is caused by continuing physical processes at the area of disease or joint degeneration and there is a clear cause of the aversive sensations.

Neuropathic pain occurs in the nervous system rather than being prompted by tissue damage and can be confusing—often medical investigations reveal no obvious cause. Some neuropathic pain is caused by damage or injury to the nerves, the spinal cord, or the brain, but sometimes pain is felt even when there is no damage, or healing has finished at the site of the injury. The latest research suggests that the nervous system responds to the experience of pain by increasing its capacity to process pain signals, rather as a computer devotes extra circuits and memory to an important task. The central nervous system can then become over-sensitized so that a little pain feels far worse. The nervous system can act as an amplifier of pain sensations, such that when one develops chronic pain it is as if the amplifier has been turned up.

Neuropathic pain can also take the form of unusual sensations, such as electric shocks, the sensation of water or burning on the skin, or distorted perceptions of the body. Another example of neuropathic pain is phantom limb pain, when pain persists in a limb after it has been amputated. In each case, the sensation of pain is produced by nerves that have been damaged or whose signals have become confused in some way, so that neuropathic pain is an electrical rather than a mechanical fault.

Chronic and neuropathic pain offer no evolutionary advantage and arise through dysfunction of the nervous system. Such pain can be compared to useless "white noise" that is constantly present in the background; like being trapped in a room with a radio that is tuned off the station and produces constant hissing, crackling, and humming.

Recent studies show how the experience of pain is very complex and individual. We might assume, for example, that if a person has back pain then detailed MRI scans would allow us to see the cause of the problem. In fact, in a study where a number of people *without* back pain were scanned, 64% had disc abnormalities in the spine (Jensen 1994) while in another study of people *with* back

pain, 85% had no obvious damage (Fordyce et al. 1984; Gamsa 1994). Research also shows huge individual variation in pain perception. Two individuals given the same pain stimulus while being monitored in the scanner can show vastly different brain activity (Wall 1999, p. 78).

One well-established view of pain is the "gate control theory" developed in the 1960s by Patrick Wall—a neuroscientist who specialized in studying pain—and his collaborator Ronald Melzack (Wall and Melzack 1982, p. 98). They suggested that there are "gates" in the nerve junctions, spinal cord, and the brain's pain centers. For pain to be experienced, these gates need to be opened and this is what happens when a healthy person is injured. Pain messages are a signal to protect that part of the body that helps it to heal. The gates can also close, which means pain is reduced or stopped. Again, this is what happens in the case of a healthy person when healing is complete.

Opening and closing these gates is a complex process that is affected by emotional states, mental activity, and where attention is focused. Whether the brain expects pain or is primed to detect any damage or strain also has an impact. Then the pain pathways (or gates) open so the brain doesn't miss anything—and the pain experience is amplified. People with chronic pain commonly report that they manage some pain effectively, but a sudden, unexpected increase in pain feels much worse because of the fear that it is caused by new damage. The anxiety causes the gates to open or to stay open longer.

Researchers are searching for ways to close the gates in people living with chronic pain so that their nervous systems can return to normal functioning. Mindfulness training and meditation may be one way to do this because it calms mental, physical, emotional, and nervous systems, allowing them to return to a state of balance. The view of pain emerging from this research includes the mind, the body, and the environment. As Wall (1999, p. 31) writes:

> Pure pain is never detected as an isolated sensation. Pain is always accompanied by emotion and meaning so that each pain is unique to the individual. The word "pain" is used to group together a class of combined sensory-emotional events. The class contains many different types of pain, each of which is a personal, unique experience for the person who suffers.

This growing awareness of the complexity of pain shows that treating it involves the whole of a person's experience. The *bio-psychosocial* model of pain, widely used in chronic pain management, suggests that the biological, psychological, and social aspects of an individual's life all influence the way that person deals with pain. This has led to the development of multi-faceted pain management programs—intensive courses, often run in hospitals, which offer in-depth help in managing the many ways in which pain has affected a person's life, drawing on psychology, occupational therapy, and physiotherapy, as well as advice from doctors.

Mindfulness-based pain management (MBPM), as developed at Breathworks (www.breathworks-mindfulness.org.uk) in the UK, is one such program. It combines a scientific view of pain with an understanding of the nature of experience that comes from the practice of meditation and mindfulness. These practices have ancient roots in the Buddhist tradition and they augment scientific understanding in practical ways by offering methods of learning to respond constructively to pain.

Why does a deeper understanding of pain matter? A modern epidemic

Advances in acute medical care are obviously welcome. However, many diseases that used to be fatal are now treatable, leaving people with long-term health conditions and pain to contend with. Consequently, chronic pain is increasingly common and can have a major impact on individuals and their families; it also exerts a major burden on health care services and on society as a whole.

On average, around one in five people in the developed world now suffers from chronic pain and a recent survey in the UK reported that 31% of men and 37% of women experience chronic pain (Health Survey for England 2011). This equates to around 20 million people in the UK, with 7.8 million of them suffering moderate to severe pain that has lasted for more than six months. The prevalence of chronic pain also increases with age, from 14% of men and 18% of women aged 16–34, to 53% of men and 59% of women aged 75 and over. In 2004, primary care management of patients with chronic pain in the UK was estimated to account for 4.6 million appointments per year; this is equivalent to 793 whole-time GPs at a cost of approximately £69 million (Belsey 2002). Figures are similar in the USA with some 116 million people suffering chronic pain, causing estimated costs of $635 billion a year, which is more than the yearly costs for cancer, heart disease, and diabetes (Gaskin and Richard 2012).

People with chronic pain not only suffer with physical pain itself but frequently have co-morbidities to manage, such as depression, anxiety, physical dysfunction, and social isolation, which can make pain management even more complex (Royal College of General Practitioners 2013). A recent meta-ethnography investigating patients' experiences of chronic pain revealed a number of key themes:

◆ 16% of sufferers feel their chronic pain is so bad that they sometimes want to die (Donaldson 2008, p. 37).

◆ 49% of patients with chronic pain experience depression (Donaldson 2008, p. 34).

- The overall quality of life for people with chronic pain is very poor; the average life score was 0.4, where 1 is perfect health (National Pain Audit 2010–2012, quoted in Royal College of General Practitioners 2013, p. 6).

- The average mental well-being score for men and women with severely limiting chronic pain was at a similar level to that of the lowest-scoring 10% of people who were pain free (Health Survey for England 2011).

- Sufferers were more likely to be anxious or depressed; 69% of people with severe pain reported one of these compared with 17% (anxious) and 22% (depressed) respectively among those with no chronic pain (Health Survey for England 2011).

- 25% of pain sufferers lose their jobs (Donaldson 2008, p. 34).

With obesity and sedentary lifestyles becoming more prevalent, the problem of chronic pain will only increase as a result of the associated physical strains and dysfunctions. Add in an ageing population and it is no surprise that chronic pain is sometimes referred to as a silent epidemic.

In the UK, in recognition of the burden of pain to the NHS, it was announced in Parliament on February 1, 2012, that chronic pain should be viewed as a long-term condition (LTC). Historically, pain was viewed only as a symptom of other diseases, rather than as a condition in its own right, so defining pain as a LTC constitutes a major shift in how chronic pain is managed by the NHS.

How meditation can help

Meditation as a means of training the mind and heart away from reactivity and toward peace and equanimity can play a major role in responding to this epidemic. It is low cost to the health care provider and enables the individual to self-manage their condition, using other health care interventions as required. For these reasons researchers and policy makers are beginning to discuss meditation and mindfulness as key public health initiatives in the management of pain.

In order for a new paradigm to make its way into the Western scientific mindset, there is a need for a robust evidence base. Over the last 40 years this evidence base has been slowly developing, with an explosion of interest in mindfulness over the last decade. In 2014, the Mindfulness All Party Parliamentary Group (MAPPG) in the UK reviewed the evidence base in preparation for writing the *Mindful Nation UK* report for publication in 2015 (Mindfulness All Party Parliamentary Group 2015). The first draft recommends:

> Mindfulness training is a valuable complement to conventional medical care. It is a form of "participatory medicine" by which the patient is enabled to develop their own understanding of their condition and draw upon their own resources for healing and

care, often within peer-to-peer groups. This is a new model of healthcare which it is widely believed will be increasingly significant in the future, as healthcare needs continue to grow. There is good evidence that MBIs [Mindfulness Based Intervention] can help reduce symptoms of depression and anxiety for people living with long-term conditions such as vascular disorders, chronic pain and cancer, and promising evidence is emerging for the helpfulness of MBIs for other long-term physical health conditions.

Review of research into meditation for pain management

Some of the first quantitative papers published on the medical benefits of mindfulness concerned a cohort of 51 chronic pain patients who enrolled in a ten-week mindfulness meditation training program (Kabat-Zinn 1982). The dominant pain categories were lower back, neck and shoulder, and headache pain. These were patients who had not improved with traditional medical care. At ten weeks, 65% of the patients showed a reduction of greater than or equal to 33% in the mean total Pain Rating Index, and 50% showed a reduction of greater than or equal to 50%. Similar decreases were recorded on other pain indices and in the number of medical symptoms reported. Large and significant reductions in mood disturbance and psychiatric symptomatology accompanied these changes and were relatively stable on follow-up. Two years later a similar study was published (Kabat-Zinn et al. 1985), which showed statistically significant reductions in measures of present-moment pain, negative body image, inhibition of activity by pain, symptoms, mood disturbance, and psychological symptomatology, including anxiety and depression. Pain-related drug utilization decreased and activity levels and feelings of self-esteem increased. At follow-up, the improvements observed during the meditation training were maintained up to 15 months post-meditation training for all measures except present-moment pain. The majority of subjects reported continued high compliance with the meditation practice as part of their daily lives. However, these were not randomized clinical trials, but rather observational studies, and we therefore do not know how much of the improvement was part of the natural course of illness and wellness.

These early studies looking into the role meditation can play in pain management provided tantalizing evidence that benefit could be gained. Since then there has been an explosion of interest in mindfulness research generally, including studies related to chronic pain. However, there is a need for more high-quality research in this emerging field.

In 2010, Arthritis Research UK conducted a literature review looking specifically at meditation for chronic pain. The report reviewed 91 pieces of evidence, including

evidence summaries, systematic reviews, and primary research. The paper concluded that: "this report identifies the lack of high quality clinical trial evidence . . . in establishing the effectiveness and underlying psychological processes of mindfulness-based interventions in the context of chronic musculoskeletal pain" (Arthritis Research UK 2010). The report also identified a lack of consensus regarding definitions, components, and processes of mindfulness meditation and the need for future research to include systematic reviews of meditation for chronic pain.

In 2013 a major systematic review and meta-analysis was conducted into meditation programs for psychological stress and well-being, which included reviewing the effectiveness of meditation for pain (Goyal et al. 2014). Meditation techniques were defined as those emphasizing mindfulness, concentration, and automatic self-transcendence. After reviewing 18,753 citations, the researchers found 47 trials to match their research criteria of randomized clinical trials with active controls for placebo effects through November 2012 from MEDLINE, PsycINFO, EMBASE, PsycArticles, Scopus, CINAHL, AMED, the Cochrane Library, and hand searches. The review reported that "The strength of evidence is moderate that mindfulness meditation programs have a small improvement in pain severity among a variety of populations when compared with a nonspecific active control" (Goyal et al. 2014, p. 119). Other findings in this review included moderate evidence of improved anxiety (effect size, 0.38 [95% CI, 0.12–0.64] at 8 weeks and 0.22 [0.02–0.43] at 3–6 months) and depression (0.30 [0.00–0.59] at 8 weeks and 0.23 [0.05–0.42] at 3–6 months).

As research into meditation for chronic pain develops, researchers are attempting to tease apart the many variables and gain a clearer understanding of how meditation can provide relief to pain sufferers. This includes gaining a deeper understanding of the role that different meditation practices have to play. In general there are two main types of meditation, drawn from Buddhism, that are utilized within meditation programs for pain. These are described as:

1 *Attention control* (Sedlmeier et al. 2012)—In the scientific literature this is most commonly described as *focused awareness (FA)* (also known as *shamatha* in the Buddhist tradition, concentration, and attentional balance (Wallace and Shapiro 2006)). These skills have been identified as basic attentional processes and, along with training the stability and flexibility of one's attention, the FA practitioner likely engages in cognitive reappraisal by repeatedly reinterpreting distracting events as fleeting or momentary, and doing so with acceptance (Zeidan et al. 2012).

2 *A shift in perspective*—Applied when meditation is used to help people shift the perspective from which they view their subjective experience. This is described as *open monitoring (OM)* (also referred to as *vipashyana* in the

Buddhist tradition, or decentering (Safran and Segal 1990), cognitive diffusion (Hayes et al. 1999), deautomization (Deikman 1966), and cognitive balance (Wallace and Shapiro 2006)). Some people also use the word mindfulness itself as a term to specifically describe OM approaches to awareness training. As Sedlmeier and colleagues point out in Chapter 13 of this volume, there is a need to establish consistent nomenclature across the field in order to reduce confusion. While practicing OM, the practitioner experiences the current sensory or cognitive "event" without evaluation, interpretation, or preference. This is sometimes referred to as "non-judgmental" awareness. Zen meditation is considered to be one form of OM practice (Austin 1999, p. 844).

Zeidan et al. (2012) examined a range of studies into mindfulness for pain and concluded that the OM style of meditation is more effective at reducing pain after extensive meditation training, as compared to FA. Support for this can be found in Grant and Rainville (2009), which reports that the analgesic effect in advanced meditators, performing an OM-style of attention, did not arise until around 2000 hours of practice. On the other hand, approaches combining elements of both FA and OM are effective at reducing behavioral and neural mechanisms of pain after brief mental training (Zeidan et al. 2010, 2011). These findings suggest that cognitive practices employing attentional stability (focused attention) in conjunction with non-evaluative awareness of sensory events (open monitoring) can reduce pain, even after brief mental training.

In addition to examining the different meditation types that lead to pain reduction, researchers are increasingly using neuroimaging in order to attempt to understand the different neural mechanisms involved. These studies complement the traditional use of self-report questionnaires that the early mindfulness studies relied on. Although the field is very much in its infancy and many questions remain unanswered, some studies assessing the anticipation and experience of acute experimental pain converge to show reduced pain anticipation in meditators associated with increased activation of brain regions implicated in cognitive/emotional control (rostral anterior cingulate cortex (rACC) and ventromedial-prefrontal cortex (vmPFC) (Brown and Jones 2010; Gard et al. 2011)). Brown and Jones (2010) postulated that cultivating an attitude of acceptance toward impending stimuli produces this increased cognitive and emotional control through increased cognitive flexibility. The anticipation or expectation reductions were postulated to be some of the active mechanisms of meditation-related pain relief (Gard et al. 2011).

Gard et al. (2011) also reported that pain can be modulated by mindfulness. A group of mindfulness practitioners and control participants underwent an

MRI scan during which they received unpleasant electrical stimuli during a mindfulness and a control condition. The researchers found that mindfulness practitioners, but not controls, were able to reduce pain unpleasantness by 22% and anticipatory anxiety by 29% during a mindful state. In the brain, this reduction was associated with decreased activation in the lateral prefrontal cortex and increased activation in the right posterior insula during stimulation and increased rACC activation during the anticipation of pain. The rACC is associated with the cognitive modulation of pain, cognitive control, and the regulation of emotions (Ochsner and Gross 2005; Vogt 2005).

Brown and Jones (2013) conducted EEG studies, along with self-report questionnaires, in participants on the Breathworks Mindfulness-Based Pain Management (MBPM) Program, again looking at the effect of mindfulness on pain anticipation using experimentally induced pain stimuli. Twenty-eight patients with chronic pain were assessed and randomized into an intervention group (who attended an eight-week MBPM) or a control group (treatment-as-usual), before being reassessed after eight weeks. Outcome measures included clinical pain, perceived control over pain, mental and physical health, and mindfulness. Neural activity was measured during the anticipation and experience of acute experimental pain, using electroencephalography with source reconstruction. Improvements were found in the MBPM group relative to the control group in mental health, which related to greater perceived control of pain, but not to reductions in clinical or experimental pain ratings. Anticipatory and pain-evoked event-related potentials to acute experimental pain were decreased, but sources of these event-related potentials were estimated to be in regions that modulate emotional responses rather than pain intensity. This study raises interesting questions about the role that emotions can play in the suffering associated with pain, given the participants experienced improved mental health and greater perceived control over pain, even though the actual pain intensity did not reduce to a significant degree. This study is also interesting in that the individuals participating in the study were those who lived with chronic pain, rather than healthy volunteers. The researchers concluded:

> The study supports the hypothesis that mindfulness training provides a cognitive strategy for improving pain management, which has positive consequences for mental health. Our results show that this is related to maintaining activity in central executive regions responsible for emotional regulation (DLPFC) during anticipation of pain, whereas reductions in processing during pain experience were modest and restricted to regions that are known to mediate emotional responses to pain including the amygdala and anterior insula (Brown and Jones 2013, p. 243).

Although research into mindfulness for chronic pain is commanding increasing interest, Zeidan et al.'s (2012) review looking at unique brain mechanisms

observes that some of the studies appear to contradict each other, showing the need to emphasize the importance of acknowledging differences in dependent measures (fMRI vs. EEG), meditation traditions, meditator experience level, and experimental directives. Clearly, more work is necessary to understand these discrepancies (Zeidan et al. 2012, p. 168). Overall, Zeidan et al. (2012, p. 170) concluded:

> In this review we have surveyed the rapidly emerging field of meditation-related pain reduction. The data indicate that, like other cognitive factors that modulate pain, prefrontal and cingulate cortices are intimately involved in the modulation of pain by mindfulness meditation. Mindfulness meditation, like other cognitive manipulations, alters the contextual evaluation of pain but is likely to do so dynamically over time and experience, such that beginners reappraise events and the most advanced practitioners may refrain from elaboration/appraisal entirely. Admittedly, many of these interpretations are based on reverse inference and assumptions derived from traditional claims and require more scrutiny in future research. Nonetheless, mindfulness-related pain reduction promises to be an important tool for understanding how our awareness of sensory events occurs as well as a potentially important adjunct to current treatment options for acute and chronic pain.

For more on the evidence base of MBIs for chronic pain, see Carlson in Chapter 9 of this volume.

The Breathworks Program (MBPM)

When I first decided to design a program to help others living with chronic pain and long-term health conditions, I turned to mindfulness-based stress reduction (MBSR) for inspiration before making adaptations drawn from my own experience and meditation training, as well as the field of pain management. Central to the program is the understanding that human beings have the capacity to be objective about mental, emotional, and physical experiences. This allows a perceptual shift from over-identification with passing experience to having perspective on what is happening. With a realistic appraisal of thoughts, emotions, and bodily sensations as they are perceived in the present moment, a move from a passive, reactive mode of behavior to one that is infused with initiative and choice can be made. The research noted in the previous section bears out the value of such a shift with evidence of greater emotional regulation in response to pain.

The key components of Breathworks MBPM are:

1 **Meditation**. Over the course of eight weeks, six different meditations are taught. These are all based on the core Buddhist practices of the Mindfulness of Breathing and *Metta Bhavana* (the development of loving kindness). The six practices are:

a. Body Scan—a meditation that involves progressively resting awareness on physical sensations in the body as a way of reducing conceptual elaborations.

b. Breathing Anchor—a meditation that trains awareness on the physical sensations and movements of breathing—again to reduce conceptual elaborations as well as focus the mind.

c. Compassionate Acceptance—a meditation where one opens awareness to include unpleasant sensations with an attitude of self-compassion, tenderness, and care. This helps to soften habits of resistance and aversion.

d. Treasure of Pleasure—a meditation that focuses on "seeking out" pleasant aspects of moment-by-moment experience. This helps to strengthen the neural pathways of positive emotion.

e. Open Heart—a meditation that cultivates broad, warm, receptive, non-reactive awareness.

f. Connection—a meditation where one broadens awareness to include others. This builds empathy and compassion.

The Body Scan and Breathing Anchor cultivate FA (focused awareness/ *shamatha*). The Compassionate Acceptance, Treasure of Pleasure, Open Heart, and Connection are an adaptation of the *Metta Bhavana* and help with the development of kindness and compassion. OM (open monitoring/ *vipashyana*) is particularly cultivated in the Open Heart practice.

Taken together, all the meditations help to cultivate precise awareness of physical, mental, and emotional experience (FA), an ability to rest within the flow of life and to cultivate non-reactive equanimity (OM), and a quality of warmth and compassion toward both self and others. As Zeidan et al. (2010) describe, meditative approaches that combine different approaches to meditation have been shown to be effective in reducing pain even after relatively brief training.

2 **Mindfulness in daily life**. This includes a detailed activity management module using diary-based approaches to pacing. This weakens "boom and bust" patterns of over-activity on good days followed by periods of exhaustion and inactivity—patterns that are so prevalent amongst individuals living with chronic pain (or indeed any chronic health condition). "Three-minute breathing spaces," originally developed for use in mindfulness-based cognitive therapy (MBCT), are also taught. These are an effective way to insert pauses into daily life and reconnect with self-awareness and choice.

3 **Mindful movement**. This is based on very gentle yoga and pilates. Essentially what is being taught is a moving meditation with the emphasis on the *quality* of awareness *as* you move, rather than how far you can move or stretch. This training can then be applied to all the movements of daily life such as opening doors, lifting household objects, etc.

4 **Working with thoughts and emotions**. Central to MBPM is the notion that by becoming aware of one's mental and emotional tendencies, one no longer needs to be a victim of them. Emphasis is placed upon the concept that "thoughts are not facts, even those that say they are!" (Segal et al. 2002, p. 244). Participants are also taught how to look "at" thoughts rather than "from" them (Smith and Hayes 2005, p. 66), seeing thoughts as transitory mental events, in order to overcome habits of being over-identified with the content of passing thoughts.

5 **Habit releasers**. These are simple activities to bring into daily life to provide an opportunity to cultivate mindfulness, rather than being caught up in unhelpful habits. Examples include: Watching the sky for a few moments and seeing thoughts and emotions as passing weather events rather than mistaking them for substantial and enduring entities; spending some time in nature; waiting for the kettle to click off when it has boiled rather than rushing to make the tea or coffee; and committing random acts of kindness.

Taken as a whole, all the different elements of the program allow for a thorough transformation in the individual's response to pain and difficulty. Formal meditation practice is only one element. Emphasis is also placed on bringing awareness and kindness to the activities of daily life and to a gradual positive re-orientation of behavior and attitudes.

The Buddhist roots to MBPM

Underlying all the different elements of the program are core Buddhist teachings. Two Pali Canon texts in particular stand out as being especially relevant to pain management, the Sallatha Sutta and Satipatthana Sutta, and we also draw on key compassion approaches. Language has been adapted to be suitable for a health care intervention but the underlying principles have been developed over the 2500-year history of Buddhist practice.

Salattha Sutta

In this Sutta the Buddha is asked to describe the difference between the response of a wise person and that of an ordinary person to pain. He goes on to use an analogy for physical pain as like being pierced by an arrow. Any human being will experience this, at least from time to time, as unpleasant sensations come

with the territory of being human. He goes on to say an "ordinary" (unwise) person reacts with resistance and resentment and this is akin to being pierced by a second arrow. So, they then have the pain of two arrows:

> When an ordinary person experiences a painful bodily feeling they worry, agonise and feel distraught. Then they feel two types of pain, one physical and one mental. It's as if this person was pierced by an arrow, and then immediately afterwards by a second arrow, and they experience the pain of two arrows . . .
>
> Having been touched by that painful feeling, they resist and resent it. They harbour aversion to it, and this underlying tendency of resistance and resentment towards that painful feeling comes to obsess the mind . . .
>
> Being overwhelmed and dominated by pain, the ordinary person is joined with suffering and stress (Burch 2008, pp. 41, 43).

According to the Buddha, there is an alternative response to painful bodily feelings, which is that of a wise person:

> When a wise person experiences a painful bodily feeling, they don't worry, agonise and feel distraught, and they feel physical pain but not mental pain. It's as if this person was pierced by an arrow, but a second arrow didn't follow this, so they only experience the pain of a single arrow . . .
>
> The wise person is not joined with suffering and stress. This is the difference between the wise person and the ordinary person (Burch 2008, p. 47).

At Breathworks this Sutta forms the core theoretical basis for the program. We call the first arrow Primary Suffering and the second arrow(s) Secondary Suffering, and suggest that MBPM can help us accept the Primary Suffering and reduce or overcome Secondary Suffering.

As the Buddha says, Primary Suffering/first arrow is a "given" in the moment it is experienced and the mindful response is an attitude of kindly acceptance. Secondary Suffering comes from reacting to the Primary Suffering with resistance and aversion—all the ways we act out "I don't want this to be happening." This Secondary Suffering causes the majority of distress, and usually manifests within two extremes of avoidance (blocking) and overwhelm (drowning). Blocking includes behaviors such as addictions, restlessness, an inability to stop, and "headiness." Drowning includes behaviors such as depression, being overwhelmed and taking to bed, self-pity, and a tendency to catastrophize and lose perspective. People with chronic pain often cycle between these poles, running away from unpleasant experience until they become exhausted, and then falling into an overwhelming loss of perspective and low mood.

As the Buddha says in the Sallatha Sutta, we can move toward acceptance of Primary Suffering and avoid Secondary Suffering by being like the wise person who "discerns and understands" his or her feelings "as they are actually present." In other words, pay attention to experience as it really is, without trying to

block it out or feeling overwhelmed. By coming back to present moment body awareness, primary sensations can be accepted with an attitude of kindness and care, and Secondary Suffering can dissolve away. Central to this perception is also the direct seeing into the nature of pain—that it is a flow of changing sensations rather than an unchanging "enemy." This leads to the overall experience of suffering being lessened, often dramatically.

Satipatthana Sutta

Another key Buddhist text that underlies the Breathworks program (MBPM) is the Satipatthana Sutta, widely considered one of the central texts on mindfulness in the Buddhist tradition. This Sutta clearly lays out the process of perception for human beings and, like the Sallatha Sutta, it divides experience into aspects that are a "given" in each moment (Primary) and aspects that are active—either reactive/destructive or creative/responsive (Secondary).

Primary experience consists of bodily awareness as well as the first glimmerings of perception that arise through the senses, called "vedana" in Pali, the language of the early Buddhist texts. This is generally translated as "sensations" or "feelings" and refers to "feeling" in the specific sense of whether sense impressions are pleasant, painful, or neutral when they first come into awareness. In the case of pain, these sense impressions will enter awareness as painful or unpleasant vedana. The Buddha stated that in any present moment these two aspects of perception—body and sensations—will be present for everyone, whether we are wise or not, simply because all human beings have a body with sensing apparatus.

The Buddha made it clear in this Sutta that the task of the mindful person is to cultivate awareness of these first impressions *before* automatic reactions take hold. For individuals living with pain, the task is thus to detect the first glimmerings of unpleasant sensations as they arise in the body, moment by moment. This then creates a "choice point" or "gap" to choose how one wishes to respond, as opposed to automatically experiencing the kneejerk or auto-pilot negative emotions that so quickly arise in the unaware person and are the cause of Secondary Suffering.

With mindfulness one can experience the unpleasant sensations of pain *without* automatically reacting, and see directly into their nature—that they are impermanent and transitory, like everything else in the phenomenal world. One adept in mindfulness will be able to let the painful sensations arise and fall moment by moment, rather like watching clouds pass across the sky. Crucially, when one relates to the sensations of pain in this way, one is free of reactivity and thereby reduces additional suffering.

With the mindfulness skills of mental and emotional agility, one can also learn to pay attention to aspects of awareness that are pleasant, rather than being solely fixated on the unpleasant. Using the principle of "what we dwell on we become," paying attention to those pleasant sensations that have a quality of openness and non-clinging within them—such as those that arise listening to music or being in nature—gives rise to open, expansive, concentrated states of mind and heart that will in turn lead to freedom. The Canadian neuropsychologist Donald Hebb described this as "neurons that fire together wire together" (Hebb 1949). For example, by choosing to place awareness on sensations that contain the first glimmerings of positive emotion, we create neurological pathways whereby these expansive states become more the norm rather than the previously habitual reactive states. By learning to do this again and again, one becomes increasingly adept at choosing positive rather than reactive responses. Thus, transformation is possible. Kabat-Zinn (2004, p. 264) coined the phrase "learning to respond rather than react," which is a helpful, simple description of this approach.

Along with detailed descriptions as to how the perceptual process unfolds, the Satipatthana Sutta also has some important verses that outline key attitudes to bring to the cultivation of mindfulness (known as the definition verses). One can see these as a "call to action" at the start of the text to encourage motivation and engagement. The attitudes identified as important are:

◆ appropriate effort or diligence (*atapi*)

◆ intelligence and clarity in regard to what is coming into awareness through the senses, i.e. clearly knowing experience *(sampajanna)*

◆ knowing what is happening right now, in each moment, i.e. being mindful (*sati*)

◆ letting go of being a slave to likes and dislikes, or more literally, being free from desires and discontent in regard to the world (*vineyya abhijjhadomanassa*).

Throughout the Sutta there is also a "refrain" that echoes between each section of the text like a drum-beat or chorus. This provides dramatic intensity and points out ways to use contemplation of the different aspects of experience to gain insight and liberation. These are:

◆ reflecting on how body, vedana, mood, and mental events are present in both oneself and other people

◆ seeing into the impermanent and insubstantial nature of passing experience

◆ cultivating mindfulness for the purposes of gaining freedom, i.e. not getting caught up in experience

◆ using mindfulness to gain liberation from any kind of clinging.

Anālayo, a leading scholar of the Satipatthana Sutta, sums up the whole text with these four words: *Keep calmly knowing change* (Anālayo 2004). Taken in its depth and profundity, this approach will free the individual living with pain from all reactive suffering.

Loving kindness, compassion, and the Brahma Viharas

Alongside these core mindfulness texts, the Breathworks MBPM program also draws on key loving-kindness and compassion teachings from the Buddhist tradition. This is in keeping with the Buddhist path as a whole, where equal stress is placed on meditations that cultivate positive emotions and those that cultivate awareness. Positive emotion is the precursor to compassion, and awareness is the precursor to wisdom. Taken together, compassion and wisdom are traditionally seen as the two wings of enlightenment—providing a balanced and integrated approach to freeing the heart and the mind from ignorance, craving, and hatred, considered the three root poisons in Buddhist psychology.

The meditations that cultivate positive emotion in Buddhism are presented as a set of four, collectively known as the Brahma Viharas, or Divine Abodes. The first Brahma Vihara/divine abiding is the fundamental quality of *metta*, most commonly translated as loving kindness. This is an emotional attitude of warmth, love, and kindly concern both for oneself and for others. The other divine abidings are emotional qualities that arise when *metta* encounters particular aspects of experience:

- *Karuna* (compassion) arises when *metta* comes into contact with suffering, either one's own or that of others.
- *Mudita* (sympathetic joy) arises when *metta* comes into contact with the good fortune of another. It is a benevolent feeling of good will and rejoicing as opposed to the opposite of *mudita*, which is envy or jealousy.
- *Upekkha* (equanimity) is the pinnacle of the divine abodes and expresses an ability to maintain an even, stable quality of mind under all circumstances. It is an unshakeable freedom of mind and heart and a state of inner equipoise that is not disturbed by the inevitable ups and downs of life.

Studies show that those who are low in scores of mindfulness, and who find it difficult to treat themselves with compassion and kindness, suffer pain of greater intensity (Costa and Pinto-Gouveia 2011). Their overall physical and mental health tends to be poorer too. Research carried out at Duke University Medical Center in the USA found that cultivating "loving kindness" through meditation could substantially reduce pain (Carson et al. 2005). Another study, carried out at Emory University, USA, found that it can reduce inflammation (particularly important for diseases such as arthritis) and boost the

immune system (Pace et al. 2009; see also Halifax 2011). Simply treating yourself with a little more kindness and compassion can also yield significant benefits. Eighty-eight obese individuals who suffered from persistent pain completed a self-report assessment measure before or after their appointment with their anesthesiologist. Hierarchical linear regression analyses demonstrated that even after controlling for important demographic variables, self-compassion was a significant predictor of negative affect (b ¼ 0.48, P < 0.001), positive affect (b ¼ 0.29, P ¼ 0.01), pain catastrophizing (b ¼ 0.32, P ¼ 0.003), and pain disability (b ¼ 0.24, P < 0.05) (Wren et al. 2012).

In the traditional structure of Brahma Vihara meditations from the Buddhist tradition, the practitioner follows several stages. Only the first stage is devoted toward oneself and the other stages are structured around cultivating loving kindness toward others, and ultimately all of sentient existence. It is obvious from this structure that loving kindness toward others is seen as tremendously important in traditional Buddhist approaches to meditation. Seen more deeply, it is through this kind of meditation that we come to see into the interconnected and fluid nature of experience. The boundaries between self and other begin to break down, including the illusion of a fixed and unchanging essence in both oneself and others.

When dealing with pain, this shift in perspective from being dominated by self toward "taking one's place in humanity" offers the opportunity for a profound shift in perspective in terms of the *meaning* one brings to the experience of pain. When contracting against pain and dominated by resistance, pain can be perceived as a cause of isolation from others. One can feel alone in a world where everyone else's experience seems preferable to one's own. However, when engaging in loving kindness meditation, there is a particular focus on using imagination to empathize with others and identify with their experience. Seen from this perspective it becomes apparent that everybody suffers in one way or another, at least from time to time, and nobody likes this experience of suffering. One's personal experience of pain then becomes an opportunity for empathy with the suffering of others. Because you know what it is like to feel pain, by inference you know what it is like for others to feel pain, and so you can feel sympathy with their experience. That is a radically different perspective. Rather than pain leading to emotions of isolation, pain leads to emotions of empathy and connection. This reduces Secondary Suffering greatly.

A participant on a MBPM course summed up this shift in perspective very well:

> I think the biggest thing for me being on the course was recognising that my pain didn't isolate me, in fact it was my pain that made me human . . . and I was able to accept that . . . everybody experienced pain to some degree and some level . . . and that it wasn't unique to me and instead of feeling isolated and apart I could use it as a way of engaging with other people.

Conclusion

The Personal Meditation Journey below describes my own journey. It described how spinal injuries in my teens made the investigation of meditation for pain management an intensely personal matter. This chapter began with a discussion of what we mean by pain and the different ways that pain manifests: acute, chronic, and neuropathic. I suggested that the pervasive nature of chronic pain in our culture (affecting about one in five people) means we have a silent epidemic on our hands. This places an immense burden on both the individual and on health and social care services. I went on to look at how meditation can ease the suffering associated with chronic pain and reviewed the evidence base, before introducing mindfulness-based pain management (MBPM), the program I developed, in more detail. The chapter concluded with a review of the Buddhist roots of MBPM, which includes the Sallatha and Satipatthana Suttas from the Pali Canon, as well as the Brahma Vihara approaches to cultivating kindness and compassion toward oneself and empathy and compassion toward others. Taken as a whole, this chapter offers a thorough overview of the promise and opportunities meditation offers to the field of pain management.

Personal Meditation Journey

I experienced my first spontaneous meditative state when I was a fit and healthy 13-year-old, tramping the Routeburn Track in the Southern Alps of New Zealand. One day, as I gazed at the towering peak of Mt Tutoko, I seemed to merge with the mountain and time stood still. It was as if I had become one with something much vaster than my limited self. I was overwhelmed by beauty in what I can only describe as some kind of ecstasy. I have never forgotten that experience and it sowed the seeds for how my life has unfolded.

When I was 16 I suddenly went from being this fit and active girl, to a girl dealing with major physical injury after I fractured a vertebra in my lower spine in a lifting accident. Almost overnight my life changed. Treatment ranged from physiotherapy, traction, and having my torso in plaster for weeks, to eventually requiring major surgery. Complications required further major surgery six months later and the beginning of a life of chronic pain and physical disability. This ended my dreams of living in the mountains as a wildlife officer and drove my awareness inwards as I sought ways to deal with the pain.

Five years later I fractured the middle of my spine in a car accident. Although I recovered adequately, the culmination of injuries was too much for my body to bear. Further complications led me to being hospitalized in an intensive care ward when I was just 25.

The message being delivered was bleak: There were no further medical interventions possible for my spine and I just needed to learn to live with it. In an attempt to help me accept this situation, the hospital chaplain came to see me. This kind man held my hand and took me through a guided visualization meditation practice. He asked me to direct my mind to a time and a place when I'd been happy. Of course I went back to the Southern Alps and found that I was able to recapture some of the awe and wonder I had felt as a teenager. When he guided me back to the present I was stunned to discover how different I felt, simply through what I did with my mind. I was the same girl lying in the same hospital bed, but the ten minutes or so of visualization had dramatically changed my subjective experience. Although my body was broken to some extent, I discovered that my mind could be a tool for healing and well-being, and this was an astonishing and unexpected discovery.

This awoke a hunger in me and when I left hospital I devoured books and cassette tapes of meditations during the many months I was largely confined to my bed. Although this was a grim period in many respects, it did give me the gift of time. I was able to spend many hours each day turning my awareness inward and investigating my mind and heart. Although my dreams of becoming a mountaineer had been shattered, I discovered that, through meditation, I could become a mountaineer of the inner world.

After a couple of years of this "do it yourself" approach to meditation, a friend invited me to accompany him on a yoga weekend at a rural ashram. We rose at 6am each day to do an extensive yoga and meditation session before breakfast. Never one to admit to my limits, I wholeheartedly threw myself in and endured extraordinary pain as I tried to bend my body into shapes that were incompatible with a girl who had been largely bedbound for two years! After breakfast we had to do some gardening and I remember lying behind the cabbages sobbing. But I persevered. To my amazement, by the end of the weekend I felt more flexible than I had for years and felt certain that this was a path I would follow. I started going to yoga at the city center three days a week for a 6am class of yoga and meditation and I also attended many weekend events. Gradually I discovered more about the Hindu philosophy and found it fascinating. But I was less enamored by the humiliations the head teacher regularly heaped upon hapless students, presumably in an attempt to break their egos, and became increasingly suspicious of this approach.

A couple of years later the same friend invited me to go on a Buddhist weekend retreat. Off I went, again not knowing what to expect, and this time I discovered warmth and lightness of being and met people who were in their own individual ways "extraordinarily ordinary." I had never before come across people who exuded such comfort in their own skins and I found them magnetic role models. I intuited that this suited me much

better than the yoga and Hindu approach and started attending Buddhism and meditation classes in Auckland with the Friends of the Western Buddhist Order (FWBO), now renamed the Triratna Buddhist Community. I quickly became committed and when I was 30 I moved from New Zealand to the UK to live at Taraloka, a rural residential Buddhist retreat center for women. I stayed there for five years, attending dozens of retreats, and was ordained into the Triratna Buddhist Order at the end of that time, when I received the name Vidyamala.

When I look back on my early years of meditation I can see how my primary motivation was to escape from my body. I hated the fact that I was disabled and lived with pain and I used meditation to try to cultivate a kind of parallel universe that was pain-free. I managed to keep this up for many years and fooled myself that I was making progress. However, eventually I realized that my whole approach needed to change. I had another severe deterioration in my spinal condition when I was 37, leading to partial paraplegia and requiring me to start using a wheelchair. This took me to a dark place within myself. At this point I had been meditating intensively for over ten years—both mindfulness and *metta* (loving kindness) practices—and yet I felt that my approach was out of balance: Too much striving and not enough acceptance. So began a time of reckoning. I read widely about pain management and meditation. This was in 1997, when the secular mindfulness movement was still very much in its infancy. However, I stumbled across the work of Jon Kabat-Zinn and Stephen Levine, both of whom wrote lucidly about the need to turn *toward* the difficult, rather than try to escape it. I realized that this was the very thing I'd never done through all my meditation experience. I also read widely about how to bring balance into the activities of daily life. In the pain management world this is known as "pacing" or "activity management." I began to bring this very consciously into my own behavior and found it transformative. For example, when writing this chapter, I work for 20 minutes at the computer and then lie down for 15 minutes. This is a far cry from my previous behavior of working until I was in agony and then being wrecked for the rest of the day. The idea of taking a break *before* I needed it was completely revolutionary, but it was the missing piece of the jigsaw.

Gradually I managed to rehabilitate myself again, but this time with a profoundly different attitude. Now I was using meditation to turn toward my experience in its fullness and to bring some compassion and kindness to the pain I was experiencing, before broadening my awareness to rest in a deeper sense of wholeness within the flow of life. I became more integrated and peaceful. Paradoxically, I began to experience life in the very way I had been trying to willfully cultivate in my escapist days.

In 2001 I started running mindfulness-based courses and this formed the basis for mindfulness-based pain management (MBPM) as offered by Breathworks, the social

enterprise I co-founded in 2003. I now teach and write extensively about this approach and there are Breathworks teachers in over 25 countries.

In terms of my own journey, I continue to meditate daily—mindfulness, compassion, and insight practices—and also benefit tremendously from my working life being oriented around kindly present-moment awareness. My back has settled down a lot over the past few years, which seems nothing short of a miracle. I used to think that miracles happened through one blinding flash, but the quiet miracle of my own improvement is a result of a steady application of gentle effort across a very broad front. There is a great lesson in this. Huge change can come about through lots of smaller changes woven into the fabric of ordinary everyday life. In my case these are: Meditation; regular exercise; good diet; going to the Antipodes every English winter, as my condition is much better in the warmth; pacing my activities; wearing a spinal brace; regular osteopathy and acupuncture; and hormonal changes with the menopause. None of these alone would bring about significant change, but taken together they have resulted in a remarkable improvement in my condition. I know it is unlikely that this will last, as I have a lot of metalwork in my spine that will inevitably wear out, but for now I have a life I never imagined would be possible, and for that I am deeply grateful. Meditation has indeed been the key to freedom. Meditation has helped me to change my mind to transform my life and my behavior.

Acknowledgment

References

Anālayo, B. (2004). *Satipaṭṭhāna: The direct path to realization*. Birmingham: Windhorse.

Arthritis Research UK (2010). *Mindfulness-based interventions in the management of chronic pain*. [Online] Available at: https://www.mindfulness.org [Accessed April 19, 2015].

Austin, J. H. (1999). *Zen and the brain: Toward an understanding of meditation and consciousness*, Volume xxiv. Cambridge, MA: MIT Press.

Belsey, J. (2002). Primary care workload in the management of chronic pain: A retrospective cohort study using a GP database to identify resource implications for UK primary care. *Journal of Medical Economics*, **5**, 39–50.

Bond, M. and Simpson, K. (2006). *Pain: Its nature and treatment*. London: Elsevier.

Brown, C. A. and Jones, A. K. (2010). Meditation experience predicts less negative appraisal of pain: Electrophysiological evidence for the involvement of anticipatory neural responses. *Pain*, **150**(3), 428–438.

Brown, C. A. and Jones, A. K. (2013). Psychobiological correlates of improved mental health in patients with musculoskeletal pain after a mindfulness-based pain management program. *Clinical Journal of Pain*, **29**(3), 233–244.

Burch, V. (2008). *Living well with pain and illness*. London: Piatkus.

Carson, J. W., Keefe, F. J., Lynch, T. R. et al. (2005). Loving-kindness meditation for chronic low back pain: Results from a pilot trial. *Journal of Holistic Nursing*, **23**, 287–304.

Cole, F., Macdonald, H., Howden-Leach, H., and Carus, C. (2005). *Overcoming chronic pain*. London: Robinson.

Costa, J. and Pinto-Gouveia, J. (2011). Acceptance of pain, self-compassion and psychopathology: Using the chronic pain acceptance questionnaire to identify patients' subgroups. *Clinical Psychology and Psychotherapy*, **18**, 292–302.

Deikman, A. J. (1966). De-automatization and the mystic experience. *Psychiatry*, **29**, 324–338.

Donaldson, L. (2008). *Chief Medical Officer's annual report*. London: The Stationary Office.

Fordyce, W. E., Lansky, D., Calsyn, D. A. et al. (1984). Pain measurement and pain behavior. *Pain*, **18**, 53–69.

Gamsa, A. (1994). The role of psychological factors in chronic pain I: A half century of study. *Pain*, **57**(1), 5–15.

Gard, T., Holzel, B. K., Sack, A. T. et al. (2011). Pain attenuation through mindfulness is associated with decreased cognitive control and increased sensory processing in the brain. *Cerebral Cortex*, **191**, 36–43.

Gaskin, D. J. and Richard, P. (2012). The economic costs of pain in the United States. *The Journal of Pain*, **13**(8), 715.

Goyal, M., Singh, S., Sibinga, E. M. S. et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, **174**(3), 357–368. doi:10.1001/jamainternmed.2013.13018

Grant, J. A. and Rainville, P. (2009). Pain sensitivity and analgesic effects of mindful states in Zen meditators: A cross-sectional study. *Psychosomatic Medicine*, **71**, 106–114.

Halifax, J. (2011). The precious necessity of compassion. *Journal of Pain and Symptom Management*, **41**(1), 146–153.

Hayes, S. C., Strosahl, K. D., and Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.

Health Survey for England (2011). *Health, social care and lifestyles*. London: The Information Centre (NHS). [Online] Available at: www.ic.nhs.uk/catalogue/PUB09300 [Accessed December 20, 2012]

Hebb, D. O. (1949). *The organization of behavior: A neuropsychological theory*. New York, NY: John Wiley & Sons.

International Association for the Study of Pain (1994). *Classification of chronic pain*. Merskey, H. and Bogduk, N. (Eds.).Seattle: IASP Press.

Jensen, M. C. (1994). Magnetic resonance imaging of the lumbar spine in people without back pain. *New England Journal of Medicine*, **331**(2), 69–73.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain based on the practice of mindfulness meditation. *General Hospital Psychiatry*, **4**, 33–47.

Kabat-Zinn, J. (2004). *Full catastrophe living*. London: Piatkus.

Kabat-Zinn, J., Lipworth, L., and Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine*, **8**(2), 163–190.

Mindfulness All Party Parliamentary Group (2015). *The mindful nation UK*. Oxford: Oxford Mindfulness Centre. [Online] Available at: http://oxfordmindfulness.org/wp-content/uploads/mindful-nation-uk-interim-report-of-the-mindfulness-all-party-parliamentary-group-january-2015.pdf [Accessed April 28, 2015].

Ochsner, K. N. and Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, **9**, 242–249.

Pace, W. W. T., Negi, L. T., Adame, D. D. et al. (2009). Effect of compassion meditation on neuroendocrine, innate immune and behavioral responses to psychosocial stress. *Psychoneuroendocrinology*, **34**, 87–98.

Royal College of General Practitioners (2013). *Pain management services: Planning for the future*. [Online] Available at: http://www.rcgp.org.uk/clinical-and-research/clinical-resources/~/media/Files/CIRC/Chronic%20Pain/RCGP-Commissioning-Pain-Management-Services-Jan-14.ashx [Accessed April 28, 2015].

Safran, J. D. and Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York: Basic Books.

Sedlmeier, P., Eberth, J., Schwartz, M. et al. (2012). The psychological effects of meditation: A meta-analysis. *American Psychological Association*, **138**(6), 1139–1171. doi:10.1037/a0028168

Segal, Z., Williams, M., and Teasdale, J. (2002). *Mindfulness-based cognitive therapy for depression: A new approach for preventing relapse*. London: Guilford Press.

Smith, S. and Hayes, S. (2005). *Get out of your mind and into your life*. Oakland, CA: New Harbinger Publications.

Vogt, B. A. (2005). Pain and emotion interactions in subregions of the cingulate gyrus. *Nature Reviews Neuroscience*, **6**, 533–544.

Wall, P. (1999). *Pain: The science of suffering*. London: Orion.

Wall, P. and Melzack, R. (1982). *The challenge of pain*. London: Penguin.

Wallace, B. A. S. L. and Shapiro, S. L. (2006). Mental balance and well-being: Building bridges between Buddhism and Western psychology. *American Psychologist*, **61**(7), 690–701.

Wren, A., Somers, T., Wright, M. et al. (2012). Self-compassion in patients with persistent musculoskeletal pain: Relationship of self-compassion to adjustment to persistent pain. *Journal of Pain and Symptom Management*, **43**(4), 759–770.

Zeidan, F., Gordon, N. S., Merchant, J., and Goolkasian, P. (2010). The effects of brief mindfulness meditation training on experimentally induced pain. *Journal of Pain*, **11**, 199–209.

Zeidan, F., Grant, J. A., Brown, C. A. et al. (2012). Mindfulness meditation-related pain relief: Evidence for unique brain mechanisms in the regulation of pain. *Neuroscience Letters*, **520**(2), 165–173. doi:10.1016/j.neulet.2012.03.082

Zeidan, F., Martucci, K. T., Kraft, R. A. et al. (2011). Brain mechanisms supporting the modulation of pain by mindfulness meditation. *Journal of Neuroscience*, **31**, 5540–5548.

Chapter 8

Addictive disorders

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Introduction

At the center of Buddhist teachings are the Four Noble Truths. The first of these truths states that, as sentient beings, we experience suffering. The second truth explains that experiences of craving (wanting what we do not have) or aversion (not wanting what we do have) are at the root of our suffering. Nowhere do we see a clearer and more painful illustration of these truths than in the cyclical trappings and anguish caused by addictive behaviors. Whether we understand the seemingly intractable addictive cycles through traditional Buddhist teachings on craving, or through behavioral principles of conditioning and reinforcement, the challenging and destructive nature of addiction is painfully clear.

The third of these noble truths, however, describes a way out of suffering, and the fourth lays out a path to this end. Recently, treatments for addictive disorders have begun systematically incorporating teachings and practices from this tradition into Western cognitive behavioral treatment approaches to inform integrated secular mindfulness-based programs for treatment of addictive behaviors.

The nature of addiction

Whether or not we struggle with addiction as traditionally defined in Western cultures, the processes that underlie the addictive cycles are common to us all. We all experience craving for something that we do not have, believing it will bring us happiness or relief. Conversely, when we experience discomfort caused by something we do have, such as sadness or physical discomfort, we naturally look for a means of alleviation. This is our nature; we are hardwired to avoid uneasiness. However, without insight into these processes and their potential costs, we often react on "automatic pilot," reaching for what we think is missing

or will most immediately alleviate our distress. For individuals with histories of substance abuse, the desire for alleviation can manifest as craving for a mind-altering substance, often leading to subsequent alcohol or drug use. In the short run, this may indeed bring relief. In the long run, however, it only perpetuates and exacerbates suffering.

Before we can change such deeply ingrained behavioral patterns, we must be awake to them. It is common for clients to report a lack of awareness as to what preceded or caused a relapse or high-risk situation ("All of a sudden, I was in the parking lot of the liquor store"). Bringing greater awareness to day-to-day moments and actions can help raise awareness in such situations. If the client in the liquor store parking lot, for example, was aware of the preceding cognitive, affective, and behavioral processes, he may have been able to make different decisions along the way. Even if he still made the decision to go to the liquor store, being aware of the processes at play may have helped him to reduce the pull of thoughts and emotions, and to be aware that even at this "point of no return," there are still choices.

If reflection on and self-observation of the human tendencies toward craving and aversion can be helpful for stepping out of the addictive cycle, how do we practice this? Through mindfulness meditation, we can train our awareness and undo some of the over-learned behaviors and cognitive patterns. Through practicing non-judgmental observation of the nature of our mind, we begin to see for ourselves how the seemingly automatic progression of triggers, craving, and relapse behaviors functions. In seeing this more clearly, we introduce the possibility of alternative, intentional, and skillful responses.

The roles of habit and "autopilot" in addiction are often accompanied by shame and guilt, also powerful factors in the development and maintenance of addictive behaviors. Feelings of shame and guilt-laden thoughts may predict the transition from a lapse (single instance of the behavior) to a full-blown relapse (return to baseline levels of the behaviors). For example, after a lapse, such as a drink or a cigarette following a period of abstinence, an individual often feels defeated and ashamed, and has thoughts such as, "I failed," or "I knew I couldn't do this." Such a constellation of emotion and thought has been termed the "abstinence violation effect" (Marlatt and Gordon 1985), and can put an individual at greater risk of spiraling further into the addictive cycle. Mindfulness training, or practicing awareness of the constituent parts of such processes while bringing a non-judgmental attitude to an experience, can help break the cycles of shame and self-hatred that are often both causes and results of addiction. Through recognition of the mind's tendencies, not only is there more possibility of choice, but there may also be a recognition of the inherent humanness, versus personal pathology, of these experiences.

Mindfulness and addiction treatment

Over the last four decades, research on applications of meditation and mindfulness-based approaches for an array of psychological problems has grown exponentially. As part of this growth, meditation has begun to receive attention as a potentially useful treatment for individuals seeking help with addiction, and various meditation practices have been evaluated for their effectiveness (Marlatt 2003). Some of the earliest investigations of meditation as a treatment for addiction were Marlatt's preliminary investigations in the early 1970s, evaluating transcendental meditation (TM) as a preventive intervention for high-risk drinkers (Marlatt and Marques 1977). After some promising findings, a subsequent randomized trial of TM-based meditation, in comparison with several other methods of relaxation, provided further evidence of salutary effects of meditation for heavily substance-using individuals. Results indicated that TM was associated with a strong and consistent reduction in substance use, and led to the inclusion of meditation in the Relapse Prevention Model as a potential alternative to substance use and a significant step toward a more balanced way of living (Marlatt 2003; Marlatt and Gordon 1985).

Mindfulness and concentration practices

Within the Eastern-based meditation practices used in contemporary health care, there is a distinction between concentration practices and those intended to develop mindfulness or insight (Baer 2003). During concentrative practice, the meditator's intention is to focus awareness on a particular object (e.g., a mantra, an image, the breath) and thereby limit attention and allow a deep concentration to develop (Zgierska et al. 2008). The intention in mindfulness meditation is for the practitioner to allow awareness to be present-focused and non-judgmental, and in doing so develop insight (*vipassana*) into the causes and conditions of suffering. While earlier studies focused on TM, a concentrative practice, recent research in addictions has shifted to a primary focus on mindfulness-based practices.

It has been proposed that mindfulness meditation might provide additional, specific benefit for individuals experiencing the craving and compulsive behavior characteristic of addiction (Groves and Farmer 1994). Indeed, results from an early trial of an intensive meditation course in an incarcerated population showed evidence of a significant relationship between participation in an intensive ten-day Buddhist "*vipassana*" meditation retreat and substance use, as well as psychosocial outcomes, when compared to participants in the "treatment as usual" condition (Bowen et al. 2006).

For many seeking treatment, however, a ten-day Buddhist meditation retreat may not be appropriate or feasible. As a result, several programs integrating cognitive behavioral approaches with mindfulness practice for alcohol and substance use disorder have been proposed (e.g., Bowen et al. 2009; Garland et al. 2014; Witkiewitz et al. 2005), providing practices to help clients step out of "automatic pilot" or destructive habit patterns into fuller awareness and flexibility. For example, mindfulness-based relapse prevention (Bowen et al. 2009; Witkiewitz et al. 2005) integrates cognitive behavioral relapse prevention treatment (Marlatt and Gordon 1985) with secularized mindfulness practices in an outpatient, eight-week program, designed to be accessible to a broad array of clients and settings. The intention is to offer the best of both Eastern and Western approaches in a format that can be implemented in medical and community treatment settings, and to avoid trappings or limitations of religion-based approaches.

Integration of mindfulness meditation into Western psychology appears to be taking two primary forms, with one fundamental factor that differentiates between the two approaches. In one school of "third wave" behavior therapies, mindfulness practices are integrated into a platform of CBT-based approaches as a supplementary practice, and are thus one of several components of the treatment. For example, dialectical behavior therapy (DBT) and acceptance and commitment therapy (ACT) come from behavioral traditions but contain elements, components, or "modules" integrating mindfulness practice. In contrast, the other emerging group of therapies, recently termed mindfulness-based interventions or MBIs, have at their foundation, and thus part of every session, formal mindfulness meditation practices. These treatments ask their clients, beginning in the very first week, to adopt a daily formal meditation practice into their lives. Thus, third wave behavior therapies and MBIs differ mainly in the degree of focus on formal meditation practice; as one component (in DBT or ACT) versus the core focus of the treatment (in MBIs). The third wave behavior therapies and MBIs have fundamental similarities as well, including using mindfulness practices to help clients increase their focus on present-moment awareness, and learning to discern between what is actually happening in the present moment versus what stories or judgments the mind may be adding. Both have shown promise in the treatment of addictive behaviors.

Among the third wave of cognitive behavioral treatments, acceptance and commitment therapy (ACT) has emerged as a promising field of study (Hayes et al. 2006). Within this approach, the intention is not to change psychological processes, as in the case of more traditional cognitive behavioral therapies; rather, it is to change the individual's relationship to such processes through the development of acceptance and mindfulness skills. According to an ACT model

of psychopathology, addictive behaviors are the result of factors such as experiential avoidance, impulsivity, weak self-knowledge, and a lack of clarity of values (Hayes et al. 2006). Similarly, relief from these pathologies is believed to be achieved through increased psychological flexibility, which is developed through six core skills: (1) acceptance; (2) being present; (3) values; (4) committed action; (5) self as context; and (6) cognitive diffusion (Hayes et al. 2006; see also Bond et al. in Chapter 11 of this volume). The mindfulness skill of "being present" is defined as maintaining consistent, non-judgmental awareness of internal and external experiences. It is thus suggested that this awareness promotes a more direct experience of the world that enhances the individual's ability to act in accordance with his or her value system (Hayes et al. 2006).

Several studies have shown promising results of ACT as a treatment for addictive behaviors. In a preliminary trial, ACT was shown to reduce illicit drug use among methadone-maintained opiate addicts, compared to intensive 12-Step Facilitation (see the next section on "The 12-Step tradition") (Hayes et al. 2004). In another study assessing male and female inpatients at a residential treatment facility, participants receiving six hours of ACT had better treatment outcomes compared to those receiving treatment as usual (Luoma et al. 2012). Finally, in an outpatient setting for tobacco smoking cessation, participants receiving ACT reported better smoking outcomes at one year compared to those receiving nicotine replacement therapy (Gifford et al. 2004).

A related third wave approach is Spiritual Self-Schema therapy (3-S; Marcotte et al. 2003), a protocolled intervention that integrates a cognitive model of self within a Buddhist psychology framework, appropriate for people of all faiths. It was designed to help individuals struggling with addiction to develop a "self-schema" for compassion that supports abstinence from alcohol and other drugs, and HIV preventive behavior. To date, there have been no randomized controlled trials examining 3-S as a treatment for addiction. One small uncontrolled trial did find that 3-S was effective in changing several outcomes that are relevant to addiction, most notably impulsivity and motivation for change (Amaro et al. 2010). Another small trial found that participants in 3-S, in combination with methadone maintenance, showed greater reductions in impulsivity and drug use than a non-randomized standard care group that included methadone maintenance without 3-S (Margolin et al. 2007).

Dialectical behavior therapy (DBT; Linehan 1993) is a skills-based therapy originally developed for the treatment of suicidal individuals and those with borderline personality disorder. DBT includes the addition of principles from Zen practices. The core mindfulness techniques encompass practicing observation of life experience, including one's emotions and behaviors. The aim is for one's emotional mind and reasonable mind to become balanced and joined into

"wise mind," which is capable of intuitive knowledge. The skills of observing, describing, and participating with one's experiences are termed the "what" skills. The "how" skills involve taking a non-judgmental stance, focusing on one thing in the moment, and being effective. Through these techniques, clients not only develop better self-awareness but are able to participate wholly in activities with less judgment and worry. Ultimately, these mindfulness skills are important within all of the other DBT modules (emotion regulation, distress tolerance, and interpersonal effectiveness).

Several studies have been conducted assessing DBT for the treatment of addictions. A randomized clinical trial compared the efficacy of DBT to treatment as usual among women with borderline personality disorder drug dependence. Those in the DBT condition had significantly more days of abstinence from drugs and alcohol, corroborated by urinalysis results (Linehan et al. 1999). When DBT was compared to comprehensive validation therapy plus 12-Step (CVT + 12S) in treating opioid dependence in women with borderline personality disorder, both conditions reported reductions in opiate use. However, those in the CVT + 12S condition significantly increased opiate use during the final four months of treatment (Linehan et al. 2002). A recent review by Bankoff et al. (2012) indicated that DBT is also effective in reducing eating-disordered behaviors.

The 12-Step tradition

While there has been a recent surge in integration of meditation into treatment for addictions, we can trace the roots of this application back many decades, across several treatment traditions, orientations, and programs. For example, in traditional Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) groups, participants are encouraged to work the "12 Steps," a set of instructions aimed at integrating recovery principles into their lives. In the eleventh step of this program, participants are encouraged to deepen their individual spiritual practices by incorporating "prayer and meditation" into their recovery routines. Traditional AA and NA groups are characterized by a distinctly Judeo Christian slant, but effort in recent years has been made to incorporate a wider range of religious preferences (Gorski 1989). The perspective and approach to meditation in this tradition, however, may differ from meditation in other traditions; it may be more oriented toward prayer and reflection rather than observation of moment-to-moment experience.

Recently, there has been an attempt to bring more mindfulness-based meditation into 12-Step practices. For example, Kevin Griffin is a Buddhist meditation teacher and long-time 12-Step practitioner who advocates the integration

of 12-Step principles with mindfulness meditation. In his book, *One Breath at a Time: Buddhism and the Twelve Steps*, Griffin (2004) endeavors to characterize the relationship between the 12-Steps and Buddhism. Similarly, Noah Levine, a Buddhist teacher, counselor, and writer, explores his own journey to sobriety through the help of meditation practices such as awareness of the breath (Levine 2004).

Buddhist Recovery Network

The Buddhist Recovery Network (BRN), founded by Griffin, Levine, and others, is an organization with international chapters that offers help to individuals with addictive behaviors through the use of Buddhist teachings, principles, and practices. All Buddhist traditions are welcome and one does not need to identify themselves as a Buddhist to be involved. A strong parallel is drawn between the eleventh step of 12-Step programs and the BRN's recovery support through the use of mindfulness and meditation. The program is aimed at strengthening one's recovery through the practice of meditation, a sense of community, and ethical principles (e.g., non-harming) drawn from Buddhism.

Tao of recovery/sobriety

Several self-help books are viewed as classics within the field of mindfulness and addiction. *The Tao of Recovery—A Quiet Path to Wellness* by Jim McGregor (1997) applies the principles of Taoism to recovery, and is a resource for those suffering from addiction and for the family and friends of those impacted by addiction. The book consists of four sections: Being, Awakening, Recovering, and Living. Its structure of 81 short verses parallels the classic Chinese text of Lao Tzu's *Tao Te Ching* (Tzu 1974) and connects teachings to the recovery process, incorporating the author's experience with recovery. Gregson and Efran's *The Tao of Sobriety: Helping You Recover from Alcohol and Drug Addiction* (2002) also applies the Eastern philosophy of Taoism to recovery. The book contains a variety of exercises, including meditations and content for contemplation and affirmations. The book is based on Taoist precepts (guidelines for living) to offer a gentle way for the reader to let go of suffering, particularly by learning how to be free of guilt that may maintain addiction.

Review of the research

Several studies have examined the feasibility and efficacy of integrated, secularized, mindfulness-based treatment for alcohol and other substance use disorders (SUDs), as well as cigarette smoking and eating disorders. Several of these

studies have found mindfulness-based approaches to be more effective than no treatment/wait-list/standard care control groups (Bowen et al. 2009; Brewer et al. 2011) and in some studies, more effective than existing evidence-based treatments (Bowen et al. 2014; Witkiewitz et al. 2014). In a review of 24 studies, Chiesa and Serretti (2014) concluded that mindfulness-based interventions can significantly decrease the consumption of alcohol and illicit drugs. Discussed here are a sample of the programs and studies of these interventions.

Findings from one pilot study by Zgierska and colleagues (2008) indicated that mindfulness-based outpatient intervention was feasible, well received by participants, and associated with significant improvements in stress, depression, and anxiety. Additionally, participants reported reduction in drinking behaviors that were maintained four months after the end of the course (Zgierska et al. 2008). A subsequent pilot study, conducted by Brewer et al. (2009), assessed a similar mindfulness-based approach, comparing the effect of mindfulness training to cognitive behavioral therapy for treatment of alcohol and/or cocaine use disorder. Results indicated that both treatments were acceptable, and there was no difference in alcohol or drug use between the groups. However, laboratory tests indicated a greater reduction in psychological and physiological stress during a protocol designed to elicit a stress reaction for participants in the mindfulness training condition compared to participants in the CBT group.

Mindfulness-oriented recovery enhancement (MORE) is a program developed by Garland and colleagues (2014) that provides individuals with opportunities to practice and develop awareness and acceptance of moment-to-moment experience. Uniquely, this model of mindfulness training targets mechanisms believed to drive chronic pain and problematic opioid use. In a study evaluating the efficacy of MORE, investigators found significant improvements in problematic pain symptoms post-treatment, but changes were not significant at a three-month follow-up (Garland et al. 2014).

While there have been a sizable number of preliminary investigations evaluating the feasibility, acceptability, and efficacy of mindfulness-based treatments for addiction, until recently few studies had investigated the relative effectiveness of mindfulness-based approaches compared to more conventional cognitive behavior therapy and traditional 12-Step treatment. Two recent randomized clinical trials by our research team (Bowen et al. 2014; Witkiewitz et al. 2014) provide evidence for the efficacy of mindfulness-based relapse prevention (MBRP) in treating SUDs. Bowen and colleagues (2014) examined the relative efficacy of group-based MBRP, cognitive behavioral RP, and treatment as usual (TAU; which consisted of 12-Step and psychoeducational components) among individuals (N = 286) who completed intensive outpatient or inpatient treatment for SUDs. At six-month follow-up, individuals randomly assigned to

either RP or MBRP had significantly better outcomes (defined as fewer days of drug use and heavy drinking) than those assigned to TAU. However, at the 12-month follow-up MBRP participants had fewer drug use days and an increased rate of abstaining from heavy drinking than both RP and TAU.

Subsequently, Witkiewitz and colleagues (2014) examined the efficacy of group-based MBRP compared to RP within the context of residential treatment for female criminal offenders. Individuals ($N = 105$) were randomized to receive eight weeks of MBRP or RP during the course of a six-month residential addiction treatment program, and were later followed for 15 weeks post-release from the program. Individuals randomly assigned to MBRP had significantly lower rates of drug use, fewer drug-related consequences, and lower addiction severity at follow-up, compared to those assigned to RP.

In addition to reductions in substance use, studies indicate that mindfulness-based interventions are associated with other benefits. These include decreased craving (Bowen et al. 2009; Vieten et al. 2010), an attenuation of the association between depressive symptoms and craving (Witkiewitz and Bowen 2010), decreased cue reactivity (Brewer et al. 2010; Garland et al. 2010), and reduced shame (Luoma et al. 2012).

Recent evidence suggests that mindfulness-based and related interventions may also be effective for smoking cessation (Chiesa and Serretti 2014). Brewer and colleagues (2011) demonstrated that eight sessions of group-based mindfulness training was associated with significant reductions in cigarette use, as compared to the American Lung Association's Freedom from Smoking Treatment. Moreover, in this study self-reported mindfulness meditation practice outside of treatment sessions was correlated with less cigarette use. Studies indicate that ACT may also be effective in treating nicotine dependence. For example, Hernández-López and colleagues (2009) found long-term benefits of ACT over CBT in reducing smoking, and Gifford and colleagues (2004) showed that participants who had received ACT had higher quit rates at one-year follow-up compared to those who had received only nicotine replacement therapy.

There is also preliminary, yet promising, empirical support for mindfulness-based and related interventions in the treatment of eating disorders and in the promotion of weight loss among obese or overweight individuals. These interventions similarly combine mindfulness practices, targeting awareness and tolerance of discomfort, with more traditional cognitive and behavioral approaches. Two small, wait-list controlled trials (Safer et al. 2001; Telch et al. 2001) and one sizeable randomized controlled trial (RCT; Safer et al. 2010) provided evidence for the efficacy of DBT in treating binge eating disorder (BED). Mindfulness-Based Eating Awareness Training (MB-EAT; Kristeller and Wolever 2011) also holds promise as a treatment for BED. In an RCT of 150 overweight and obese

individuals with BED, both MB-EAT and a psychoeducational/cognitive behavioral intervention produced significant reductions in binge eating and depression over a wait-list control group (Kristeller et al. 2013).

Compared to BED, there has been considerably less research on MBIs for anorexia nervosa (AN) and bulimia nervosa (BN). Preliminary evidence suggests that a mindful eating group (Hepworth 2011) and ACT (Juarascio et al. 2013) may be effective adjunctive treatments for individuals with AN and BN. Moreover, Juarascio et al. (2010) found that ACT reduced disordered eating in a subclinical population to a greater extent than cognitive therapy, suggesting that ACT may be an effective treatment for subclinical eating pathology.

In relation to mindfulness-related interventions as weight loss interventions, several studies suggest that ACT may be effective. In a sizeable RCT, Forman and colleagues (2013) demonstrated that ACT produced significantly greater weight loss compared to a standard behavioral treatment when the interventionist was a weight control expert. Additionally, two open trials (Forman et al. 2009; Niemeier et al. 2012) and two smaller controlled trials of ACT for weight loss (Tapper et al. 2009; Weineland et al. 2012) provide evidence for ACT as a weight loss intervention.

Limitations of current findings and future directions

Despite the positive findings from initial studies on mindfulness-based and mindfulness-related interventions for substance use disorders, smoking, eating disorders, and obesity, many of the extant studies included small sample sizes, lacked randomization to treatment, and did not employ well-established treatments (i.e., cognitive behavioral therapy) as comparison groups. Additionally, there is a wide variety of mindfulness involvement in interventions, with some interventions emphasizing formal meditation (i.e., MBRP) more than others (i.e., DBT, ACT). Thus, it is still unclear whether practicing formal meditation is a mechanism of action in mindfulness interventions. Finally, while mindfulness-based interventions appear effective as aftercare treatments or additive components to existing interventions, there is still limited evidence to suggest that mindfulness-based interventions can be effective as primary stand-alone treatments. Altogether, although current evidence indicates that MBIs and other third wave therapies are promising treatments for substance use disorders, eating disorders, and obesity, there is still a need for more rigorous research on the efficacy and mechanisms of action of mindfulness-based interventions compared to other well-established treatments.

Conclusions

Limitations of the approach and new directions for research and treatment

There are numerous limitations to the current research on mindfulness-based treatments. One of the primary issues is the lack of consensus on an operational definition of mindfulness that adequately captures changes in mindfulness (present moment awareness, non-judgment, non-reactivity) often targeted in treatment. Also lacking are objective or behavioral measures of mindfulness practice that would allow assessment of mindful awareness, non-judgment, and non-reactivity without relying on self-report. Additional limitations include the diversity of treatments that individuals are receiving as part of mindfulness-based treatments, with some including components of CBT, DBT, or other alternative treatments. Dismantling studies that refine the active ingredients of mindfulness treatment are necessary to improve our understanding of what works in treatment.

The field of mindfulness-based treatment is relatively young and is both rich with promise and fraught with unanswered questions. New directions for research include developing behavioral/objective measures of mindfulness practice, gaining a better understanding of the neurobiological and psychophysiological correlates of successful outcomes following mindfulness-based treatment, and developing methods for dissemination and implementation of mindfulness-based treatments in community settings. There are also many questions related to the treatment of addiction using mindfulness-based approaches. For example, many studies have been conducted in group formats, but therapists in the community often use an individual form of the group interventions. As noted above, the importance of the personal mindfulness practice of the treatment provider (and possibly the treatment agency staff) needs to be examined.

Overall, despite these limitations, mindfulness-based treatments appear to hold promise as an alternative or supplement to traditional 12-Step, CBT, and relapse prevention approaches in the treatment of addictive behaviors. We are at the beginning; there are many questions remaining to be explored, but preliminary evidence from increasingly large randomized controlled trials suggests that these questions are worth pursuing. Research designed to better understand and improve the processes underlying mindfulness-based treatments, and efforts to increase the dissemination and implementation of these effective interventions, is now needed. While there are now several research trials, there has been relatively little work on dissemination of these programs. We have yet to study training and supervision models for therapists, for example, and the implementation of these

treatments in varied settings and diverse different populations. Future studies should also include the longer-term trajectories of participants in these groups.

Effective treatment of addictive behaviors remains a challenge for clinicians and researchers, and is ever more important for modern societies. Drawing upon age-old wisdoms and practices offers promise, and while we are at the beginning, it is an exciting and intriguing exploration.

Personal Meditation Journey

It has been a rich journey as we, authors of this chapter, have explored and deepened our own practice while, in sometimes elegant and sometimes messy parallels, examining data and integrating questions and theories back at the lab. This multidirectional flow between lab, clinic, and retreat practice has offered a rich, ever-growing experience, filled with questions, curiosity, and vitality. Mostly, this integration has nurtured the questioning and curiosity that is at the heart of both our meditation practice and the science with which we study it.

Although authors of this chapter have since moved along to other institutions and positions, several of us were fortunate to study under the tutelage of Dr. Alan Marlatt. As human as any of us, and more courageous and visionary than most, he dedicated his personal and professional efforts to meditation practice and the study of addiction, and allowed his students and junior colleagues the space and encouragement to do the same. Many of us, while working in the lab, would take a week or ten days off of work to go sit a retreat. This was fully supported, regardless of the time it took away from his lab.

It is a beautiful and unique model, especially for those of us in academia, to be able to explore our own experiences and invite first-person observational learning into our science, and to sit squarely in the middle of human experience rather than endlessly theorizing from a safe distance. We were invited to allow our own humanity, rich with struggle and questioning, to inform and enrich our research and clinical work. We are grateful for this; it laid a foundation for this way of working, and it will remain at the center of our work from here forward.

References

Amaro, H., Magno-Gatmaytan, C., Melendez, M. et al. (2010). Addiction treatment intervention: An uncontrolled prospective pilot study of spiritual self-schema therapy with Latina women. *Substance Abuse*, **31**, 117–125. doi:10.1080/08897071003641602.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology Science and Practice*, **10**, 125–143. doi:10.1093/clipsy.bpg015.

Bankoff, S. M., Karpel, M. G., Forbes, H. E., and Pantalone, D. W. (2012). A systematic review of dialectical behaviour therapy for the treatment of eating disorders. *Eating*

Disorders: The Journal of Treatment and Prevention, **20**, 196–215. doi:10.1080/10640266 .2012.668478

Bowen, S., Chawla, N., Collins, S. E. et al. (2009). Mindfulness-based relapse prevention for substance use disorders: A pilot efficacy trial. *Substance Abuse*, **30**(4), 295–305. doi:10.1080/08897070903250084

Bowen, S., Witkiewitz, K., Clifasefi, S. L. et al. (2014). Relative efficacy of mindfulness-based relapse prevention, standard relapse prevention, and treatment as usual for substance use disorders: A randomized clinical trial. *JAMA Psychiatry*, **98105**, 1–10. doi:10.1001/jamapsychiatry.2013.4546

Bowen, S., Witkiewitz, K., Dillworth, T. M. et al. (2006). Mindfulness meditation and substance use in an incarcerated population. *Psychology of Addictive Behaviors*, **20**(3), 343–347. doi:10.1037/0893-164X.20.3.343

Brewer, G. A., Knight, J. B., Marsh, R. L., and Unsworth, N. (2010). Individual differences in event-based prospective memory: Evidence for multiple processes supporting cue detection. *Memory and Cognition*, **38**(3), 304–311. doi:10.3758/MC.38.3.304

Brewer, J. A., Mallik, S., Babuscio, T. A. et al. (2011). Mindfulness training for smoking cessation: Results from a randomized controlled trial. *Drug and Alcohol Dependence*, **119**(1), 72–80. doi:10.1016/j.drugalcdep.2011.05.027

Brewer, J. A., Sinha, R., Chen, J. A. et al. (2009). Mindfulness training and stress reactivity in substance abuse: Results from a randomized, controlled stage I pilot study. *Substance Abuse*, **30**(4), 306–317. doi:10.1080/08897070903250241

Chiesa, A. and Serretti, A. (2014). Are mindfulness-based interventions effective for substance use disorders? A systematic review of the evidence. *Substance Use and Misuse*, **49**(5), 1–22. doi:10.3109/10826084.2013.770027

Forman, E. M., Butryn, M. L., Hoffman, K. L., and Herbert, J. D. (2009). An open trial of an acceptance-based behavioral intervention for weight Loss. *Cognitive and Behavioral Practice*, **16**(2), 223–235. doi:10.1016/j.cbpra.2008.09.005

Forman, E. M., Butryn, M. L., Juarascio, A. S. et al. (2013). The mind your health project: A randomized controlled trial of an innovative behavioral treatment for obesity. *Obesity*, **21**(6), 1119–1126. doi:10.1002/oby.20169

Garland, E. L., Gaylord, S. A., Boettiger, C. A., and Howard, M. O. (2010). Mindfulness training modifies cognitive, affective, and physiological mechanisms implicated in alcohol dependence: Results of a randomized controlled pilot trial. *Journal of Psychoactive Drugs*, **42**(2), 177–192. doi:10.1080/02791072.2010.10400690

Garland, E. L., Manusov, E. G., Froeliger, B. et al. (2014). Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of Consulting and Clinical Psychology*, **82**(3), 448–459. doi:10.1037/a0035798

Gifford, E., Kohlenberg, B., Hayes, S. et al. (2004). Acceptance-based treatment for smoking cessation. *Behavior Therapy*, **35**(4), 689–705. doi:10.1016/S0005-7894(04)80015-17

Gorski, T. T. (1989). *Understanding the twelve steps*. New York, NY: Herald House/ Independence Press.

Gregson, D. and Efran, J. S. (2002). *The Tao of sobriety: Helping you recover from alcohol and drug addiction*. New York, NY: Thomas Dunne Books.

Griffin, K. (2004). *One breath at a time: Buddhism and the twelve steps*. Emmaus, PA: Rodale, Inc.

Groves, P. and Farmer, R. (1994). Buddhism and addictions. *Addiction Research*, **2**(2), 183–194. doi:10.3109/16066359409109142

Hayes, S. C., Luoma, J. C., Bond, F. W. et al. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, **44**, 1–25. doi:10.1016/j.brat.2005.06.006

Hayes, S. C., Wilson, K. G., Gifford, E. V. et al. (2004). A preliminary trial of twelve-step facilitation and acceptance and commitment therapy with polysubstance-abusing methadone-maintained opiate addicts. *Behavior Therapy*, **35**(4), 667–688.

Hepworth, N. S. (2011). A mindful eating group as an adjunct to individual treatment for eating disorders: A pilot study. *Eating Disorders*, **19**(1), 6–16. doi:10.1080/10640266.2011.533601

Hernández-López, M., Luciano, M. C., Bricker, J. B. et al. (2009). Acceptance and commitment therapy for smoking cessation: A preliminary study of its effectiveness in comparison with cognitive behavioral therapy. *Psychology of Addictive Behaviors*, **23**(4), 723–730. doi:10.1037/a0017632

Juarascio, A. S., Forman, E. M., and Herbert, J. D. (2010). Acceptance and commitment therapy versus cognitive therapy for the treatment of comorbid eating pathology. *Behavior Modification*, **34**(2), 175–190. doi:10.1177/0145445510363472

Juarascio, A., Shaw, J., Forman, E. et al. (2013). Acceptance and commitment therapy as a novel treatment for eating disorders: An initial test of efficacy and mediation. *Behavior Modification*, **37**(4), 459–489. doi:10.1177/0145445513478633

Kristeller, J. L. and Wolever, R. Q. (2011). Mindfulness-based eating awareness training for treating binge eating disorder: The conceptual foundation. *Eating Disorders*, **19**(1), 49–61. doi:10.1080/10640266.2011.533605

Kristeller, J., Wolever, R. Q., and Sheets, V. (2013). Mindfulness-Based Eating Awareness Training (MB-EAT) for binge eating: A randomized clinical trial. *Mindfulness*, **5**(3), 282–297. doi:10.1007/s12671-012-01791-1

Levine, N. (2004). *Dharma punx: A memoir*. San Francisco: Harperone.

Linehan, M. M. (1993). *Skills training manual for treating borderline personality disorder*. New York, NY: Guilford Press.

Linehan, M. M., Dimeff, L. A., Reynolds, S. K. et al. (2002). Dialectical behaviour therapy versus comprehensive validation therapy plus 12-step for the treatment of opioid dependent women meeting criteria for borderline personality disorder. *Drug and Alcohol Dependence*, **67**, 13–26. doi:10.1016/S0376-8716(02)00011-X

Linehan, M. M., Schmidt, H. III, Dimeff, L. A. et al. (1999). Dialectical behaviour therapy for patients with borderline personality disorder and drug dependence. *The American Journal of Addictions*, **8**, 279–292. doi:10.1080/105504999305686

Luoma, J. B., Kohlenberg, B. S., Hayes, S. C., and Fletcher, L. (2012). Slow and steady wins the race: A randomized clinical trial of acceptance and commitment therapy targeting shame in substance use disorders. *Journal of Consulting and Clinical Psychology*, **80**(1), 43. doi:10.1037/a0026070

Marcotte, D. S., Avants, K., and Margolin, A. (2003). Spiritual self-schema therapy, drug abuse, and HIV. *Journal of Psychoactive Drugs*, **35**(3), 389–391. doi:10.1080/02791072.2003.10400023

Margolin, A., Schuman-Olivier, Z., Beitel, M. et al. (2007). A preliminary study of spiritual self-schema therapy for reducing impulsivity in HIV-positive drug users. *Journal of Clinical Psychology*, **63**, 979–999. doi:10.1002/jclp.20407

Marlatt, G. A. (2003). Buddhist philosophy and the treatment of addictive behavior. *Cognitive and Behavioral Practice*, **9**(1), 44–50.

Marlatt, G. A. and Gordon, J. R. (1985). *Relapse prevention: Maintenance strategies in addictive behavior change*. New York, NY: Guilford Press.

Marlatt, G. A. and Marques, J. K. (1977). Meditation, self control, and alcohol use. In R. B. Stuart (Ed.). *Behavioral self-management: Strategies, techniques, and outcomes*, pp. 117–153. New York, NY: Brunner/Mazel.

McGregor, J. (1997). *The Tao of recovery: A quiet path to wellness*. Atlanta, GA: Humantics Publication.

Niemeier, H. M., Leahey, T., Reed, K. et al. (2012). An acceptance-based behavioral intervention for weight loss: A pilot study. *Behavior Therapy*, **43**(2), 427–435. doi:10.1016/j.beth.2011.10.005

Safer, D. L., Robinson, A. H., and Jo, B. (2010). Outcome from a randomized controlled trial of group therapy for binge eating disorder: Comparing dialectical behavior therapy adapted for binge eating to an active comparison group therapy. *Behavior Therapy*, **41**(1), 106–120. doi:10.1016/j.beth.2009.01.006

Safer, D. L., Telch, C. F., and Agras, W. S. (2001). Dialectical behavior therapy for bulimia nervosa. *The American Journal of Psychiatry*, **158**(4), 632–634. doi:10.1176/appi.ajp.158.4.632

Tapper, K., Shaw, C., Ilsley, J. et al. (2009). Exploratory randomized controlled trial of a mindfulness-based weight loss intervention for women. *Appetite*, **52**(2), 396–404. doi:10.1016/j.appet.2008.11.012

Telch, C. F., Agras, W. S., and Linehan, M. M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology*, **69**(6), 1061. doi:10.1037/0022-006X.69.6.1061

Tzu, L. (1974). *Tao te ching*. London: Penguin UK.

Vieten, C., Astin, J. A., Buscemi, R., and Galloway, G. P. (2010). Development of an acceptance-based coping intervention for alcohol dependence relapse prevention. *Substance Abuse*, **31**(2), 108–116. doi:10.1080/08897071003641594

Weineland, S., Arvidsson, D., Kakoulidis, T. P., and Dahl, J. (2012). Acceptance and commitment therapy for bariatric surgery patients, a pilot RCT. *Obesity Research and Clinical Practice*, **6**(1), e1–e90. doi:10.1016/j.orcp.2011.04.004

Witkiewitz, K. and Bowen, S. (2010). Depression, craving, and substance use following a randomized trial of mindfulness-based relapse prevention. *Journal of Consulting and Clinical Psychology*, **78**(3), 362–374. doi:10.1037/a0019172

Witkiewitz, K., Marlatt, G. A., and Walker, D. (2005). Mindfulness-based relapse prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy*, **19**(3), 211–228. doi:10.1891/jcop.2005.19.3.211

Witkiewitz, K., Warner, K., Sully, B. et al. (2014). Randomized trial comparing mindfulness-based relapse prevention with relapse prevention for women offenders at a residential addiction treatment center. *Substance Use and Misuse*, **49**, 536–546. doi:10.3109/10826084.2013.856922

Zgierska, A., Rabago, D., Zuelsdorff, M. et al. (2008). Mindfulness meditation for alcohol relapse prevention: A feasibility pilot study. *Journal of Addiction Medicine*, **2**(3), 165–173. doi:10.1097/ADM.0b013e31816f8546

Chapter 9

Meditation and physical health

Linda E. Carlson

Introduction

There are many styles of meditation practice honed through millennia by practitioners from many countries and regions, as discussed in earlier chapters. These have traditionally been used for purposes of self transcendence, liberation, and being of service to others, rather than specifically for treating symptoms of physical diseases, or even achieving optimal physical health. However, in Western applications of meditation, since the 1960s when Eastern practices were first introduced to the West *en masse*, one of the key applications has been not only mental health and stability, but also achieving optimal physical health. The two best examples of this are the creation of the mindfulness-based stress reduction (MBSR) program by Jon Kabat-Zinn and colleagues at the Massachusetts Medical Centre in 1979 (Kabat-Zinn 1990), followed by various adaptations collectively known as mindfulness-based interventions (MBIs) and the application of transcendental meditation (TM), specifically for the treatment of high blood pressure (Schneider et al. 2005).

This chapter will focus on the mindfulness-based interventions, largely because the bulk of the work has been conducted in this area. The idea of mindfulness stems from traditional Buddhist conceptions, and is typically defined in the West as non-judgmental present-moment awareness (Kabat-Zinn 1990). Shapiro and Carlson (2009) developed the "IAA" model of mindfulness, specifying three components of Intention, Attention, and Attitude. The intention can vary but is typically one of intending to be in the present moment. Attention is the quality and focus of awareness, which is typically on the moment-to-moment fluctuation of the breath, bodily sensation, sound, or thought. Attitude emphasizes the need for the attention to be kind, open, non-judging, curious, and accepting, rather than harsh or critical. Mindfulness is thought of as both a way of being in the world, and a specific practice (mindfulness meditation) that promotes and supports this way of being.

There are several compelling reasons that meditation practices, particularly mindfulness, might be useful in helping people cope with physical

illness and pain. One is simply because mindfulness turns out to be a good antidote to stress, which is known to be associated with a range of illnesses and symptoms. Specific psychological characteristics of the illness experience itself also respond well to a mindfulness approach, such as loss of control, uncertainty about the future, existential worries and life threat, unwanted changes in plans and priorities, and coping with specific treatments and symptoms. In this chapter I will first discuss the rationale for applying mindfulness techniques in the treatment of physical diseases and symptoms in general, and then review the literature on the application of mindfulness-based approaches for specific conditions, ending with suggestions for future research priorities.

The illness experience

To understand the potential benefits of mindfulness in physical medical conditions it may be helpful to think about the illness experience itself. Take the case of cancer, which for almost everyone challenges their world view and self concept, often requiring debilitating and sometimes mutilating treatments, with an uncertain future. On an existential level people are forced to confront their own mortality in a real way, often for the first time. The possibility of one's death becomes real and potentially imminent, and substantial and perhaps permanent changes in functional abilities, appearance, and lifestyle may follow, as well as having to face the possibility of ongoing pain and dysfunction. Life plans are necessarily altered, and the future is premised on whether or not the illness comes back or gets worse. On a psychological level, illness and treatment often produce a sense of unpredictability, loss of control, and feelings of anxiety and fear. After treatment, no matter how successful, for most people there is a lingering fear of recurrence or progression, which turns every ache and pain into a potential life threat. Escalating anxiety can then set up a negative spiral, which results in worsening of the suspicious symptoms due to muscle tension and hypervigilance, followed by greater fear and certainty of recurrence. Mindfulness practices allow a short-circuiting of this process to prevent such escalation.

In general, most people function well because they assume more control over the course of their lives than they really have; diagnosis with a chronic or life-threatening illness throws this inaccurate conception into sharp relief. In response, many people try harder to control some aspects of their lives, but within the framework of diagnosis, treatment, and an uncertain future, this is often a losing battle. The best response is actually to embrace uncertainty, but for many people this is a tall order.

Why mindfulness?

This fundamental inability to control or change the course of illness progression (and ultimately death) is why acceptance-based approaches, such as MBIs, can be especially helpful. The core training in MBIs is the development of stable and kind mindful attention, through repetitive and consistent application of awareness of present-moment experience, with a kind, curious, and non-judgmental attitude. This typically begins with training in focused attention on the breath or bodily sensation through body scanning, sitting meditation, and mindful movement. Once stability of attention has been established through ongoing practice, a broadening of attention ("bare awareness") is applied, which allows people to directly experience the nature of mind for what it is: Transient, impersonal, and constantly changing. Through observation participants can also directly experience how grasping at certain outcomes or states of being causes suffering, and through that insight learn to let go of clinging and personalization of experience. Repetitive practice of alternative responses to difficult emotions or thoughts during meditation helps retrain the brain to respond in ways that are supportive of more positive emotions.

A mindfulness approach is eminently adaptable to a wide array of circumstances. Simply absorbing the general understanding that the only certainty in life is change, and that sometimes the best thing to do to solve a problem is accept it, can be extremely relieving and even liberating to people who are desperately and often frantically trying to fix things. Realizing that in fact they can slow down and see things as they are, without blinders, and learn ways to hold the strong emotions and sensations that arise can be transformative. The further realization that although specific symptoms may be unpleasant, they are tolerable and are also constantly in flux, can provide further liberation from suffering. Stepping back and seeing the racing thoughts, worries, and self-blame as just thoughts, and not necessarily the truth, provides further relief. Hence, change occurs not only by training the mind through formal mindfulness practice, but via a shift in attitude and perspective that allows people to see their illness in a new light, without allowing fear to consume them and to drive behavior.

Mindfulness-based interventions

MBSR emerged in the late 1970s through the combination of popular stress management techniques such as relaxation and deep breathing, with more novel practices and concepts from Eastern meditation traditions (Kabat-Zinn 1990). Jon Kabat-Zinn, the founder of MBSR, himself studied Zen meditation and *vipassana* and distilled some of the key concepts around mindfulness and

the idea of present-moment awareness into a secular program palatable to the Western medical system. The MBSR program is an eight-week group course that includes a six-hour silent retreat near the end of the program. Gentle hatha yoga is incorporated into each class, as are a range of key meditation practices including body scan, sitting meditation, walking meditation, loving kindness (*metta*) practice, and a smattering of other practices such as Mountain or Lake meditations meant to highlight "mountainlike" or "lakelike" qualities in people, which meditation enhances. These may include majesty, stillness, equanimity, rootedness, depth, reflection, etc.

Key also to the MBSR program is reflection on the practices, skilled inquiry by the facilitator, and dialogue around personal practice meant to enhance insight and personal growth. Didactic materials specific to topics such as the stress response, balance in the nervous system, mindful communication, mindful attitudes, and other topics are also often included. The groups are offered in sizes ranging from 8 to as many as 35 in some cases. The basic MBSR model has been adapted and modified to suit the needs of different clinical and non-clinical populations, and to reflect this, different names are often used (such as mindfulness-based cancer recovery (MBCR), our adaptation for people living with cancer). The most well known of these is mindfulness-based cognitive therapy (MBCT), originally developed to prevent depression relapse (Segal et al. 2002), since shown to be effective in many studies (Piet and Hougaard 2011), and now applied to a range of different mental and physical health conditions. As a collective, we refer to these as MBIs.

Summary of the literature

The strategy employed in reviewing research on MBI effects on physical health outcomes is to add to other comprehensive reviews (Carlson 2012; Piet and Hougaard 2011) by highlighting more recent, well-designed studies that may inform further understanding of efficacy and mechanisms of action. The focus is on quantitative studies and primarily randomized controlled trials (RCTs). While there is also an interesting and growing body of qualitative work on MBIs in many disease conditions (Mackenzie et al. 2007), space limitations make it impossible to cover that work here. The review is organized by disease type, rather than type of intervention or outcome studies, with diseases with a greater bulk of research summarized first.

Cancer

Cancer is a leading cause of morbidity and mortality worldwide, with 13 million new cases and 7.6 million deaths recorded in 2008 alone (Boyle and Levin

2008). Due to improvements in treatments and increasing incidence rates, growing numbers of people are living longer after having been treated for cancer. In the USA, an estimated 13.7 million Americans with a history of cancer were alive on January 1, 2012 (American Cancer Society 2012). Cancer treatments and disease processes often leave survivors with symptoms and side effects such as lingering fatigue, sleep difficulties, pain, anxiety, depression, and worries about cancer recurrence (Carlson et al. 2004a). Hence, there is a significant need for psychosocial interventions to help people cope with the difficulties of cancer diagnosis and treatment.

As a response to this need, clinicians and researchers have been interested in applying MBIs to the vagaries of the cancer experience, and there is now a large body of work investigating their efficacy for patients with various types of cancer. This literature has been reviewed on several occasions since 2006 (Lamanque and Daneault 2006; Ledesma and Kumano 2009; Matchim and Armer 2007; Matchim et al. 2011; Musial et al. 2011; Shennan et al. 2011), with four reviews and meta-analyses just in 2012 and 2013 (Carlson 2012; Cramer et al. 2012; Piet et al. 2012; Zainal et al. 2013). A 2011 meta-analysis of 19 studies reported medium effect sizes on mood (d = 0.42) and distress (d = 0.48) (Musial et al. 2011) outcomes, consistent with earlier reviews. Two other meta-analyses focused only on breast cancer patients, reporting large effect sizes on stress (d = 0.71) and anxiety (d = 0.73) across nine studies with various designs (Zainal et al. 2013) and medium effects on depression and anxiety in three RCTs (Cramer et al. 2012). Piet et al. examined 22 randomized and non-randomized studies of cancer patients and reported moderate effect sizes on anxiety and depression in non-randomized studies (0.6 and 0.42, respectively), and slightly smaller effects for RCTs (Piet et al. 2012). Finally, Carlson reviewed all cancer-related studies applying levels of evidence criteria and concluded that there is Level 1 (highest) evidence for the efficacy of mindfulness-based interventions in oncology (Carlson 2012).

The first MBI study in a cancer population was published by our group in 2000, on the MBCR program. It was an RCT that assigned 89 patients with a variety of cancer diagnoses to either MBCR or a wait-list control (Speca et al. 2000). Patients in the program improved significantly more on mood states including anxiety, anger, and depression and on symptoms of stress such as physical tension, cardiopulmonary, gastrointestinal (GI), and cognitive symptoms than controls, with large improvements of approximately 65% on mood and 35% on stress symptoms. In a six-month follow-up, these improvements were maintained (Carlson et al. 2001). More home practice was associated with greater decreases in overall mood disturbance and the greatest improvements were seen on anxiety, depression, and irritability. Since that time

many pre/post observational studies without comparison groups, and RCTs with usual care or wait-list control groups, have been published, citing improvements in a range of outcomes including quality of life (QL) domains such as emotional, social, role, and physical functioning, and psychological improvements on measures including stress symptoms, anxiety, depression, fear, and avoidance (for reviews see Ledesma and Kumano 2009; Matchim et al. 2011; Musial et al. 2011; Shennan et al. 2011).

While a substantial number of RCTs compare MBIs to wait-list or usual care controls, some with quite large sample sizes (Branstrom et al. 2012; Foley et al. 2010; Hoffman et al. 2012; Lengacher et al. 2009), still few studies have included randomization to active comparison groups. One exception is a three-armed trial in which Henderson et al. (2012) randomized 172 early-stage breast cancer patients into MBSR, a nutrition education program matched on contact time, or a usual care control condition. They also included follow-up assessments post-program (four months) and one and two years later. The MBSR group improved more than the other two conditions on a wide range of measures at the four-month post-program assessment, including quality of life, active behavioral and cognitive coping, avoidance, and spirituality, as well as depression, hostility, anxiety, unhappiness, meaningfulness, and several measures of emotional control. These group differences eroded somewhat over time, however, as participants in the other two groups continued to improve more slowly, so that by 24 months the only group differences apparent were on measures of anxiety, unhappiness, and emotional control, still favoring MBSR over usual care, but not the other active intervention. From this study it appears that MBSR participation may help speed up the natural course of cancer recovery across many domains, and also add a shift in perspective and skills in emotion regulation that are lasting.

More recently, we conducted two comparative effectiveness RCTs of the MBCR program: MINDSET and I-CAN Sleep. The MINDSET study directly compared MBCR to another active group intervention for cancer support, supportive expressive therapy (SET; Classen et al. 2008), in 271 distressed breast cancer patients and a minimal intervention control condition (a one-day stress management seminar) (Carlson et al. 2013). Similarities between interventions are the group format, size, structure, and contact hours. However, the two treatment modalities are quite distinct in their content, focus, and theoretical underpinnings, with the focus of SET on group support and emotional expression. We also included only distressed breast cancer survivors, in order to avoid floor or ceiling effects on outcomes, and included both psychological and biological outcomes. Participants in the control group were re-randomized to one of the active interventions, then everyone was followed after either MBSR or SET for a full year

post-program to determine long-term outcomes. The study was also powered for moderator analyses to determine if outcomes differed across groups for people with different baseline characteristics, personalities, and preferences.

Pre-to-post program, women in MBCR improved more on stress symptoms compared with women in both the SET and control groups, on quality of life compared with the control group, and in social support compared with the SET group (Carlson et al. 2013), but cortisol slopes (a marker of stress responding) in both active intervention groups were maintained over time relative to the control group, whose cortisol slopes became flatter, where steeper slopes are generally considered to be healthier. The two intervention groups also maintained their telomere length, a potentially important marker of cell ageing, over time compared to controls (Carlson et al. 2014a). Over the longer-term follow-up of one year, the MBCR participants maintained all the benefits received in the group, while the SET participants still had higher levels of stress and mood disturbance and lower quality of life (Carlson et al. 2015, under review). This suggests that the MBCR group provided longer-term protection from distress for these women compared to those who did not participate.

The most preferred treatment (by over half of participants) was MBCR, and those who got their preferred treatment (regardless of what it was) improved more on quality of life and spirituality over time (Carlson et al. 2014b). Preference seemed to be a more powerful predictor of outcome than individual personality traits. This begins to tell us something beyond what can be learned from classic RCT designs: Preference matters. Treatment credibility and expectancy for benefit are likely important components in harnessing the power of the individual to produce meaningful change.

In another head-to-head comparative effectiveness trial, we also tried something novel for behavioral interventions by blinding participants to treatment. We did this by advertising the study simply as "I-CAN Sleep: Non-drug treatments for insomnia in cancer survivors," and didn't tell participants what the treatments were until they were already enrolled. Even then they only knew about the treatment they received, and didn't know what the other treatment was (S. N. Garland et al. 2011). They were randomly assigned to either MBCR or cognitive behavioral therapy for insomnia (CBT-I), the gold-standard treatment for insomnia. This is a very tough test of efficacy for MBCR, and was designed as a non-inferiority trial to test whether the novel treatment for sleep (MBCR) was *as good as* the gold-standard.

In total, 111 patients with a variety of cancer types were randomly assigned to CBT-I ($n = 47$) or MBCR ($n = 64$) (S. N. Garland et al. 2014). Immediately post-program, MBCR was inferior to CBT-I for improving the primary outcome of insomnia severity, but MBCR was non-inferior three months later. The time

taken to fall asleep was reduced by 22 minutes in the CBT-I group and by 14 minutes in the MBCR group at follow-up. Similar reductions in wake time after sleep onset were observed for both groups. Total sleep time increased by 0.60 hours for CBT-I and 0.75 hours for MBCR. CBT-I improved sleep quality and dysfunctional sleep beliefs, and both groups resulted in reduced stress and mood disturbance. This indicated that while MBCR was slower to take effect, it could be as effective as the gold-standard treatment for insomnia in cancer survivors over time, and is a viable option for patients preferring that type of approach.

In another application, Monti et al. (2013) conducted a large RCT of a novel MBI called mindfulness-based art therapy (MBAT), also in distressed women with breast cancer. A total of 191 women were randomized to either an eight-week MBAT intervention or a breast cancer educational support program. Both groups improved on psychosocial stress and quality of life, but women with high stress levels at baseline improved only in the MBAT group. This shows that this type of intervention can be superior to other active interventions for those with higher need.

One final example of stretching the boundaries of traditional service delivery is a study we conducted of an online adaptation of MBCR for people living in rural and remote areas who didn't have access to face-to-face MBCR groups (Zernicke et al. 2013). We conducted a wait-list RCT comparing those in the online program to a group randomly assigned to wait for the next online program. Our primary interest was in whether people would sign up, and if they would complete the program and get any benefit. The participants attended each week at a set time like an in-person group, and could see and interact with the instructor and the other participants in the online classroom using webcams and headsets. We enrolled 62 people and 83% of those completed the program (similar to in-person programs). All participants said the program either met (40%) or exceeded (60%) their expectations and all said they would recommend the program to other cancer patients. There were significant improvements and medium effect sizes in the online MBCR group relative to controls on total mood disturbance, stress symptoms, and spirituality (Zernicke et al. 2014).

In summary, evidence has accumulated through a number of high quality RCTs comparing MBIs to other active interventions showing superiority across a range of outcomes, in large sample sizes over substantial follow-up periods, but still mostly in breast cancer survivors. More work is needed for other types of cancer, late stage patients, and patients undergoing active treatments.

So far I have reviewed the clinical trials looking at psychological outcomes of MBIs in cancer patients, but a number of studies have also assessed their

impact on biomarkers such as salivary cortisol and measures of immune functioning relevant to stress and cancer progression. For example, Carlson et al. (2003, 2004, 2007) measured immune and endocrine function pre/post MBSR in 59 breast and prostate cancer survivors, showing increased T cell production of IL-4 (an anti-inflammatory cytokine) and decreased interferon gamma (IFN-λ) and NK cell production of IL-10. Patterns of change in cytokines over one year of follow-up also supported a continued reduction in pro-inflammatory cytokines (Carlson et al. 2007). In that group of patients, salivary cortisol profiles also shifted pre- to post-intervention, with fewer evening cortisol elevations found post-MBCR, and some normalization of abnormal diurnal salivary cortisol profiles (Carlson et al. 2004b). Over a year of follow-up, continuing decreases in overall cortisol levels were seen, mostly due to further decreases in evening cortisol (Carlson et al. 2007), recently replicated in a large RCT comparing MBCR to SET and control (Carlson et al. 2013). This is significant as higher cortisol levels, particularly in the evening, are considered to be a potential marker of dysregulated Hypothalamic-Pituitary-Adrenal axis functioning and poorer clinical outcomes, such as shorter survival times in metastatic breast cancer patients (Sephton et al. 2000).

Another group also showed decreased late-afternoon cortisol in combination with re-establishment of NK cell activity and cytokine production toward normal levels post-MBSR compared to controls (Witek-Janusek et al. 2006, 2008). Lengacher and colleagues (2011) reported increased response of T cells to antigen stimulation and an improved ratio of Th1/Th2 cytokines in early-stage breast cancer patients after a six-week MBSR program, and also found decreases in both cortisol and IL-6 pre-to-post session, and decreases in baseline levels across sessions in patients with advanced cancer and their caregivers (Lengacher et al. 2012). The interpretation of these results is complex, but in general an anti-inflammatory environment is thought to be more favorable to cancer outcomes than one with elevated Th2 (pro-inflammatory) cytokines (Armaiz-Pena et al. 2009).

Measures of autonomic system function have also been conducted, since cancer survivors are at high risk for cardiovascular disease due to the toxicity of many cancer treatments. In a group of 72 women with various forms of cancer, weekly home blood pressure (BP) monitoring showed significant decreases in systolic blood pressure over the course of the program for women with higher premorbid BP in MBSR, compared to those in a comparable naturalistic waitlist group (Campbell et al. 2012).

In summary, the literature on cancer and MBIs is substantial and continues to grow, with improving quality of research design through the application of active control groups, larger samples, more diverse patient groups, longer follow-up

periods, and a wide range of outcomes. Outcomes consistently favor MBSR over usual care and other active interventions immediately post-program across a range of psychological and QL outcomes. Its superiority over other active interventions over a longer period of time has yet to be definitively shown, though some specificity of effect is emerging. Its value in improving cancer-related biomarkers also still requires further investigation.

Pain (chronic pain and low back pain)

Chronic pain affects approximately 13% of the population, and is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage that persists beyond the expected time frame for healing, or that occurs in disease processes in which healing may never occur (Ospina and Harstall 2002). The earliest reported application of MBSR was for patients with chronic pain (Kabat-Zinn 1982). Other more specific pain conditions have also been studied, including low back pain, fibromyalgia, rheumatoid arthritis, and migraine. The pain literature has been reviewed in depth on several recent occasions (Chiesa and Serretti 2011; Elabd 2011; Jensen et al. 2014; McCracken and Thompson 2011; Patil 2009; Veehof et al. 2011). Chiesa and Serretti (2011) systematically reviewed all controlled studies ($n = 10$) and concluded that MBIs could have non-specific effects on mood, coping, and pain symptoms in chronic pain patients, but studies often suffered from small sample sizes, lack of randomization, and the use of non-specific control groups. In a meta-analysis of both controlled and uncontrolled studies ($n = 22$), Veehof et al. (2011) found small effect sizes of 0.37 for pain improvements and 0.32 for depression, and suggested that while MBSR and acceptance-based interventions for chronic pain can be viable alternatives to standard CBT for pain, they have not been shown to be superior to it.

While many early studies of MBIs and chronic pain utilized pre/post designs or comparisons to usual care, only three studies have employed randomization to active comparison groups. One study (Plews-Ogan et al. 2005) evaluated MBSR for the management of chronic musculoskeletal pain in 30 pain patients randomly assigned to either MBSR, massage, or a no-intervention control condition. Immediately post-intervention, the massage group had more pain reduction and improved mental health status compared to usual care, while the MBSR group showed greater improvements one month later in mental health outcomes compared to usual care and the massage condition. In this case, MBSR was more effective for enhancing mood in the long term, but massage provided more immediate pain relief.

Wong et al. (2011) compared two active interventions—MBSR versus a multidisciplinary pain intervention, composed of primarily psychoeducation with sessions on physiotherapy for pain and nutrition—for 99 chronic pain patients in Hong

Kong. Patients who completed the interventions improved similarly in both groups on measures of pain intensity and pain-related distress over time. Without a usual care or no-treatment control, it is difficult to conclude if these improvements are due to the interventions themselves or natural fluctuations in symptomatology due to healing over time, historical trends, regression toward average pain and distress, or expectancy effects. However, the non-specificity of treatments is notable.

Finally, in the largest study to date, E. L. Garland et al. (2014) applied an MBI called mindfulness-oriented recovery enhancement (MORE), which was designed to target both chronic pain and opioid misuse in chronic pain sufferers. In 115 patients assigned to either MORE or a support group, reductions in pain severity and pain interference favored MORE and were maintained three months after the program. MORE participants also had greater reductions in stress arousal and desire for opioids and were less likely to meet diagnostic criteria for an opioid misuse disorder post-program compared to the support group, but these benefits were not maintained.

Although the number of RCTs in this area is small, support for MBIs as helpful interventions for improving coping with pain symptoms and overall adjustment in chronic pain patients continues to mount. However, superiority to standard CBT or support groups for pain has not been definitively established.

Fibromyalgia

Fibromyalgia (FM) is a pain-related condition associated with overall bodily stiffness and soreness, pain trigger points located throughout the body, fatigue, and sleep disturbance, where symptoms seem to be exacerbated by stress (Grossman et al. 2007). Earlier pre/post studies and some wait-list or usual care MBI RCTs (Goldenberg et al. 1994; Grossman et al. 2007; Weissbecker et al. 2002) have shown improved pain, sleep, FM impact, global severity of psychological symptoms, coping, quality of life, anxiety, depression, somatic complaints, and sense of coherence. A recent meta-analysis reviewed six trials of MBSR for FM and cautiously concluded that evidence existed for short-term improvements in quality of life compared to usual care, and for both quality of life and pain symptoms compared to active control conditions, but effect sizes were small to medium and effects were not considered robust against bias (Lauche et al. 2013). For example, a recent RCT compared MBSR to usual care in 99 patients and found no group differences on pain, quality of life, physical function, or depression post-program or a year later, but the mindfulness group did improve somewhat faster (Fjorback et al. 2013).

In the largest and most rigorous study reviewed (Schmidt et al. 2011), 177 female patients were randomized to MBSR, an active control condition, or waitlist. The active control was matched to MBSR on format, instructors, contact

time, and homework, with the focus on progressive muscle relaxation and stretching, rather than mindfulness practices. There were no significant differences between groups on the primary outcome of health-related QL two months post-treatment, but all patients improved over time. Only MBSR resulted in significant pre-to-post-intervention within-group improvements in QL, and on six of eight secondary outcome variables, compared to improvements on three measures for the active control group, and on two in the wait-list condition.

Hence, MBSR seems to be a potentially effective intervention for alleviating symptoms common in FM such as pain, depression, and a range of psychological outcomes, although as with chronic pain, it has not proven superior to other active control conditions consistently across studies. MBIs have also not yet been tested against proven efficacious treatments such as CBT, which would provide a more rigorous test of overall efficacy.

Cardiovascular disorders

Cardiovascular disorders are the most common group of diseases in North America and include a range of conditions such as hypertension (high blood pressure), coronary artery disease, heart failure, and angina. The effect of MBIs on cardiovascular disease outcomes and clinical markers has been reviewed elsewhere (Ospina et al. 2007), so here the focus will be on recent applications of MBIs in participants diagnosed with either hypertension or heart disease.

In addition to pre/post studies showing improvements on a range of psychological outcomes in people with heart disease (Chang et al. 2010; Delaney et al. 2011; Olivo et al. 2009), two very small RCTs comparing MBSR to wait-list control groups reported benefits in anxiety and emotion regulation and less use of reactive coping styles in MBSR participants (Robert McComb et al. 2004; Tacon et al. 2003).

Sullivan and colleagues conducted a novel prospective cohort study in which they geographically assigned 208 patients with chronic heart failure to either an MBI consisting of mindfulness meditation practice, coping skills, and group discussion for those who lived close enough to attend, or a usual care control condition for those living further away from the medical center (Sullivan et al. 2009). Patients in the MBI group had greater decreases in anxiety, depression, and cardiac symptoms post-intervention and at three and six months. However, after one year of follow-up, group differences were no longer apparent, as all participants showed increased symptoms. This pattern is similar to that seen in studies of other conditions, where MBSR provides an initial benefit that erodes somewhat over time. Again, home practice over the follow-up was not reported, but one speculation is that continued practice may be important in order to maintain psychological and physical benefits.

A recent RCT assigned 101 people with high BP to either MBSR or wait-list, and found no effect of the intervention on ambulatory BP (Blom et al. 2014). The only effect found in post-hoc analyses was a decrease in BP pre-to-post in female MBSR participants. Another RCT compared MBSR to progressive muscle relaxation (PMR) in 56 patients with prehypertension (Hughes et al. 2013). Patients randomized to MBSR had a 4.8 mmHg reduction in clinic systolic BP, compared to a 0.7 mmHg reduction in the PMR group, and a decrease in diastolic BP of 1.9 compared to 1.2 mmHg, but again no group difference in ambulatory BP values. This leaves the question of beneficial effects of MBIs on blood pressure equivocal. It may be the case that learning mindfulness helps in the clinic, but does not transfer to everyday life. For the moment, the question remains unresolved.

Diabetes

Diabetes impacts about 7% of the North American population, and is due to the body's inability to sufficiently produce and/or properly use insulin. It is characterized by symptoms of fatigue, lack of energy, frequent infections, easy bruising, tingling and pain in extremities, and weight changes (Public Health Agency of Canada 2012). A number of studies have been reported recently, many of which have monitored biomarkers as well as psychological functioning. Two earlier studies compared MBIs to educational control conditions in RCTs (Teixeira 2010) and reported greater improvements in QL related to pain and symptoms, adaptive coping, and better self-care behaviors in the MBI condition, as well as glycosylated hemoglobin (Hb) A1c values (a marker of blood glucose control) in the target range.

In a large ongoing study (Hartmann et al. 2012), 110 patients with type II diabetes were assigned to either MBSR or a usual care control condition. The MBSR participants improved more on overall health status, depression, and stress symptoms relative to controls after one year. Participants will be followed for a full five years post-treatment. Another large study compared MBCT to usual care in 139 diabetes patients (van Son et al. 2013) and found the intervention superior to control for decreasing stress, depressive symptoms, anxiety, and improving quality of life, but not on HbA1c.

A recent RCT evaluated a three-month mindful eating intervention compared to diabetes self-management in 52 patients (Miller et al. 2014), a much tougher test of differential efficacy against an active intervention group. Both groups improved over the course of six months on measures of depression, nutrition and eating-related self-efficacy, and cognitive control of eating, but the self-management group improved more on specific nutrition knowledge and self-efficacy, as well as fruit and vegetable consumption. The mindfulness group showed greater improvement on measures of mindfulness.

Thus, there is initial evidence that MBIs can be beneficial for improving psychological functioning and possibly improving glycemic control and helping with the neuropathy associated with type II diabetes. However, MBIs have only been shown to be superior to usual care or education control at this point, with the one study comparing an MBI to self-management showing few differential effects. Studies are still few in number and much more work needs to be done in this area.

HIV/AIDS

In 2010, 34 million people worldwide were reported to be living with HIV infections, which typically cause flu-like symptoms and put a person at risk of opportunistic infections (World Health Organization 2012). Untreated, HIV progresses to full-blown AIDS, characterized by symptoms such as fatigue, shortness of breath, fever, chronic cough, weight loss, and eventual death (World Health Organization 2012). MBSR research in this area has increased substantially in the last several years. For example, a 2012 RCT assessed the potential for MBSR to help patients cope with common side effects of antiretroviral medication, including gastrointestinal problems such as diarrhea, nausea, and vomiting, neuropathic pain, and dermatological problems including rashes (Duncan et al. 2012). Seventy-six people with HIV assigned to MBSR had fewer symptoms related to antiretroviral therapies at both post-program and six-month follow-up, as well as less symptom-related distress compared to wait-list control.

Some studies have also investigated the impact of MBSR on immune measures in HIV-positive participants. Two uncontrolled studies showed increases in CD4 T-cell lymphocyte numbers (Jam et al. 2010), and an increase in NK cell activity and quantity (Robinson et al. 2003), compared to patients who chose not to participate in MBSR.

Three RCTs have also been reported. Creswell and colleagues (2009) assigned 48 HIV-infected adults to either an eight-week MBSR class or a one-day stress reduction education seminar control condition. Peripheral counts of CD4 + T lymphocytes decreased substantially in the control group, but remained stable in the MBSR group. Those who attended more classes showed more stability in their CD4 lymphocytes, accounting for up to two-thirds of the effect on T-cell counts. In 40 HIV patients on long-term antiretroviral therapy assigned to either MBCT or usual care, large improvements in the MBCT group were seen on quality of life, stress, depression, anxiety, and CD4 + lymphocyte counts compared to control (Gonzalez-Garcia et al. 2014).

In the largest study, 173 Iranian HIV-positive patients not yet receiving antiretroviral therapy were randomized into either MBSR or a brief two-hour education support group (SeyedAlinaghi et al. 2012). In the MBSR condition,

the mean CD4 + lymphocyte count increased up to nine months post-treatment, then returned to baseline levels at 12 months. Control group counts remained relatively stable over the full year. Medical and psychiatric symptomatology improved in MBSR participants post-program, but only medical symptoms remained lower than controls over follow-up.

In sum, MBSR in HIV-infected patients may help to improve psychological well-being and symptom control, as well as improve measures of immune system functioning that are important predictors of disease progression compared to usual care. However, research has not used evidence-based active control groups matched on intervention duration or with CBT content, which might potentially have the same benefits.

Irritable bowel syndrome

Irritable bowel syndrome (IBS) is a functional disorder of the lower gastrointestinal tract defined by the presence of chronic or recurring symptoms that include abdominal pain, flatulence, bloating, and altered bowel habits (Drossman 1994). Prior to 2010 there were no reports in the literature on the application of MBIs for people with IBS, but since that time several research groups have reported large, well-designed RCTs. The first treatment results were published by Ljotsson and colleagues (2011a) in Sweden, who evaluated a ten-session group focusing on three themes: Cognitive awareness and education around stress and coping; mindfulness training; and exposure to noxious IBS symptoms. They conducted an RCT of an online adapted version of their acceptance and mindfulness-based intervention with 61 patients, compared to wait-list control. The intervention was conducted online largely by patients on their own at home, following a structured program of education and practice, and included weekly internet contact with therapists via e-mail. There was also a closed discussion forum for patients to share questions or progress with one another (Ljotsson et al. 2011a). Compared to those on the wait-list, participants improved more over time on IBS symptom severity, quality of life, and IBS-related fear and avoidance behaviors, and these improvements were maintained over 12 months.

This group continued investigating the online MBI against active controls, randomly assigning 86 patients to either the online acceptance and mindfulness intervention or an online discussion forum wait-list (Ljotsson et al. 2010). In this case, participants in the treatment condition reported a 42% decrease (compared to a 12% increase in the control group) in primary IBS symptoms, and they improved on GI-specific anxiety, depression, and general functioning with large effect sizes. These participants were followed-up 16 months later after they had all completed the intervention (Ljotsson et al. 2011c). Treatment gains

were maintained on all outcome measures, including IBS symptoms, quality of life, and anxiety related to gastrointestinal symptoms, again with large effect sizes (most d > 1.0).

Finally, in a large and well-designed RCT, this group investigated their online mindfulness intervention compared to online stress management matched in time and format with 195 patients, and also measured credibility of the treatments, expectancy for improvement, and therapeutic alliance (Ljotsson et al. 2011b). At post-treatment and six-month follow-up, the MBI group improved more than stress management controls on IBS symptom severity, IBS quality of life, visceral sensitivity, and the cognitive scale for functional bowel disorders. Both groups improved similarly on the perceived stress scale and hospital anxiety and depression scale subscales. There were also no group differences on the treatment credibility scale or the working alliance inventory. This impressive series of studies provides strong support for the efficacy of the online MBI for improving both physical symptoms and QL in IBS patients, but showed that other active interventions can also successfully treat stress, anxiety, and depression.

Two North American groups have also evaluated in-person traditional MBSR. In an RCT of MBSR versus wait-list for 90 IBS patients, Zernicke et al. (2012) showed that while both groups exhibited a decrease in IBS symptom severity scores over time, the improvement in the MBSR group was greater than the controls and was clinically meaningful, with symptom severity decreasing from constantly to occasionally present, which was maintained in the MBSR group six months later.

In an active comparison trial, 75 women with IBS were randomized to MBSR or a support group matched for time and other non-specific factors (Gaylord et al. 2011). Women in MBSR, compared to the support group, showed greater reductions in IBS symptom severity post-training (26.4% vs. 6.2% reduction) and at three-month follow-up (38.2% vs. 11.8%). Changes in quality of life, psychological distress, and visceral anxiety favoring MBSR emerged only at the three-month follow-up. Path analysis suggested that MBSR worked by promoting non-reactivity to gut-focused anxiety and less catastrophic appraisals of the significance of abdominal sensations, as well as refocusing attention onto interoceptive data without the high levels of emotional reactivity often characteristic of the disorder (E. L. Garland et al. 2011).

Considered together, this body of well-designed and executed studies provides consistent evidence for the efficacy of both in-person and online versions of MBIs for IBS sufferers, showing greater improvements specifically in IBS symptoms over other credible treatments, including stress management and social support.

Rheumatoid arthritis

There are two RCTs in this area, investigating the effect of MBSR on rheumatoid arthritis (RA), a painful autoimmune condition caused by swelling of the joints. In one (Pradhan et al. 2007), 63 participants were randomized to MBSR or a wait-list control. After two months, there were no differences between the groups on measures of depressive symptoms, psychological distress, well-being, mindfulness, and RA disease activity as evaluated by a physician masked to treatment status. However, at six months there were significant improvements across self-reported outcomes in the MBSR group.

The second study employed multimodal outcome measures and compared 144 participants randomly assigned to one of three conditions: CBT for pain; mindfulness meditation and emotion regulation therapy; or education-only (Zautra et al. 2008). The greatest improvements in pain control and reductions in inflammatory cytokines were observed in participants in the CBT pain group, but both the CBT and mindfulness groups improved more in coping efficacy than the education control group. Patients with a positive history of depression benefited more from mindfulness on outcomes of both negative and positive affect and physicians' ratings of joint tenderness, suggesting that MBSR might be preferable to CBT for treating individuals who struggle with depression; however, overall it did not prove to be a superior intervention.

In summary, the literature in this area is thin, but in controlled trials with active comparison groups, only with secondary analyses did outcomes emerge consistently favoring MBSR. For pain control itself, it may be the case that standard CBT is still the most effective treatment, whereas acceptance-based interventions may be more effective in increasing the ability to tolerate ongoing pain, and for people who struggle with depression in addition to pain.

Organ transplant

A series of well-designed studies was conducted by Gross and colleagues for patients who were recipients of organ transplants, who are often coping with a host of medical symptoms, side effects of anti-rejection drugs, and symptoms associated with recovery from complicated surgeries (Gross et al. 2004, 2010; Kreitzer et al. 2005). Pilot work with 19 kidney, lung, or pancreas transplant recipients showed improvement from baseline after MBSR on measures of depression and sleep, with the sleep effects maintained at three-month follow-up, when improvements in anxiety also became significant (Gross et al. 2004). At six months post-MBSR, continued improvements in sleep quality and duration as well as decreases in anxiety and depression were reported (Kreitzer et al. 2005). In a larger RCT, 138 recipients of kidney, kidney/pancreas, liver,

heart, or lung transplants were randomized to either MBSR or a health educa-tion control group (Gross et al. 2010). MBSR participants had greater reduc-tions in anxiety and sleep symptoms compared to the controls, with medium-sized effects up to one-year follow-up. Within the MBSR group, anxi-ety, depression, and sleep symptoms decreased and QL improved by eight weeks; these benefits were maintained at one year. Hence, this evidence sug-gests that MBSR is a specifically effective treatment for psychological symp-toms in organ transplant recipients.

Summary and future directions

This chapter began with a brief description of the experience of suffering chronic or acute illness, and how MBIs might help people in these circum-stances. This was followed by a review of quantitative research in the specific conditions with the most empirical evidence to support their efficacy, with an emphasis on newer RCTs. Generally, MBIs seem effective for short-term relief of many symptoms across conditions and for enhancing overall quality of life, but the longer-term effects are not yet well-studied, and there are suggestions that benefits erode over time without ongoing practice. However, some studies also found that benefits took time to accrue, not realizing the full value for symptom reduction until several months post-program. The timing, duration, and specificity of program effects have rarely been studied. Comparisons with active interventions, particularly CBT-based modalities, suggest that they may be comparable in some ways for outcomes such as pain control or insomnia treatment. More comparison trials with other active interventions would help to determine specificity of outcomes. Overall, the total number of studies is still small in many areas, with much more work to be done.

In terms of recommendations for research directions, continued compari-sons to gold-standard active interventions constitute more rigorous tests of the specificity of MBIs, and more of these are still needed. As seen in some pain studies in particular, and for treating insomnia in cancer, MBIs may not prove superior to other cognitive behavioral approaches. Non-specific factors such as group support, the therapeutic alliance, expectancy for improvement, psychoe-ducation, self-monitoring, and self-empowerment are likely also important drivers of change, as may be the specific targets of CBT: Altering dysfunctional thoughts and behaviors directly relating to the presenting problem.

In terms of understanding processes and mechanisms of change, we know that enhancing emotion regulation strategies such as decreasing worry and rumination, and the development of certain facets of mindfulness including non-judging and present-moment awareness, are important precursors to

improving symptomatology in medical patients. Further dismantling research evaluating other postulated mechanisms of change, processes of change, timing, and mediating factors would help improve our understanding of active ingredients within these complex multidimensional interventions.

Additionally, investigating the impact of patient preferences and treatment credibility on outcomes in RCTs would approximate more real-world scenarios wherein patients choose interventions of their liking that they think will work. Evidence suggests that increasing credibility of interventions may be important to harness expectancy effects. Utilizing pragmatic or preference-based trial designs, in which patients with a preference are assigned to their preferred intervention while those with no preference are randomized to one of two treatments, is an interesting way to investigate these influences.

Further pursuing this idea of individualizing or tailoring therapy, programs could also be tailored by determining goodness-of-fit or treatment matching, as not everyone benefits from mindfulness-based approaches, but we don't know what the specific predictors of benefit are. For example, some patients may benefit from CBT training first, followed by a mindfulness approach for maintenance of effects; others may do better with either CBT or mindfulness alone, but we don't know for whom to recommend which approach. Focus on tailoring interventions to individuals would also be helpful for potentially improving program retention and maximizing outcomes. Given that there is always attrition in MBIs, better understanding the motivations for taking programs, reasons for dropping out, and barriers to developing and maintaining home practice would be helpful—then identified barriers could potentially be addressed either programmatically or on a case-by-case basis. Further adapting MBIs to single-person interventions, home-study programs, internet-based programs, and shorter programs would also be beneficial to reach a larger number of underserved patients in rural and remote locations. Indeed, alternative formats and lengths have scarcely been investigated.

Finally, the principles of training facilitators who are grounded in mindfulness practice themselves and receive adequate training and supervision is widely considered to be essential, but little research has been conducted in this area. Studies should compare more to less experienced facilitators to empirically investigate this longstanding and deeply-held belief. If, as most clinicians believe, training and personal practice is essential in order to facilitate MBIs, this element is likely to be of increased importance as various MBI adaptations in form and delivery continue to evolve.

In summary, MBIs and other forms of meditation training hold great promise for helping people struggling with a wide range of physical health conditions. They have potential for not only alleviating suffering and managing difficult symptoms, but also for enhancing personal growth and helping people find

more meaning and purpose in life, despite the significant challenges posed by chronic and acute disease.

Personal Meditation Journey

I was first introduced to meditation as an actual practice (rather than just an idea I read about in books) during my first year of graduate school in clinical psychology at McGill University in Montreal, Canada, in the early 1990s. The great serendipity of that time was that one of my eight classmates was a "mature" student who had just returned from seven years sequestered as a monk in the Thai Forest Tradition of Theravadan Buddhism. He was so different from the rest of us—slow, quiet, thoughtful, and calm—and very interested and willing to teach anyone who wanted to learn. His teacher was the venerable Ajahn Chah, who directly taught my friend in the last years of his life. So he invited me and a few other interested students to sit with him on a weekly basis, a tradition we carried on throughout graduate school. At the same time, I was taking classes in Iyengar yoga twice a week from an experienced teacher and learning much about myself and the philosophy behind the various practices. I began attending *vipassana* retreats locally and around the country when possible. I'm sure this practice is what sustained me through the difficult years of completing a Ph.D., which was in the area of psychoneuroendocrinology (how hormones affect behavior and vice versa).

When it was time to complete my final year clinical internship, I returned to my home town of Calgary, Canada. One of the internship rotations was at the Tom Baker Cancer Centre, where my colleagues had just begun to put together a meditation and yoga program for the people we serve who are living with cancer. I was overjoyed to be able to apply what had become a central and very important part of my personal life to my professional work. We adapted the program over time and called it mindfulness-based cancer recovery. I focused my research career on evaluating this program, writing grants and research papers. In the last 15 years we've taught close to 2000 patients and support people in the eight-week group program and shown benefit across a wide range of outcomes.

In parallel, I was receiving training in the mindfulness-based stress reduction model from Jon Kabat-Zinn and Saki Santorelli at the University of Massachusetts Center for Mindfulness, and attending retreats and workshops through Spirit Rock Meditation Center and the Insight Meditation Society, among other more local offerings. I travelled to India to study yoga in an ashram, and to Burma to study with a *vipassana* nun. Throughout the first ten years of my career as a research scientist my practice was regular and strong; I felt it grew and deepened and enriched my life in many ways.

Then I had children. This has been the most challenging time in my practice (and in my life) as regular routines and patterns were suddenly obliterated and schedules revolved around the needs of my children. It took some time to re-establish a regular practice, and this continues to be a challenge with full-time work and raising two preschoolers. Fatigue is constant and getting up early in the morning to meditate no longer works. I had to move my practice to the evening after the kids are sleeping, and haven't attended a long retreat for over five years now. I still teach MBCR classes and this helps to keep me grounded in the practice and emphasizes its continued importance in my life and that of others. I know once my family grows up I will get back to attending longer retreats and more regular practice, but for now my challenge is mindful parenting. I try every day to be in the moment, with love and acceptance for my children, balancing this with necessary limits and boundaries. I feel this practice will stretch me in directions I need to grow in order to be there for my kids and the people I work with in a more accepting and compassionate manner.

Acknowledgments

References

American Cancer Society (2012). *Cancer facts and figures 2012*. Atlanta: American Cancer Society.

Armaiz-Pena, G.N., Lutgendorf, S.K., Cole, S.W., and Sood, A.K. (2009). Neuroendocrine modulation of cancer progression. *Brain, Behavior, and Immunity*, **23**(1), 10–15.

Blom, K., Baker, B., How, M. et al. (2014). Hypertension analysis of stress reduction using mindfulness meditation and yoga: Results from the harmony randomized controlled trial. *American Journal of Hypertension*, **27**(1), 122–129.

Boyle, P. and Levin, B. (2008). *World cancer report 2008*. Geneva: WHO Press.

Branstrom, R., Kvillemo, P., and Moskowitz, J.T. (2012). A randomized study of the effects of mindfulness training on psychological well-being and symptoms of stress in patients treated for cancer at 6-month follow-up. *International Journal of Behavioral Medicine*, **19**(4), 535–542.

Campbell, T.S., Labelle, L.E., Bacon, S.L. et al. (2012). Impact of mindfulness-based stress reduction (MBSR) on attention, rumination and resting blood pressure in women with cancer: A waitlist-controlled study. *Journal of Behavioral Medicine*, **35**(3), 262–271.

Carlson, L.E. (2012). Mindfulness-based interventions for physical conditions: A narrative review evaluating levels of evidence. *ISRN Psychiatry*, [Online], *2012*, 651583. Available at: http://dx.doi.org/10.5402/2012/651583

Carlson, L.E., Angen, M., Cullum, J. et al. (2004a). High levels of untreated distress and fatigue in cancer patients. *British Journal of Cancer*, **90**(12), 2297–2304.

Carlson, L.E., Beattie, T.L., Giese-Davis, J. et al. (2014a). Mindfulness-based cancer recovery (MBCR) and supportive expressive therapy (SET) maintain telomere length (TL) relative to control in distressed breast cancer survivors. *Cancer*, **121**(3), 476–484.

Carlson, L.E., Doll, R., Stephen, J. et al. (2013). Randomized controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy for distressed survivors of breast cancer (MINDSET). *Journal of Clinical Oncology*, **31**(25), 3119–3126.

Carlson, L.E., Speca, M., Patel, K.D., and Faris, P. (2007). One year pre-post intervention follow-up of psychological, immune, endocrine and blood pressure outcomes of mindfulness-based stress reduction (MBSR) in breast and prostate cancer outpatients. *Brain, Behavior, and Immunity*, **21**(8), 1038–1049.

Carlson, L.E., Speca, M., Patel, K.D., and Goodey, E. (2003). Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress, and immune parameters in breast and prostate cancer outpatients. *Psychosomatic Medicine*, **65**(4), 571–581.

Carlson, L.E., Speca, M., Patel, K.D., and Goodey, E. (2004b). Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress and levels of cortisol, dehydroepiandrosterone sulfate (DHEAS) and melatonin in breast and prostate cancer outpatients. *Psychoneuroendocrinology*, **29**(4), 448–474.

Carlson, L.E., Tamagawa, R., Stephen, J. et al. (2014b). Tailoring mind-body therapies to individual needs: Patients' program preference and psychological traits as moderators of the effects of Mindfulness-Based Cancer Recovery (MBCR) and Supportive Expressive Therapy (SET) in distressed breast cancer survivors. *Journal of the National Cancer Institute*, **2014**(50), 308–314.

Carlson, L.E., Tamagawa, R., Stephen, J. et al. (2015). Randomized-controlled trial of Mindfulness-Based Cancer Recovery (MBCR) versus Supportive Expressive Group Therapy (SET) among Distressed Breast Cancer Survivors (MINDSET): Long-term follow-up results. *Psycho-Oncology*, under review.

Carlson, L.E., Ursuliak, Z., Goodey, E. et al. (2001). The effects of a mindfulness meditation based stress reduction program on mood and symptoms of stress in cancer outpatients: Six month follow-up. *Supportive Care in Cancer*, **9**, 112–123.

Chang, B.H., Casey, A., Dusek, J.A., and Benson, H. (2010). Relaxation response and spirituality: Pathways to improve psychological outcomes in cardiac rehabilitation. *Journal of Psychosomatic Research*, **69**(2), 93–100.

Chiesa, A. and Serretti, A. (2011). Mindfulness-based interventions for chronic pain: A systematic review of the evidence. *Journal of Alternative and Complementary Medicine*, **17**(1), 83–93.

Classen, C.C., Kraemer, H.C., Blasey, C. et al. (2008). Supportive-expressive group therapy for primary breast cancer patients: A randomized prospective multicenter trial. *Psycho-oncology*, **17**(5), 438–447.

Cramer, H., Lauche, R., Paul, A., and Dobos, G. (2012). Mindfulness-based stress reduction for breast cancer—a systematic review and meta-analysis. *Current Oncology*, **19**(5), e343–e352.

Creswell, J.D., Myers, H.F., Cole, S.W., and Irwin, M.R. (2009). Mindfulness meditation training effects on CD4 + T lymphocytes in HIV-1 infected adults: A small randomized controlled trial. *Brain, Behavior, and Immunity*, **23**(2), 184–188.

Delaney, C., Barrere, C., and Helming, M. (2011). The influence of a spirituality-based intervention on quality of life, depression, and anxiety in community-dwelling adults with cardiovascular disease: A pilot study. *Journal of Holistic Nursing*, **29**(1), 21–32.

Drossman, D.A. (1994). Irritable bowel syndrome. *The Gastroenterologist*, **2**(4), 315–326.

Duncan, L.G., Moskowitz, J.T., Neilands, T.B. et al. (2012). Mindfulness-based stress reduction for HIV treatment side effects: A randomized, wait-list controlled trial. *Journal of Pain and Symptom Management*, **43**(2), 161–171.

Elabd, S. (2011). Mindful meditation for chronic pain sufferers may have positive effect. *Topics in Pain Management*, **27**(4), 9. doi:10.1097/01.TPM.0000407595.13435.bd

Fjorback, L.O., Arendt, M., Ornbol, E. et al. (2013). Mindfulness therapy for somatization disorder and functional somatic syndromes: Randomized trial with one-year follow-up. *Journal of Psychosomatic Research*, **74**(1), 31–40.

Foley, E., Baillie, A., Huxter, M. et al. (2010). Mindfulness-based cognitive therapy for individuals whose lives have been affected by cancer: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, **78**(1), 72–79.

Garland, E.L., Gaylord, S.A., Palsson, O. et al. (2011). Therapeutic mechanisms of a mindfulness-based treatment for IBS: Effects on visceral sensitivity, catastrophizing, and affective processing of pain sensations. *Journal of Behavioral Medicine*, **35**(6), 591–602.

Garland, E.L., Manusov, E.G., Froeliger, B. et al. (2014). Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of Consulting and Clinical Psychology*, **82**(3), 448–459.

Garland, S.N., Carlson, L.E., Antle, M.C. et al. (2011). I-CAN SLEEP: Rationale and design of a non-inferiority RCT of Mindfulness-based Stress Reduction and Cognitive Behavioral Therapy for the treatment of Insomnia in CANcer survivors. *Contemporary Clinical Trials*, **32**(5), 747–754.

Garland, S.N., Carlson, L.E., Stephens, A.J. et al. (2014). Mindfulness-Based Stress Reduction compared with Cognitive Behavioral Therapy for the treatment of insomnia comorbid with cancer: A randomized, partially blinded, noninferiority trial. *Journal of Clinical Oncology*, **32**(5), 449–457.

Gaylord, S.A., Palsson, O.S., Garland, E.L. et al. (2011). Mindfulness training reduces the severity of irritable bowel syndrome in women: Results of a randomized controlled trial. *The American Journal of Gastroenterology*, **106**(9), 1678–1688.

Goldenberg, D.L., Kaplin, K.H., Nadeau, M.G. et al. (1994). A controlled study of a stress-reduction, cognitive-behavioral treatment program in fibromyalgia. *Journal of Musculoskeletal Pain*, **2**(2), 53–66.

Gonzalez-Garcia, M., Ferrer, M.J., Borras, X. et al. (2014). Effectiveness of mindfulness-based cognitive therapy on the quality of life, emotional status, and CD4 cell count of patients aging with HIV infection. *AIDS and Behavior*, **18**(4), 676–685.

Gross, C.R., Kreitzer, M.J., Russas, V. et al. (2004). Mindfulness meditation to reduce symptoms after organ transplant: A pilot study. *Advances in Mind-Body Medicine*, **20**, 20–29.

Gross, C.R., Kreitzer, M.J., Thomas, W. et al. (2010). Mindfulness-based stress reduction for solid organ transplant recipients: A randomized controlled trial. *Alternative Therapies in Health and Medicine*, **16**(5), 30–38.

Grossman, P., Tiefenthaler-Gilmer, U., Raysz, A., and Kesper, U. (2007). Mindfulness training as an intervention for fibromyalgia: Evidence of postintervention and 3-year follow-up benefits in well-being. *Psychotherapy and Psychosomatics*, **76**(4), 226–233.

Hartmann, M., Kopf, S., Kircher, C. et al. (2012). Sustained effects of a mindfulness-based stress-reduction intervention in type 2 diabetic patients: Design and first results of a randomized controlled trial (The Heidelberger Diabetes and Stress-Study). *Diabetes Care*, **35**(5), 945–947.

Henderson, V.P., Clemow, L., Massion, A.O. et al. (2012). The effects of mindfulness-based stress reduction on psychosocial outcomes and quality of life in early-stage breast cancer patients: A randomized trial. *Breast Cancer Research and Treatment*, **131**(1), 99–109.

Hoffman, C.J., Ersser, S.J., Hopkinson, J.B. et al. (2012). Effectiveness of mindfulness-based stress reduction in mood, breast- and endocrine-related quality of life, and well-being in Stage 0 to III breast cancer: A randomized, controlled trial. *Journal of Clinical Oncology*, **30**(12), 1335–1342.

Hughes, J.W., Fresco, D.M., Myerscough, R. et al. (2013). Randomized controlled trial of mindfulness-based stress reduction for prehypertension. *Psychosomatic Medicine*, **75**(8), 721–728.

Jam, S., Imani, A.H., Foroughi, M. et al. (2010). The effects of a mindfulness-based stress reduction (MBSR) program in Iranian HIV/AIDS patients: A pilot study. *Acta Medica Iranica*, **48**(2), 101–106.

Jensen, M.P., Day, M.A., and Miro, J. (2014). Neuromodulatory treatments for chronic pain: Efficacy and mechanisms. *Nature Reviews Neurology*, **10**(3), 167–178.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry*, **4**, 33–47.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. New York, NY: Delacourt.

Kreitzer, M.J., Gross, C.R., Ye, X. et al. (2005). Longitudinal impact of mindfulness meditation on illness burden in solid-organ transplant recipients. *Progress in Transplantation*, **15**(2), 166–172.

Lamanque, P. and Daneault, S. (2006). Does meditation improve the quality of life for patients living with cancer? *Canadian Family Physician*, **52**, 474–475.

Lauche, R., Cramer, H., Dobos, G. et al. (2013). A systematic review and meta-analysis of mindfulness-based stress reduction for the fibromyalgia syndrome. *Journal of Psychosomatic Research*, **75**(6), 500–510.

Ledesma, D. and Kumano, H. (2009). Mindfulness-based stress reduction and cancer: A meta-analysis. *Psycho-oncology*, **18**(6),571–579.

Lengacher, C.A., Johnson-Mallard, V., Post-White, J. et al. (2009). Randomized controlled trial of mindfulness-based stress reduction (MBSR) for survivors of breast cancer. *Psycho-oncology*, **18**(12), 1261–1272.

Lengacher, C.A., Kip, K.E., Barta, M.K. et al. (2012). A pilot study evaluating the effect of mindfulness-based stress reduction on psychological status, physical status, salivary cortisol, and interleukin-6 among advanced-stage cancer patients and their caregivers. *Journal of Holistic Nursing*, 30(3), 170–185.

Lengacher, C.A., Kip, K.E., Post-White, J. et al. (2011). Lymphocyte recovery after breast cancer treatment and mindfulness-based stress reduction (MBSR) therapy. *Biological Research for Nursing*, **15**(1), 37–47.

Ljotsson, B., Andersson, G., Andersson, E. et al. (2011a). Acceptability, effectiveness, and cost-effectiveness of internet-based exposure treatment for irritable bowel syndrome in a clinical sample: A randomized controlled trial. *BMC Gastroenterology*, **11**, 110.

Ljotsson, B., Falk, L., Vesterlund, A.W. et al. (2010). Internet-delivered exposure and mindfulness based therapy for irritable bowel syndrome—a randomized controlled trial. *Behaviour Research and Therapy*, **48**(6), 531–539.

Ljotsson, B., Hedman, E., Andersson, E. et al. (2011b). Internet-delivered exposure-based treatment vs. stress management for irritable bowel syndrome: A randomized trial. *The American Journal of Gastroenterology*, **106**(8), 1481–1491.

Ljotsson, B., Hedman, E., Lindfors, P. et al. (2011c). Long-term follow-up of internet-delivered exposure and mindfulness based treatment for irritable bowel syndrome. *Behaviour Research and Therapy*, **49**(1), 58–61.

Mackenzie, M.J., Carlson, L.E., Munoz, M., and Speca, M. (2007). A qualitative study of self-perceived effects of Mindfulness-based Stress Reduction (MBSR) in a psychosocial oncology setting. *Stress and Health*, **23**(1), 59–69.

Matchim, Y. and Armer, J.M. (2007). Measuring the psychological impact of mindfulness meditation on health among patients with cancer: A literature review. *Oncology Nursing Forum*, **34**(5), 1059–1066.

Matchim, Y., Armer, J.M., and Stewart, B.R. (2011). Mindfulness-based stress reduction among breast cancer survivors: A literature review and discussion. *Oncology Nursing Forum*, **38**(2), E61–671.

McCracken, L.M. and Thompson, M. (2011). Psychological advances in chronic pain: A concise selective review of research from 2010. *Current Opinion in Supportive and Palliative Care*, **5**(2), 122–126.

Miller, C.K., Kristeller, J.L., Headings, A., and Nagaraja, H. (2014). Comparison of a mindful eating intervention to a diabetes self-management intervention among adults with type 2 diabetes: A randomized controlled trial. *Health Education and Behavior*, 41(2), 145–154.

Monti, D.A., Kash, K.M., Kunkel, E.J. et al. (2013). Psychosocial benefits of a novel mindfulness intervention versus standard support in distressed women with breast cancer. *Psycho-oncology*, **22**(11), 2565–2575.

Musial, F., Bussing, A., Heusser, P. et al. (2011). Mindfulness-based stress reduction for integrative cancer care: A summary of evidence. *Forschende Komplementarmedizin*, **18**(4), 192–202.

Olivo, E.L., Dodson-Lavelle, B., Wren, A. et al. (2009). Feasibility and effectiveness of a brief meditation-based stress management intervention for patients diagnosed with or at risk for coronary heart disease: A pilot study. *Psychology, Health and Medicine*, **14**(5), 513–523.

Ospina, M.B., Bond, T.K., Karkhaneh, M. et al. (2007). *Meditation practices for health: State of the research*. Rockville, MD: Agency for Healthcare Research and Quality.

Ospina, M. and Harstall, C. (2002). *Prevalence of chronic pain: An overview*. Alberta: Alberta Heritage Foundation for Medical Research.

Patil, S.G. (2009). Effectiveness of mindfulness meditation (Vipassana) in the management of chronic low back pain. *Indian Journal of Anaesthesia*, **53**(2), 158–163.

Piet, J. and Hougaard, E. (2011). The effect of mindfulness-based cognitive therapy for prevention of relapse in recurrent major depressive disorder: A systematic review and meta-analysis. *Clinical Psychology Review*, **31**(6), 1032–1040.

Piet, J., Wurtzen, H., and Zachariae, R. (2012). The effect of mindfulness-based therapy on symptoms of anxiety and depression in adult cancer patients and survivors: A systematic review and meta-analysis. *Journal of Consulting and Clinical Psychology*, **80**(6), 1007–1020.

Plews-Ogan, M., Owens, J.E., Goodman, M. et al. (2005). A pilot study evaluating mindfulness-based stress reduction and massage for the management of chronic pain. *Journal of General Internal Medicine*, **20**(12), 1136–1138.

Pradhan, E.K., Baumgarten, M., Langenberg, P. et al. (2007). Effect of Mindfulness-Based Stress Reduction in rheumatoid arthritis patients. *Arthritis and Rheumatism*, **57**(7), 1134–1142.

Public Health Agency of Canada (2012). Diabetes. [Online] Available at: http://www.phac-aspc.gc.ca/cd-mc/diabetes-diabete/index-eng.php [Accessed October 15, 2012].

Robert McComb, J.J., Tacon, A., Randolph, P., and Caldera, Y. (2004). A pilot study to examine the effects of a mindfulness-based stress-reduction and relaxation program on levels of stress hormones, physical functioning, and submaximal exercise responses. *Journal of Alternative and Complementary Medicine*, **10**(5), 819–827.

Robinson, F.P., Mathews, H.L., and Witek-Janusek, L. (2003). Psycho-endocrine-immune response to mindfulness-based stress reduction in individuals infected with the human immunodeficiency virus: A quasiexperimental study. *Journal of Alternative and Complementary Medicine*, **9**, 683–694.

Schmidt, S., Grossman, P., Schwarzer, B. et al. (2011). Treating fibromyalgia with mindfulness-based stress reduction: Results from a 3-armed randomized controlled trial. *Pain*, **152**(2), 361–369.

Schneider, R.H., Alexander, C.N., Staggers, F. et al. (2005). Long-term effects of stress reduction on mortality in persons > or = 55 years of age with systemic hypertension. *The American Journal of Cardiology*, **95**, 1060–1064.

Segal, Z.V., Williams, M.G., and Teasdale, J.D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.

Sephton, S.E., Sapolsky, R.M., Kraemer, H.C., and Spiegel, D. (2000). Diurnal cortisol rhythm as a predictor of breast cancer survival. *Journal of the National Cancer Institute*, **92**(12), 994–1000.

SeyedAlinaghi, S., Jam, S., Foroughi, M. et al. (2012). Randomized controlled trial of mindfulness-based stress reduction delivered to human immunodeficiency virus-positive patients in Iran: Effects on CD4(+) T lymphocyte count and medical and psychological symptoms. *Psychosomatic Medicine*, **74**(6), 620–627.

Shapiro, S.L. and Carlson, L.E. (2009). *The art and science of mindfulness: Integrating mindfulness into psychology and the helping professions*. Washington, DC: American Psychological Association Publications.

Shennan, C., Payne, S., and Fenlon, D. (2011). What is the evidence for the use of mindfulness-based interventions in cancer care? A review. *Psycho-oncology*, **20**(7), 681–697.

Speca, M., Carlson, L.E., Goodey, E., and Angen, M. (2000). A randomized, wait-list controlled clinical trial: The effect of a mindfulness meditation-based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine*, **62**(5), 613–622.

Sullivan, M.J., Wood, L., Terry, J. et al. (2009). The Support, Education, and Research in Chronic Heart Failure Study (SEARCH): A mindfulness-based psychoeducational intervention improves depression and clinical symptoms in patients with chronic heart failure. *American Heart Journal*, **157**(1), 84–90.

Tacon, A.M., McComb, J., Caldera, Y., and Randolph, P. (2003). Mindfulness meditation, anxiety reduction, and heart disease: A pilot study. *Family and Community Health*, **26**, 25–33.

Teixeira, E. (2010). The effect of mindfulness meditation on painful diabetic peripheral neuropathy in adults older than 50 years. *Holistic Nursing Practice*, **24**(5), 277–283.

van Son, J., Nyklicek, I., Pop, V.J. et al. (2013). The effects of a mindfulness-based intervention on emotional distress, quality of life, and HbA(1c) in outpatients with diabetes (DiaMind): A randomized controlled trial. *Diabetes Care*, **36**(4), 823–830.

Veehof, M.M., Oskam, M.J., Schreurs, K.M., and Bohlmeijer, E.T. (2011). Acceptance-based interventions for the treatment of chronic pain: A systematic review and meta-analysis. *Pain*, **152**(3), 533–542.

Weissbecker, I., Salmon, P., Studts, J.L. et al. (2002). Mindfulness-based stress reduction and sense of coherence among women with fibromyalgia. *Journal of Clinical Psychology in Medical Settings*, **9**, 297–307.

Witek-Janusek, L., Albuquerque, K., Chroniak, K.R. et al. (2008). Effect of mindfulness based stress reduction on immune function, quality of life and coping in women newly diagnosed with early stage breast cancer. *Brain, Behavior, and Immunity*, **22**(6), 969–981.

Witek-Janusek, L., Gabram, S., and Mathews, H.L. (2006). Psychologic stress, reduced NK cell activity, and cytokine dysregulation in women experiencing diagnostic breast biopsy. *Psychoneuroendocrinology*, **32**(1), 22–35.

Wong, S.Y., Chan, F.W., Wong, R.L. et al. (2011). Comparing the effectiveness of mindfulness-based stress reduction and multidisciplinary intervention programs for chronic pain: A randomized comparative trial. *The Clinical Journal of Pain*, **27**(8), 724–734.

World Health Organization (2012). *Global health observatory data repository*. [Online] Available at: http://apps.who.int/ghodata/ [Accessed October 15, 2012].

Zainal, N. Z., Booth, S., and Huppert, F.A. (2013). The efficacy of mindfulness-based stress reduction on mental health of breast cancer patients: A meta-analysis. *Psycho-oncology*, **22**(7), 1457–1465.

Zautra, A.J., Davis, M.C., Reich, J.W. et al. (2008). Comparison of cognitive behavioral and mindfulness meditation interventions on adaptation to rheumatoid arthritis for patients with and without history of recurrent depression. *Journal of Consulting and Clinical Psychology*, **76**(3), 408–421.

Zernicke, K.A., Campbell, T.S., Blustein, P.K. et al. (2012). Mindfulness-Based Stress Reduction for the treatment of irritable bowel syndrome symptoms: A randomized wait-list controlled trial. *International Journal of Behavioral Medicine*, **20**(3), 385–396.

Zernicke, K.A., Campbell, T. S., Speca, M. et al. (2013). The eCALM Trial-eTherapy for cancer appLying mindfulness: Online mindfulness-based cancer recovery program for underserved individuals living with cancer in Alberta: Protocol development for a randomized wait-list controlled clinical trial. *BMC Complementary and Alternative Medicine*, **13**, 34. doi:10.1186/1472-6882-13-34

Zernicke, K.A., Campbell, T.S., Speca, M. et al. (2014). Randomized wait-list controlled eCALM trial: Feasibility and initial efficacy of an online mindfulness-based cancer recovery program for underserved adults. *Psychosomatic Medicine*, **76**(4), 257–267.

Chapter 10

The cognitive and affective neurosciences of meditation

Antonino Raffone

Introduction

Meditation can be conceptualized as a family of practices regulating cognition and emotion, in which mental and related somatic events are influenced by a specific directing of attention and awareness. As promulgated in several contemplative traditions, mental training based on meditation leads to enhanced cognitive and emotional regulation, and to mental states characterized by reduced negative emotions and motives, and enhanced positive features and attitudes such as serenity, joy, acceptance, and compassion.

More recently many scientific and clinical studies have provided evidence of the beneficial effects of meditation on cognition, emotion, and health. Such studies have developed considerably over recent years as a result of several factors, including the availability of new research techniques, such as neuroimaging. The involvement in meditation research of leading laboratories in cognitive and affective neuroscience, such as the Laboratory for Affective Neuroscience led by Richard Davidson in Wisconsin, has also played an important role. Also, the interest of His Holiness the Dalai Lama in science and its dialogue with Buddhism has stimulated research on meditation and related aspects of contemplative practice. Other influential authors, such as Daniel Goleman, who has co-authored books with the Dalai Lama on negative (Goleman and Dalai Lama 2003) and wholesome emotions, have contributed to the diffusion of interest in meditation and contemplative practices in the West. The mindfulness-based protocols resulting from the mindfulness-based stress reduction (MBSR) program developed by Jon Kabat-Zinn (e.g., Kabat-Zinn 1990, 2003) have led to a number of clinical, psychological, and neuroscientific studies on meditation practices in the context of such protocols.

The training of attention is a central feature of different meditation methods (Davidson and Goleman 1977). Indeed, several studies have reported the development of more efficient attentional processes with meditation practice,

including increased attentional control and sustained attention (e.g., Slagter et al. 2007; van den Hurk et al. 2010 for a review see Lutz et al. 2008a). More generally, a number of recent behavioral, electroencephalographic (EEG), and neuroimaging studies have revealed the importance of investigating states and traits related to meditation to achieve an increased understanding of cognitive and affective plasticity (and related neuroplasticity), attention, and awareness (Cahn and Polich 2006; Lutz et al. 2008a; Raffone and Srinivasan 2010). Clinical applications are also increasingly recognized (Cahn and Polich 2006; Hofmann et al. 2010; van Aalderen et al. 2012).

In this chapter I will provide an overview of the neural correlates of meditation, and will then focus on neuroplasticity as related to meditation-based mental training. Attention will be given to the two main facets of meditation, focused attention (related to "concentration") and open monitoring (related to "mindfulness"), which are highlighted in scientific research, with related neuroscientific findings.

An overview of the neural correlates of meditation

A key question in relation to the neural correlates of meditation is whether there is a single area or only a few areas of the brain crucially involved in meditation experiences, associated with attention, awareness, and compassion (localistic view), or whether there is a large-scale brain activity pattern (holistic view) involved in meditation. Several findings about the neural correlates of meditation (Lutz et al. 2007, 2008b; Manna et al. 2010; Raffone and Srinivasan 2010) suggest a "middle way" as the most plausible response to such a question, which goes beyond the dichotomy of localistic and holistic views. Indeed, it seems plausible that meditation leads to changes in activity and structure of specific sets of interacting brain areas, in terms of networks or functional systems, rather than of a single key area or a large, undifferentiated set of brain regions. In particular, it seems that meditation influences brain networks involved in cognitive control and conscious access (e.g., Raffone and Srinivasan 2009), feeling and emotional awareness (e.g., Craig 2009; Lutz et al. 2008b), and processing related to the self (e.g., Pagnoni et al. 2008).

Another question is whether such neural activities and structures involve more "archaic" brain regions, such as those of the limbic system connected to emotions and body regulation, or whether more cognitive and "refined" areas acquired more recently in evolution, such as the prefrontal cortex, are involved. The latter, more than any other brain regions, differentiate *Homo sapiens* from other species, and can be related to fluid intelligence, planning, and cognitive control. Furthermore, one may wonder whether meditation affects "deep" regions of the brain, for more basal functions, such as thalamic nuclei or brain

stem structures involved in regulating vigilance and the sleep-wake cycle, and whether there is a larger involvement of the right brain hemisphere or of the left hemisphere in meditation. There might also be interest in which brain rhythms (electroencephalographic or EEG) are mainly involved in meditation, such as the alpha or theta rhythms. Finally, one may wonder whether there are universal neural correlates for all types of meditation, or whether there are specific correlates of each type or form of meditation. Below I will attempt to provide tentative answers to such challenging questions based on neuroscientific findings.

A panoramic overview of neuroscientific studies of meditation suggests that attention ("concentration") and awareness (mindfulness) during meditation are associated with a set of areas at different functional levels in the brain, at both cortical and subcortical levels. These include sensory areas such as the somatosensory cortex and posterior insula, which are involved in processing different types of body inputs, such as those related to touch, pain, and the so-called interoception, that is sensory inputs from the inside of the body such as visceral inputs (e.g., Craig 2009). Areas implicated in rapid emotional responses, such as the amygdala, can also be associated with meditation states and meditation-based mental training (Hoelzel et al. 2011; Lutz et al. 2008b). The amygdala is an area of the so-called limbic system for emotional coloring of perceptual and memory inputs linked to the survival of the organism, and is over-activated in stress and anxiety, and altered in mood disorders. Remarkably it has been found that meditation (mindfulness) based training does not only change the function (activity) of the amygdala, but also its structure (Hoelzel et al. 2011).

Meditation-based mental training also influences areas linked to episodic memory, such as the hippocampus, and thus not only responses to perceptual inputs. In particular it reduces the occurrence of over-general memories in autobiographical retrieval. This influence therefore increases the specificity and vividness of autobiographical memory, such as in depression, which is often characterized by over-general memories (e.g., Williams et al. 2000).

Areas linked to the control of attention and cognitive processing, such as the anterior cingulate cortex and dorsolateral prefrontal cortex, are also markedly associated to meditation states and traits (Cahn and Polich 2006; Raffone and Srinivasan 2009). These areas are involved in several aspects of cognitive functioning, including the control of attention and conscious access to perceptual information, as well as in so-called cognitive flexibility, i.e. the ability to respond to stimuli in flexible ways depending on the current task context and demand (Moore and Malinowski 2009). Meditation-related brain regions also include those associated with monitoring and stimulus-independent thinking, such as the anterior prefrontal cortex, the brain region that more than any other differentiates *Homo sapiens* from other animals (including primates), and other areas

linked to body (interoceptive) awareness, feelings, and mental states, such as the anterior insula (in particular in the right hemisphere) (see Hoelzel et al. 2011; Lazar et al. 2005; Lutz et al. 2008b; Manna et al. 2010; Siegel 2007).

Moreover, several studies suggest that meditation and mindfulness modulate the brain network involved in self-representation and self-referential processing, the so-called "default mode network" (Raichle et al. 2001). In other words, meditation affects those areas of the brain that are responsible for shaping our experience of "self" and our thinking about this "self." This network also appears to be involved in mind wandering during resting and task performance, in self-projection in the past and in the future, and in several types of identifications linked to one's own mental processes and representations of the mental states of others. It is not by chance that mindfulness meditation makes the operation of such a network more flexible and regulated, and reduces the conditioning of mind wandering on cognition, mood, and mental states, as well as the identification with mental processes and aspects of the flow of experience (Dor-Ziderman et al. 2013; Pagnoni et al. 2008). Therefore, meditation appears to change not only brain responses to stimuli, but also the intrinsic or spontaneous activity of the brain during wakefulness. More research needs to be conducted to explore whether spontaneous mentation and brain activity during dreams is also affected by meditation training.

In sum, neuroscientific findings suggest that meditation enhances the abilities of cognitive and affective regulation, strengthening the ability to regulate dysfunctional mental states and conditioning such as stress, anxiety, and negative mood. And, in more subtle ways, meditation regulates processes of identification and attachment. Such neuroscientific outcomes are consistent with results from several studies into the clinical effectiveness of mindfulness-based programs for stress and anxiety reduction, for preventing relapse into depression (through mindfulness-based cognitive therapy—MBCT—Segal et al. 2002), and in focused applications such as for treatment of eating disorders, addictions, and post-traumatic stress disorder (see Keng et al. 2011).

It is also remarkable that meditative practices appear to be linked to brain areas that are involved in the different functions of cognitive, affective, and body state regulation. Such areas can be regarded as interfaces between emotion and cognition, and between the regulation of mental and body states. In particular, such areas include the anterior cingulate cortex and the anterior insula, both regions that were acquired remotely in evolution, but with important re-adaptations in humans. For example, in humans such areas incorporate the so-called von Economo neurons, which are capable of establishing long-range connections in the brain and can thus mediate influences of emotions, motives, and mental states over long distances in the brain, such as related to consciousness and decision making.

According to the perspectives of influential researchers (Allman et al. 2001; Craig 2009), such neurons play a key role in mediating the influences of mental states on thoughts and actions: for example, the influence of negative and unwholesome mental states such as anger. In other words, meditation and mindfulness might be expected to influence the ability to reduce the impact of anger by regulating the "broadcasting" of anger-related signals in the brain. In combination with reducing the influence of negative mental states on consciousness, positive mental states generated with meditation, such as serenity and joy, may spontaneously broadcast in the brain and thus reduce mind wandering and support sustained attention, receptive awareness, and meditative insight. Interestingly, such neurons appear altered in autistic people (Allman et al. 2005), who often have heightened anxiety, and can also be found, though in less refined patterns, in other species that display refined social interactions, such as other superior primates, dolphins, and elephants (e.g., Butti et al. 2009; Hakeem et al. 2009; Nimchinsky et al. 1999). In this respect, it is noteworthy that such species are capable of mirror self-recognition, suggesting some enhanced self-awareness in comparison with other species.

Thus, it seems that such key areas, which provide interfaces between mind and body, and emotion and cognition, and mediate the influence of mental states on thinking, consciousness, and action, are modified by meditation. For example, a recent study (Hasenkamp et al. 2012) has shown that such areas are activated when there is awareness of distraction during meditation, while other areas, such as the dorsolateral prefrontal cortex, are activated in the process of refocusing and sustaining attention on the intended meditation object.

Moreover, both the anterior insula and anterior cingulate cortex are involved in pain experience, particularly in the subjective or secondary aspect of pain experience (Baliki et al. 2009; Vogt and Sikes 2000). Other regions, such as the somatosensory cortex and posterior insula, are involved in the direct (primary) sensory experience of pain, and others, such as the amygdala, in the unpleasant feeling of the pain experience. In a recent study (Zeidan et al. 2011) it was found that a meditative exercise focused on breathing (for 20 minutes per day for four days) led to modified activities of the anterior insula and the anterior cingulate cortex, as related to subjective reports of the pain experience. However, the responses of brain areas associated with the sensory experience of pain were not modified. This is consistent with the accounts of meditators managing pain described by Vidyamala Burch in Chapter 7 of this volume.

These findings help to counteract a common and inappropriate stereotype about meditation: that it is a means for withdrawal, isolation, abstraction, or anesthesia from the surrounding world. Rather, the neuroscientific evidence suggests that meditation changes the interpretation of sensory inputs, which

are, however, openly received in the field of perceptual awareness, rather than being gated (except for visual inputs when meditating with closed eyes). In the same vein, it has been found that compassion meditation does not lead to a suppression of sensory inputs related to the pain of another person, but rather intensifies them, while activating higher-level areas related to empathy and emotion sharing (which is different from emotional contagion) (Lutz et al. 2008b). Remarkably, such areas include the anterior insula, which also appears to be a key brain area linked to mindfulness (see also Lazar et al. 2005).

This research suggests that brain areas that are plausible substrates of mindfulness are also implicated in empathy and compassion. Such evidence is consistent with the suggestion that the ability to connect and understand our own emotions and mental states, which is developed through mindfulness (insight) meditation, is related to the ability to empathize with others. Psychotherapy research suggests that therapist difficulty in seeing and recognizing their own emotions and experiences makes it difficult for them to recognize the same emotions and experiences in others (e.g., patients) (Stedmon and Dallos 2009).

Now we turn to the question of whether meditation practice is associated with hemispheric lateralization of brain activity patterns. Even though the function of sustained attention in meditation appears linked to the right brain hemisphere, neuroscientific findings show the involvement of both hemispheres in meditation, although not necessarily with a bilateral involvement of the different regions. Such involvement also depends on the specific task, subjects, and type of meditation (e.g., see Cahn and Polich 2006; Lutz et al. 2008a).

Finally, regarding the brain rhythms related to meditation, taking together different studies it seems that multiple rhythms can be related to meditation states and traits, including the so-called "slow" delta, alpha, and theta rhythms and the "fast" beta and gamma rhythms. Again, this depends on the tasks, subjects (their expertise), forms of meditation, and observed brain regions (see, for example, Cahn and Polich 2006).

Meditation and neuroplasticity

The Buddha's teachings emphasized that the mind can be modified in a positive way via meditation practice, and current research has also described meditation as *mental training*. Such training might be expected to lead to long-term changes in brain structure and function. Indeed, researchers have suggested that *neuroplasticity*—structural and functional changes at different levels in the brain—is an outcome of meditative states and meditation practice (e.g., Lutz et al. 2007, 2008a).

One key research question is how much meditation practice it takes to observe changes in brain activities and structures. A number of neuroscience studies suggest that functional and structural changes in the brain linked to meditation can take place on several time-scales. Indeed, one study showed meditation-related changes in brain activity after just four days of meditation practice (with 20 minutes of practice per day) (Zeidan et al. 2011). Another study found that just five days of meditation practice (20 minutes per day) led to enhancements of attentional control and immune responses, and a reduction in stress responses (Tang et al. 2007). Other studies (e.g., Farb et al. 2007; Moore and Malinowski 2009; Segal 2002) show pronounced changes in cognitive and emotion regulation processes and related brain activity patterns after eight weeks of meditation training using mindfulness protocols (e.g., MBSR and MBCT). Another study also found that after eight weeks of meditation training there were structural changes in the meditators' brains, as well as changes in brain activity patterns (Hoelzel et al. 2011). On a longer time-scale, Slagter et al. (2007) found pronounced changes in attentional and conscious access processes and related neural activities among a sample of meditators participating in a retreat lasting three months, with meditation practice for eight hours per day on average (Slagter et al. 2007).

There are also studies showing pronounced differences in brain activity patterns when meditation practitioners with an average of about 16,000 hours of meditation practice are compared with practitioners with an average of about 44,000 hours of meditation practice (Brefczynski-Lewis et al. 2007). Moreover, multiple studies highlight differences in cognitive processes (e.g., attentional networks) between people who undertook eight weeks of mindfulness-based training and people who were long-term insight (*vipassana*) Buddhist meditators (Jha et al. 2007; van den Hurk et al. 2010).

Studies such as that carried out by Lutz et al. (2004) have shown that brain activity patterns, such as brain rhythms in key areas of the cerebral cortex, appear to change as a function of both meditation expertise (traits) and specific meditation states. These studies confirm that meditation practice leads to stable changes in certain brain activities (e.g., brain rhythms) related to awareness and compassion, outside meditation practice ("off the cushion") (e.g., Lutz et al. 2004). Such experimental findings suggest that beneficial changes related to meditation, such as calmness, awareness, acceptance, and compassion, are not limited to the periods of meditation practice (e.g., sitting meditation) but are extended into daily life. Reciprocally, in terms of the same neural processes, it is plausible to assume that positive mental states developed in daily life, through the process of developing (informal) awareness, wisdom, and compassion (loving kindness) practice, reverberate positively in formal meditation practice.

Meditation practice appears also to counteract brain ageing processes. For example, a study by Lazar et al. (2005) found a reduced loss of cortical thickness (which depends on the number of neurons and their harborizations in the cortical layers) with ageing in long-term *vipassana* (insight) meditators in several brain areas involved in cognitive control and emotion regulation, such as the anterior prefrontal cortex and the anterior insula. Such findings suggest that meditation alleviates the effects of cognitive and brain ageing by plausibly enhancing the functioning of cortical circuits and reducing the loss of neurons and synapses with ageing. Following such findings, it also appears important to assess to what extent meditation and mindfulness practices can be protective in respect to dementias in ageing.

Therefore, meditation training appears to influence several important aspects of mind, brain, and behavior, with differential effects depending on meditation expertise. The next section will characterize meditation states and traits in terms of two main categories suitable for psychological and neuroscientific research.

The two facets of meditation in neuroscientific studies: focused attention and open monitoring

The term meditation refers to a relatively large family of practices linked to different traditions and contexts. For the purposes of research, which demands a precise reference to the objects of investigation, meditation practices can be classified into two main styles—*focused attention* (FA) and *open monitoring* (OM)—depending on how the attentional processes are directed (Cahn and Polich 2006; Lutz et al. 2008a; but see Travis and Shear 2010 for a different perspective). In the FA ("concentrative") style, attention is focused on a given object in a sustained manner. The second style, OM meditation, involves the non-reactive monitoring of the contents of ongoing experience, primarily as a means to become reflectively aware of the nature of emotional and cognitive patterns. Given their importance in current research on meditation, in this section we first describe FA meditation, and then OM meditation, and then discuss how focused attention and open monitoring can also be practiced in the same meditation context and understood in a unitary manner.

Focused attention meditation

In FA meditation practice, high attentional stability and vividness (acuity) are achieved in a mental state of concentrated calm or serene attention, denoted by the word *samatha* (with the literal meaning of *quiescence*) in the Buddhist contemplative tradition (Wallace 1999). By using a telescope analogy, Wallace

(1999) observed that in FA or *samatha* meditation, the development of attentional stability may be likened to mounting a telescope on a firm platform, while the development of attentional vividness is like polishing the lenses and bringing the telescope into clear focus.

Apart from sustaining attentional focus on an intended object, FA meditation also involves the regulative skills of monitoring the focus of attention, detecting distraction, disengaging attention from the source of distraction, and refocusing on the object (Lutz et al. 2008a). FA meditation techniques involve observing the experiential field by allowing thoughts and sensations to arise and pass without clinging to them, and maintaining attention on an object or bringing it back to the specific object of focused attention, in order to develop an internal "witnessing observer" (Cahn and Polich 2006). The attentional and monitoring functions of FA meditation have been related to different systems in the brain involved in attentional control and in selective and sustained attention (Lutz et al. 2008a; see also Weissman et al. 2006). The neural correlates of such different FA meditation functions have recently been described by a functional magnetic resonance imaging (fMRI) study conducted by Hasenkamp et al. (2012). This study elegantly identified different brain regions involved in mind wandering (distraction), awareness of distraction, shifting back to the meditation object, and then sustaining focus on it.

Srinivasan and Baijal (2007) reported changes in automatic sensory processing at early stages (before the intervention of attention) due to concentration (FA) meditation. Frequent and infrequent auditory tones were presented to meditators before meditation and while exiting meditation, and to a control group who practiced relaxation. The results showed increases in brain waves ("mismatch negativity" amplitudes) immediately after and before meditation, indicating enhanced sensitivity of the perceptual system of the meditators at early sensory processing stages, even before attention could be allocated for a cognitive task. Changes in perceptual processes have also been shown in a study of expert meditators (Tibetan Buddhist monks) who could sustain a perceptual state (motion-induced blindness) for a significantly longer period in an FA meditation state (Carter et al. 2005). The study also reported longer durations with a binocular rivalry task, in which conflicting inputs are presented to the two eyes (with uncontrolled switches between the two in perceptual awareness in general participants), indicating possible changes in the brain mechanisms responsible for perceptual awareness, as a state effect of FA meditation based on (trait) meditation expertise (Carter et al. 2005).

In addition to enhancement of perceptual processing, meditation practice is associated with changes in attentional processes dependent on the nature of the meditation practice (Baijal et al. 2011). A study with children who practiced

transcendental meditation showed that not all attentional processes benefited from increased practice and expertise (Baijal et al. 2011). More specifically, they investigated alerting (the ability to enhance attention by an external trigger), orienting (the ability to direct attention to a cued location), and conflict monitoring (the ability to prevent interference from a distracter flanker) using the Attention Network Test (ANT). While conflict monitoring and alerting performance was different between meditators and controls, there was no difference in orienting. The results also showed that those practicing transcendental meditation were better able to handle conflict trials that were followed by non-conflict trials, indicating a benefit in reactive control mechanisms.

An fMRI study with practitioners of FA meditation showed lower activation in regions related to distraction and task-unrelated thoughts compared to controls during a task that required the observers to ignore auditory stimuli (Brefczynski-Lewis et al. 2007). Practice of FA meditation appeared to result in enhanced ability to focus attention, thereby reducing the effects of irrelevant stimuli. During FA meditation compared to rest, there was activation in multiple regions associated with monitoring and engagement of attention (such as dorsolateral prefrontal cortex, visual cortex, and superior frontal and intraparietal sulci). Interestingly, the strength of activity in these regions showed an inverted *u*-shaped curve with meditation. Meditators with moderate experience showed stronger activation but very experienced meditators showed less activation. The *u*-shaped pattern of brain activity suggests that, with very extensive mental training such as the practice of FA meditation, minimal effort might be necessary to sustain the focus of attention.

We will now focus on OM meditation, which unlike FA meditation does not involve focusing on a specific meditation object, such as breath sensations linked to an area of the body. OM meditation just involves a receptive awareness of the fields of experience in the present moment, without an explicit focus or sustaining attention onto any perceptual, feeling, or thought content.

Open monitoring meditation

Lutz et al. (2008a) suggest that OM meditation can strengthen regulatory influences on emotional processes, through prefrontal regulation of limbic responses. Indeed, neuroimaging studies have shown that simple verbal labeling of affective stimuli leads to the activation of the (right) ventrolateral prefrontal cortex, and to reduced responses of the amygdala through ventromedial prefrontal cortex activity (Hariri et al. 2000; Lieberman et al. 2007). This strategy of labeling aspects of experience (e.g., "this is unpleasant") is used in *vipassana* (or insight) meditation, for example, and nurtures a more detached awareness of affective content in moment-to-moment experience.

In OM meditation, monitoring is reflected in the capacity to notice arising sensory, feeling, and thought events in the present moment within an unrestricted receptive awareness. In the transition from an FA to an OM meditative state, which may for example take place after some minutes in a meditation sitting, the object as the primary focus is gradually replaced by a sustaining of an open awareness (Lutz et al. 2008a). Behavioral studies of OM meditators have shown a more distributed attentional focus (Valentine and Sweet 1999), enhanced conflict monitoring (Tang et al. 2007), and reduced attentional blink or more efficient resource allocation to serially-presented targets (Slagter et al. 2007).

Lutz et al. (2004) found a high-amplitude pattern of synchrony in the gamma oscillatory band in expert meditators during an emotional version of OM meditation (non-referential compassion or loving kindness meditation). In that study, compared with a group of novices, the practitioners (with a mental training of 10,000 to 50,000 hours over time periods ranging from 15 to 40 years) self-induced higher-amplitude sustained gamma band oscillations and long-range phase synchrony, especially over lateral frontoparietal electrodes, during meditation. This pattern of gamma band oscillations and synchrony was also significantly more pronounced in the baseline state of the long-term practitioners compared with the novices, thus suggesting a neuroplasticity-based transformation in the default brain mode of the practitioners.

Therefore, mental training based on both FA and OM meditation leads to changes of brain activity that can be observed both as trait-related (off the cushion) and as related to meditation states (during or immediately after meditation), though with remarkable differences in brain activity patterns for FA and OM meditation. We will now focus on the possible complementarity of FA and OM meditation within a unitary meditation practice, i.e. by regarding FA and OM facets of meditation as two aspects that can be expressed in alternation within the same meditation sitting.

Focused attention and open monitoring in a unitary view of meditation

Attentional stability and vividness (acuity), as developed in FA meditation, are regarded as necessary for deep and reliable introspection to take place in meditation, as in the practice of *vipassana* (insight) meditation. Tsongkhapa (1357–1419), an eminent Tibetan Buddhist contemplative and philosopher, uses an analogy to highlight the importance of attentional stability and vividness for the cultivation of contemplative insight (see Wallace 1999). If an oil-lamp that is both radiant and unflickering is used at night to light a hanging tapestry, the depicted forms can be vividly observed. By contrast, if the oil-lamp is dim, or even if it is bright but then flickers due to the wind, the depicted images cannot

be seen. Thus, both stability of attentional focusing and the temporal resolution (acuity) of attention and consciousness linked to such focus play a crucial role in meditation.

It has to be noted that the witnessing observer or meta-awareness function plays a key role in *both* FA and OM meditation forms. Such a function is also related to the well-known notion of mindfulness, generally defined as focusing one's attention in a non-judgmental or accepting way on the experience occurring in the present moment (e.g., Brown et al. 2007; Kabat-Zinn 1990). Indeed, it is possible to be mindfully aware of all that is currently salient and, simultaneously, to be mindful of something in particular by focusing attention toward a stimulus or phenomenon (Kornfield 1993). For example, we can focus attention on a given object (the breath) and be reflectively mindful of such focus and any distracting phenomena (sounds, thoughts, physical sensations).

Thus, in several meditation practices, FA and OM styles can be seen as simply two sides of the same coin, as in Buddhist insight meditation (e.g., Khantipalo 1984). Chiesa (2012) notes ". . . concentrative and mindfulness meditation practices are no longer described as opposed processes. Instead, several authors recognize that they usually share a common background of focused attention (concentration), which can take different directions depending on the specific meditation form . . . While the former primarily concerns the stability of the meditative state, the latter concerns the specific phenomenological 'angle' from which the receptive field can be observed" (p. 3). However, other meditation practices, such as non-referential open presence meditation, do not involve focused attention on an object (see Lutz et al. 2007 for a review on different forms of Buddhist meditation). These observations thus pose constraints for a rigid distinction between FA and OM meditation in psychological and neuro-scientific research. Meditation training that emphasizes focused attention has been found to improve attentional orienting (Jha et al. 2007; van der Hurk et al. 2009), as well as conflict monitoring (Tang et al. 2007; van der Hurk et al. 2009). In contrast, meditation training that emphasizes open monitoring improves the alerting network as measured using the Attention Network Test (see Jha et al. 2007).

A study of *vipassana* (insight) meditation entailing FA and OM facets investigated the phenomenon of attentional blink (AB); that is, poor identification of the second of two targets (T1 and T2) amongst a stream of stimuli presented rapidly one after another. *Vipassana* meditators showed a reduced AB, indicating efficient distribution of their limited attentional resources (Slagter et al. 2007). The *vipassana* meditators may have gained better control over the allocation of attention by reducing the resources devoted to processing the first (T1) target (also suggested by a reduced amplitude of a specific brain wave

linked to T1, the P3b amplitude), such that the subsequent target was more often detected (or reduced AB).

In a related study (Slagter et al. 2009) with the same participants, EEG spectral analyses showed that intensive mental training in the form of *vipassana* meditation was associated with decreased cross-trial variability in the phase of oscillatory theta activity after successfully detected T2s, in particular for those individuals who showed the greatest reduction in brain resource allocation to T1. This finding suggests theta phase locking in conscious target perception, which in turn suggests that after meditation-based mental training, the cognitive system is more rapidly available to process new target information.

In another investigation, Lutz et al. (2009) found a reduced variability in attentional processing of target tones after intensive FA/OM meditation training, as shown by both enhanced theta-band phase consistency of oscillatory neural responses over anterior brain areas and reduced reaction-time variability. Moreover, those participants who showed the greatest increase in neural response consistency showed the largest decrease in behavioral response variability. Taken together, these findings suggest that linked to neuroplasticity, key brain activity (oscillatory) patterns become more coherent with intensive meditation and may thus enable a more efficient transmission of signals over long distances in the brain, such as for access of perceptual information to consciousness.

Conclusions and research directions

As discussed in this chapter, an increasing number of neuroscientific, psychological, and clinical findings show the effectiveness of meditation practice in supporting mental and physical health, as well as for improving a set of attentional processes, cognitive flexibility, cognitive monitoring, and emotion regulation, and enhancing mental states of empathy and compassion. Research has also shown that meditation-based mental training leads to changes in the function and structure of several brain areas and systems at different levels, and that different aspects of meditation are plausibly related to different components of brain structure and processes, as also related to meditation expertise.

However, several neurocognitive and neuroaffective processes need to be clarified in further investigations. For example, the neural correlates of different facets of consciousness need to be clarified in meditation settings. In particular, there might be involvement of highly-trained meditators ("virtuosos") capable of switching between different attentional and awareness modes, with attention to (awareness of) external sensory fields or internal

(thought- and feeling-related) fields of experience, by using the neurophenomenology approach (Lutz and Thompson 2003; Varela 1996). In the neurophenomenological approach, quantitative measures of neural activity are combined with first-person data about the subject's inner experience. Participants' reports can thus be useful in identifying variability in brain activity from moment to moment; this unique information might guide the detection and interpretation of neural processes correlated to different aspects of conscious experience. Novel techniques for EEG analysis might be fruitfully applied in that framework (Fingelkurts and Fingelkurts 2006; Thompson and Varela 2001).

In further studies it would be insightful to compare brain activity patterns in OM meditation conditions with differential awareness of fields of experience, such as body sensory fields, external sensory fields, and "internal" thoughts and feelings. Moreover, it appears useful to design an experiment comparing brain activity patterns in FA meditation with a focus on breathing-related sensations and on an external visual point. Indeed, somewhat different brain activity patterns have been observed in expert FA meditators with the focus on an external visual point (Brefczynski-Lewis et al. 2007) and on breathing sensations (Manna et al. 2010).

Also, an increased scientific understanding of compassion (loving kindness) meditation and related brain circuitries is important in light of relevant relationships with empathy and theory of mind (Lutz et al. 2008b) and clinical implications of compassion-based mental training (Gilbert 2009). It also appears relevant to integrate such an understanding with knowledge about the mechanisms of focused attention, monitoring, and awareness investigated in other forms of meditation. Moreover, it appears interesting to investigate whether and how meditation traits influence sleep and dreaming, and how these measures relate to mindfulness, mental states, and relevant psychological dispositions.

Large-scale computational models with biological and cognitive constraints can shed further light on the neural mechanisms of attention and consciousness implicated in meditation. In particular, earlier neurocomputational models of conscious processing (e.g., Dehaene et al. 2003; Raffone and Pantani 2010) might be usefully adapted to simulate plausible neural mechanisms for focused attention and cognitive monitoring in meditation, including meditation expertise-related effects, and could possibly lead to novel testable predictions. Finally, further neuroscientific studies may shed more light on whether or not different forms of meditation involve the same brain structures, processes, mechanisms, and expertise-related structural and functional changes.

Personal Meditation Journey

I started meditation practice in 2004 in England under the guidance of Prof. Peter Harvey, with a *samatha* Buddhist meditation style. Such practice, in combination with *Dhamma* teachings, was deeply transformative in my life, bringing a deeper meaning of existence and leading to the enhancement of awareness, wholesome mental states and attitudes, and important insights about conditioning of the mind. It also had positive reverberations in my relationships with others, such as in terms of more mindful, patient, kind, and compassionate dispositions in the family and at work.

From the end of 2005 I started practice in the Arco Soto Zen Center in Rome, under the guidance of Ven. Dario Doshin Girolami, and received a lay ordination (Bodhisattva vows) in this context in 2009. I also assist Prof. Henk Barendregt in *vipassana* (insight) meditation retreats taking place every year near Rome, with a duration up to 15 days. I practice meditation daily (with a 40-minute Zazen meditation sitting in the early morning), with an intensive practice every Sunday (up to seven 40-minute sittings), and promote the practice of meditation and related research in several contexts, including university (such as in the form of weekly seminars led by qualified meditation teachers) and prison (in collaboration with Ven. Dario Doshin Girolami) contexts.

I have recently founded (with others) the "Consciousness, Mindfulness, Compassion—CMC—International Association," of which I am currently Chair, promoting interdisciplinary research on consciousness, mindfulness, and empathy, as well as practice of meditation, mindfulness, and compassion in several clinical and societal contexts. I have also recently founded and currently direct the Master's in "Mindfulness: Practice, clinical applications and neuroscience" at the Sapienza University of Rome.

References

Allman, J. M., Hakeem, A., Erwin, J. M. et al. (2001). The anterior cingulate cortex: The evolution of an interface between emotion and cognition. *Annual New York Academy of Science*, **935**, 107–117.

Allman, J. M., Watson, K. K., Tetreault, N. A., and Hakeem, A. J. (2005). Intuition and autism: A possible role for Von Economo neurons. *Trends in Cognitive Sciences*, **9**, 367–373.

Baijal, S., Jha, A., Kiyonaga, A. et al. (2011). The influence of concentrative meditation training on the development of attention networks in early adolescence. *Frontiers in Psychology*, **2**, 153.

Baliki, M. N., Geha, P. Y., and Apkarian, A. V. (2009). Parsing pain perception between nociceptive representation and magnitude estimation. *Journal of Neurophysiology*, **101**, 875–887.

Brefczynski-Lewis, J. A., Lutz, A., Schaefer, H. S. et al. (2007). Neural correlates of attentional expertise in long-term meditation practitioners. *Proceedings of the National Academy of Sciences, USA*, **104**, 11483–11488.

Brown, K. W., Ryan, R. M., and Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, **18**, 211–237.

Butti, C., Sherwood, C. C., Hakeem, A. Y. et al. (2009). Total number and volume of Von Economo neurons in the cerebral cortex of cetaceans. *The Journal of Comparative Neurology*, **515**, 243–259.

Cahn, B. R. and Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, **132**, 180–211.

Carter, O. L., Presti, D. E., Callistemon, C. et al. (2005). Meditation alters perceptual rivalry in Tibetan Buddhist monks. *Current Biology*, **15**, R412–R413.

Chiesa, A. (2012). The difficulty of defining mindfulness: Current thought and critical issues. *Mindfulness*, **4**(3), 255–268. doi:10.1007/s12671–12012–01231–4.

Craig, A. D. (2009). How do you feel—now? The anterior insula and human awareness. *Nature Reviews Neuroscience*, **10**, 59–70.

Davidson, R. J. and Goleman, D. J. (1977). The role of attention in meditation and hypnosis: A psychobiological perspective on transformations of consciousness. *International Journal of Clinical and Experimental Hypnosis*, **25**(4), 291–308.

Dehaene, S., Sergent, C., and Changeux, J. P. (2003). A neuronal network model linking subjective reports and objective physiological data during conscious perception. *Proceedings of the National Academy of Sciences USA*, **100**, 8520–8525.

Dor-Ziderman, Y., Berkovich-Ohana, A., Glicksohn, J., and Goldstein, A. (2013). Mindfulness-induced selflessness: A MEG neurophenomenological study. *Frontiers in Human Neuroscience*, **7**, 582.

Farb, N. A. S., Segal, Z. V., Mayberg, H. et al. (2007). Attending to the present: Meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience*, **2**, 313–322.

Fingelkurts, A. A. and Fingelkurts, A. A. (2006). Timing in cognition and EEG brain dynamics: Discreteness versus continuity. *Cognitive Processing*, **7**, 135–162.

Gilbert, P. (2009). Introducing compassion-focused therapy. *Advances in Psychiatric Treatment*, **15**, 199–208.

Goleman, D. and Dalai Lama (2003). *Destructive emotions: A scientific dialogue with the Dalai Lama*. New York, NY: Bantam Books.

Hakeem, A. Y., Sherwood, C. C., Bonar, C. J. et al. (2009). Von Economo neurons in the elephant brain. *The Anatomical Record*, **292**, 242–248.

Hariri, A. R., Bookheimer, S. Y., and Mazziotta, J. C. (2000). Modulating emotional responses: Effects of a neocortical network on the limbic system. *Neuroreport*, **11**, 43–48.

Hasenkamp, W., Wilson-Mendenhall, C. D., Duncan, E., and Barsalou, L. W. (2012). Mind wandering and attention during focused meditation: A fine-grained temporal analysis of fluctuating cognitive states. *NeuroImage*, **59**, 750–760.

Hoelzel, B. K., Carmody, J., Evans, K. C. et al. (2011). Stress reduction correlates with structural changes in the amygdala. *Social Cognitive and Affective Neuroscience*, **5**, 11–17.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., and Oh, D. (2010). The effects of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, **78**, 169–183.

Jha, A. P., Krompinger, J., and Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective and Behavioral Neuroscience*, **7**, 109–119.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain and illness*. New York, NY: Delacourt.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, **10**, 144–156.

Keng, S. L., Smoski, M. J., and Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, **31**, 1041–1056.

Khantipalo, B. (1984). *Calm and insight: A Buddhist manual for meditators*. London and Dublin: Curzon Press Ltd.

Kornfield, J. (1993). *A path with heart*. New York, NY: Bantam.

Lazar, S. W., Kerr, C. E., Wasserman, R. H. et al. (2005). Meditation experience is associated with increased cortical thickness. *Neuroreport*, **16**, 1893–1897.

Lieberman, M. D., Eisenberger, N. I., Crockett, M. J. et al. (2007). Putting feelings into words: Affect labeling disrupts amygdala activity in response to affective stimuli. *Psychological Science*, **18**, 421–428.

Lutz, A., Brefczynski-Lewis, J., Johnstone, T., and Davidson, R. J. (2008b). Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PLoS ONE*, **3**, e1897.

Lutz, A., Dunne, J. D., and Davidson, R. J. (2007). Meditation and the neuroscience of consciousness: An introduction. In P. Zelazo, M. Moscovitch, and E. Thompson (Eds.). *Cambridge Handbook of Consciousness*. New York, NY: Cambridge University Press.

Lutz, A., Greischar, L., Rawlings, N. B. et al. (2004). Long-term meditators self-induce high-amplitude synchrony during mental practice. *Proceedings of the National Academy of Sciences*, **101**, 16369–16373.

Lutz, A., Slagter, H. A., Dunne, J. D., and Davidson, R. J. (2008a). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, **12**, 163–169.

Lutz, A., Slagter, H. A., Rawlings, N. B. et al. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *The Journal of Neuroscience*, **29**(42), 13418–13427.

Lutz, A. and Thompson, E. (2003). Neurophenomenology: Integrating subjective experience and brain dynamics in the neuroscience of consciousness. *Journal of Consciousness Studies*, **10**, 31–52.

Manna, A., Raffone, A., Perrucci, M. G. et al. (2010). Neural correlates of focused attention and cognitive monitoring in meditation. *Brain Research Bulletin*, **82**, 46–56.

Moore, A. and Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition*, **18**, 176–186.

Nimchinsky, E. A., Gilissen, E., Allman, J. M. et al. (1999). A neuronal morphologic type unique to humans and great apes. *Proceedings of the National Academy of Sciences USA*, **96**, 5268–5273.

Pagnoni, G., Cekic, M., and Guo, Y. (2008). "Thinking about not-thinking": Neural correlates of conceptual processing during Zen meditation. *PLoS ONE*, **3**(9): e3083.

Raffone, A. and Pantani, M. (2010). A global workspace model for phenomenal and access consciousness. *Consciousness and Cognition*, **19**, 580–596.

Raffone, A. and Srinivasan, N. (2009). An adaptive workspace hypothesis about the neural correlates of consciousness: Insights from neuroscience and meditation studies. In N. Srinivasan (Ed.). *Progress in brain research: Attention*, pp. 161–180. Amsterdam: Elsevier.

Raffone, A. and Srinivasan, N. (2010). The exploration of meditation in the neuroscience of meditation and consciousness. *Cognitive Processing*, **11**, 1–7.

Raichle, M. E., MacLeod, A. M., Snyder, A. Z. et al. (2001). A default mode of brain function. *Proceedings of the National Academy of Sciences USA*, **98**, 676–682.

Segal, Z. V., Williams, J. M. G., and Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford.

Siegel, D. J. (2007). *The mindful brain*. New York, NY: Norton.

Slagter, H. A., Lutz, A., Greischar, L. L. et al. (2007). Mental training affects distribution of limited brain resources. *PLoS Biology*, **5**, e138.

Slagter, H. A., Lutz, A., Greischar, L. L. et al. (2009). Theta phase synchrony and conscious target perception: Impact of intensive mental training. *Journal of Cognitive Neuroscience*, **21**(8), 1536–1549.

Srinivasan, N. and Baijal, S. (2007). Concentrative meditation enhances pre-attentive processing: A mismatch negativity study. *Neuroreport*, **18**, 1709–1712.

Stedmon, J. and Dallos, R. (2009). *Reflective practice in psychotherapy and counselling*. Maidenhead, UK: McGraw-Hill Education.

Tang, Y. Y., Ma, Y., Wang, J. et al. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences USA*, **104**, 17152–17156.

Thompson, E. and Varela, F. (2001). Radical embodiment: Neural dynamics and consciousness. *Trends in Cognitive Sciences*, **5**, 418–425.

Travis, F. and Shear, J. (2010). Focused attention, open monitoring and automatic self-transcending: Categories to organize meditations from Vedic, Buddhist and Chinese traditions. *Consciousness and Cognition*, **19**, 1110–1118.

Valentine, E. R. and Sweet, P. L. G. (1999). Meditation and attention: A comparison of the effects of concentrative and mindfulness meditation on sustained attention. *Mental Health, Religion and Culture*, **2**, 59–70.

van Aalderen, J. R., Donders, A. R., Giommi, F. et al. (2012). The efficacy of mindfulness-based cognitive therapy in recurrent depressed patients with and without a current depressive episode: A randomized controlled trial. *Psychological Medicine*, **42**(5), 989–1001.

van den Hurk, P. A. M., Giommi, F., Gielen, S. C. et al. (2010). Greater efficiency in attentional processing related to mindfulness meditation. *The Quarterly Journal of Experimental Psychology*, **63**, 1168–1180.

Varela, F. (1996). Neurophenomenology: A methodological remedy to the hard problem. *Journal of Consciousness Studies*, **3**, 330–350.

Vogt, B. A. and Sikes, R. W. (2000). The medial pain system, cingulate cortex, and parallel processing of nociceptive information. *Progress in Brain Research*, **122**, 223–235.

Wallace, A. (1999). The Buddhist tradition of *Samatha*: Methods for refining and examining consciousness. *Journal of Consciousness Studies*, **6**, 175–187.

Weissman, D. H., Roberts, K. C., Visscher, K. M., and Woldorff, M. G. (2006). The neural bases of momentary lapses in attention. *Nature Neuroscience*, **9**, 971–978.

Williams, J. M., Teasdale, J. D., Segal, Z. V., and Soulsby, J. (2000). Mindfulness-based cognitive therapy reduces overgeneral autobiographical memory in formerly depressed patients. *Journal of Abnormal Psychology*, **109**, 150–155.

Zeidan, F., Martucci, K. T., Kraft, R. A. et al. (2011). Brain mechanisms supporting the modulation of pain by mindfulness meditation. *The Journal of Neuroscience*, **31**, 5540–5548.

Part 3

Meditation in workplaces and schools

Chapter 11

Mindfulness and meditation in the workplace: An acceptance and commitment therapy approach

Frank W. Bond, Paul E. Flaxman, and Joda Lloyd

Introduction

There is a wide-ranging and growing body of evidence that mental health and behavioral effectiveness are influenced more by how people interact with their thoughts and feelings than by their form (e.g., how negative they are) or frequency. Research has demonstrated this key finding in a wide range of areas. For example, in chronic pain, psychosocial disability is predicted more by the experiential avoidance of pain than by the degree of pain (McCracken 1998). A number of therapeutic approaches have been developed that share this key insight: Distress tolerance (e.g., Brown et al. 2002; Schmidt et al. 2007), thought suppression (e.g., Wenzlaff and Wegner 2000), and mindfulness (Baer 2003). It is also central to a number of the newer contextual cognitive behavior therapy (CBT) approaches to treatment, such as mindfulness-based cognitive therapy (MBCT; Segal et al. 2002), dialectical behavior therapy (DBT; Linehan 1993), metacognitive therapy (Wells 2011), and acceptance and commitment therapy (ACT; Hayes et al. 1999).

The purpose of this chapter is to describe how ACT conceptualizes mindfulness and tries to enhance it in the pursuit of promoting mental health and behavioral effectiveness (e.g., productivity at work). To this end, we discuss ACT's key construct of psychological flexibility, which involves mindfulness, and how it has led to a somewhat different approach not only to conceptualizing mindfulness, but also to how we try to enhance it in the workplace. In so doing, we hope to show that whilst formal meditation practice is valued in ACT, it is only one strategy that is used to promote mindfulness, as well as psychological flexibility more generally.

ACT hypothesizes that psychological flexibility[1] is a primary determinant of mental health and behavioral effectiveness. It refers to the ability to fully contact the present moment and the thoughts, feelings, memories, and physiological sensations it contains without needless defense or avoidance and, depending upon what the situation affords, persisting or changing behavior in the pursuit of goals and values (Hayes et al. 2006).

A key implication of this concept—and hence its name—is that, in any given situation, people need to be flexible as to the extent to which they base their actions on their internal events (e.g., thoughts, feelings, memories, and physiological sensations) or the contingencies of reinforcement (or punishment) that are present in that situation. ACT maintains, and research suggests, that people are more psychologically healthy and perform more effectively when they base their actions on their own values and goals (Bond et al. 2011). Thus, if a person values being a caring friend, she may broach a difficult topic, even if doing so is anxiety provoking; in another situation, however, she might refrain from mentioning something, even if she strongly feels like doing so, in order to pursue her personally meaningful goal of being a caring friend. In short, when people are psychologically flexible, they base their behavior, in any given situation, more on their values and goals and less on their ever-changeable internal events or current situational contingencies (Bond et al. 2011).

An implication of acting flexibly is that people will experience, at times, unwanted psychological events (e.g., anxiety) whilst pursuing their values-based goals. Thus, a great deal of ACT theory and practice emphasizes the use of *mindfulness* strategies for experiencing these events, so that they have less of a negative impact on individuals' psychological health and their ability to pursue their values-based goals. When people are mindful of their psychological events, they deliberately observe them on a moment-to-moment basis, in a non-elaborative, open, curious, and non-judgmental manner (Brown and Ryan 2003; Kabat-Zinn 1990; Linehan 1993; Marlatt and Kristeller 1999). Thus, psychological flexibility emphasizes both committed action toward meaningful goals and mindfulness. It is this combination of mutually enhancing processes that is likely to account for the many mental health and performance benefits associated with this individual characteristic (see Bond et al. 2011, 2013; in prep.; and Hayes et al. 2006 for reviews).

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[1] For historical reasons, psychological flexibility has also been referred to as psychological acceptance, and psychological inflexibility has been referred to as experiential avoidance. Bond et al. (2011) discuss these reasons.

Psychological flexibility and ACT at work

Psychological flexibility, and its promotion through ACT, has been primarily discussed in terms of mental health (see Hayes and Strosahl 2004; Hayes et al. 2006); however, the implication that flexibility may help people to be sensitive to, and contact, contingencies of reinforcement that bear on chosen values makes its usefulness to the work setting clear. If people value doing well at work (even if it is just to get paid), greater psychological flexibility increases their sensitivity to performance-related contingencies of reinforcement in their work environment (Bond et al. 2006). This is because people who are more flexible are more mindful and, as a result, are not expending their limited attentional resources in trying to change, control, or otherwise avoid their internal events; as a result, they are better able to notice and respond effectively to those performance-related contingencies that exist in their current environment. Put more succinctly, this context sensitivity hypothesis states that, in the context of work, flexibility allows people to learn how to do their job more successfully and to have better mental health (in particular, through greater and more mindful contact with values-centered contingencies of positive reinforcement) (Bond et al. 2006).

In the workplace, research has shown that higher levels of psychological flexibility correlate with, and longitudinally predict, multiple work-related outcomes, including better mental health, better job performance, and an increased capacity to learn skills at work (Bond and Bunce 2003; Bond and Flaxman 2006; Bond et al. in prep.; Hayes et al. 2006). In some instances, these effects have been found even after controlling for other widely researched, work-relevant, individual characteristics, such as negative affectivity and locus of control (Bond and Bunce 2003), emotional intelligence (Donaldson-Feilder and Bond 2004), and the Big Five personality traits (Bond et al. 2013).

Research has also indicated that people with greater levels of psychological flexibility better utilize beneficial resources within their work environments. Bond et al. (2008) found, using mediated moderation analyses, that higher levels of psychological flexibility enhanced the beneficial impact of a work reorganization intervention designed to improve job control. Specifically, people with higher levels of flexibility perceived that they had greater levels of job control as a result of the intervention, and this perception of higher levels of control allowed these people to experience greater improvements in mental health and absence levels (as recorded by the company's Human Resources department). Consistent with the goal-related context-sensitivity hypothesis, the authors suggested that psychological flexibility helped people in the intervention group to better notice where, when, and the degree to which they had increased levels of control; they

also maintained that it helped participants to better recognize goal-related opportunities for putting that control to effective use (Bond et al. 2008).

Importantly, research shows that psychological flexibility not only predicts a wide range of outcomes, it also demonstrates that interventions can enhance it to promote emotional health and productivity in the work environment. As noted, psychological flexibility is at the core of ACT's model of mental health and behavioral effectiveness (Hayes et al. 1999). ACT hypothesizes that an increase in psychological flexibility constitutes the mechanism, or mediator, by which this intervention enhances mental health and performance (Hayes et al. 1999). Results from randomized controlled intervention trials have supported this mediation hypothesis in relation to ACT's ability to improve employee mental health (Bond and Bunce 2000; Flaxman and Bond 2010; Lloyd et al. 2013), enhance employees' ability to be innovative (Bond and Bunce 2000), reduce emotional burnout, and increase helpful attitudes toward client groups (Hayes et al. 2004; Lloyd et al. 2013). In sum, research shows that psychological flexibility is an important variable for predicting people's mental health and behavioral effectiveness in the workplace; furthermore, ACT training can enhance this characteristic and, as a result, produce emotional and behavioral benefits to workers and their organizations.

The hexagon: the six characteristics that promote psychological flexibility

ACT postulates six core processes that, together, promote psychological flexibility; as we discuss later, ACT, including when used in the workplace, attempts to enhance these processes. The hexagon (colloquially referred to as the hexaflex; see Figure 11.1) is a graphic representation of the six core psychological processes that constitute psychological flexibility (and we can influence those processes through various ACT techniques) (Hayes et al. 2006). The processes on the left of the hexaflex (acceptance and defusion) constitute the mindfulness processes, whilst those on the right (values and committed action) promote commitment to values-based action processes. The two at the center of the hexaflex (present moment and self as context) facilitate both types of processes. As we will discuss, though, and as the connecting lines amongst the processes suggest, this distinction between the mindfulness and values-based action processes is not so clear-cut, and one set can help to facilitate the other.

Values

For individuals, *values* refer to a direction of travel that people choose to take in their lives, and that give their lives meaning. People need to work constantly
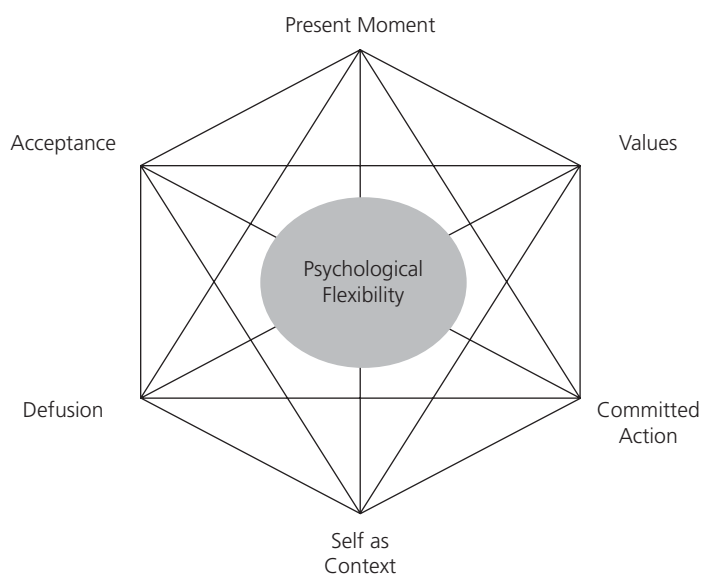
Fig. 11.1 ACT's psychological flexibility model.

toward their values, as they can never be forever (if ever) achieved, or sustained (Hayes et al. 2012). For example, a person has to work constantly on being a loving partner; it cannot be achieved in perpetuity without consistently taking action. Indeed, values drive people's goals and day-to-day actions.

Committed action

C*ommitted action* involves the specification of actions or goals that individuals pledge to take, in order to move toward their values (Hayes et al. 2012). Taking committed action will likely involve creating an (albeit perhaps informal) action plan that specifies the goal, how it will be achieved, psychological and external barriers that may get in the way of achieving the goal, and perhaps even a time frame in which sub-goals and the goal itself will be met (Bond et al. 2006). Importantly, the concept of committed action implies strongly that problems are an inevitable part of working toward goals, and they should be expected and addressed (Hayes et al. 2011). Psychological "problems" such as anxiety, and other unwanted internal events, are considered "normal" and not something that needs to be changed or gotten rid of in order to achieve one's goals; people need only approach them from a mindful perspective.

Self as context

S*elf as context (SAC)* is a complex process that has a wide range of psychological implications, for matters ranging from mental health and autistic spectrum disorder to cognitive ability (Hayes et al. 2012). One key function of SAC is that it creates a psychological space from which people can mindfully observe their self-conceptualizations (e.g., "I am a shy person," "I am a good partner"), without having such conceptualizations overly determine their actions (Hayes et al. 2012). Instead, from a perspective of SAC, and the mindfulness it promotes, people are better able to take actions, in a given context, that are more consistent with their values (e.g., intimacy) than their thoughts as to who they are (e.g., an unlovable person) and who they are not (e.g., confident). As we discuss later, SAC also constitutes a more stable perspective *from where people can observe their internal events* as part of themselves but not wholly themselves; they are more than the constantly fluctuating private experiences that they experience. As research shows, when people view their thoughts, feelings, and memories from the perspective of SAC, then these internal events tend to exert a less problematic or emotional impact (Foody et al. 2013).

Defusion

Mindfulness is further promoted through the process of cognitive *defusion*. When defused, people notice their internal events—thoughts, feelings, physiological sensations, memories—as they occur, in the moment. Their focus is on the events themselves (e.g., "I am having a thought"), rather than on the meaning or content of those events (e.g., "I am a hopeless person"). In this way, people do not get entangled in their internal events and are better able to let them come and go. From an ACT perspective, defusion alters the undesirable functions of internal events (especially thoughts) without changing their form, frequency, or situational sensitivity (Hayes et al. 2012). Put another way, defusion involves changing the way that people interact with their private experiences, so, whilst they still may be present, they no longer have detrimental psychological/behavioral effects on them.

Acceptance

Defusion, SAC, and hence mindfulness are facilitated when people are willing to experience, be open to, or *accept* unwanted or difficult internal events. If, instead, people attempt to avoid those unwanted experiences, such avoidance diverts their responding away from the present moment and toward getting rid of, changing, or minimizing those unwanted internal events. Such inflexible responding to these types of experiences is unlikely to promote people's values, because they

are guided by trying to avoid unwanted internal states, rather than by seeing how they can best work toward their values and goals in the present situation.

Present moment

SAC, defusion, and acceptance are the tools that allow people to be in the *present moment* and be aware of, and open to, the (even difficult) internal and external events that they are currently experiencing. In so doing, people can better attend to broad or narrow ranges of the current moment, as the context demands. At times, it will be beneficial for people to attend to a broad range of the present moment (e.g., when driving a car through a busy intersection); at other times, it is more useful for people to focus on a narrow range of a particular situation (e.g., when having an uncomfortable conversation with one's partner). Being in the present moment helps people to establish which degree of focus is most advantageous to them (in relation to their values and goals) in a given situation; the other three mindfulness processes—SAC, defusion, and acceptance—give them the ability to realize that advantage (e.g., by listening to criticism from one's partner in order to promote intimacy), despite any emotional difficulties experienced in that situation.

As may be seen, ACT largely conceptualizes mindfulness as a means to an end: Living a valued, or meaningful, life. It is the tool that allows people to overcome the internal events that can prevent one from doing so. As noted earlier, the connecting lines inside the hexagon in Figure 11.1 indicate that mindfulness not only promotes valued living, but identifying one's values and committing to values-based goals gives people the impetus to engage in the (at times effortful) processes that, for ACT, constitute mindfulness. Thus, the mindfulness and values-based action skills come together in ACT to produce a mutually beneficial and virtuous cycle that can promote a meaningful life.

ACT and mindfulness

As mindfulness is a core aspect of psychological flexibility, it is understandable that ACT interventions include many techniques that attempt to enhance mindfulness. Interestingly, though, ACT tends to use mindfulness techniques that are shorter, less formal, and more varied than those used by other psychological approaches to mindfulness. For example, mindfulness-based stress reduction (MBSR; Kabat-Zinn 1990) advocates meditating for 45 minutes per day, with people directing their attention to the ever-changing physiological and psychological processes occurring in their bodies. In contrast, ACT tends to use mindfulness techniques that are rarely more than 15–20 minutes long and are more often done during the normal course of a person's day (e.g., taking

a shower or walking to work mindfully, or through mindful engagement in value-guided actions). When we apply ACT to the workplace (Bond and Hayes 2002; Flaxman et al. 2013), we use many mindfulness meditation exercises that can be shorter still, approximately 10 minutes. In so doing, we are attempting to teach workers with very busy days both formal and informal (i.e., non-sitting) meditation techniques that they may actually use on a regular basis.

More substantively, though, ACT uses shorter mindfulness meditation techniques because, as noted, the goal of ACT is to get people to take actions that will help them to construct more meaningful lives; mindfulness is viewed primarily as a strategy that will help them to take that action in the presence of difficult or challenging internal events. This is in contrast to some other psychology-focused uses of mindfulness, such as MBSR, whose primary therapeutic goal is largely to promote mindfulness, in-and-of-itself. That said, ACT does recognize, and advocates, the psychological and physiological benefits of mindfulness, in-and-of-themselves (Creswell et al. 2012). For example, research indicates that even one 15–20-minute meditation session can have beneficial physiological effects, including on temporal gene expression that is associated with a range of physiological functioning, including inflammatory responses, insulin secretion, and even telomere maintenance. These beneficial changes were seen for novice meditators and even more strongly for long-term practitioners (Bhasin et al. 2013). Briefly discussing these benefits in training sessions can often serve to enhance the face validity of a skill that some workers may see as less important than ones surrounding, for example, cardiovascular types of exercise.

ACT techniques for promoting mindfulness in the workplace

In order to see more clearly the way that we foster mindfulness using ACT in the workplace, we will describe a number of brief and varied techniques that we use in our empirically validated training program (Flaxman et al. 2013). Each one is normally more closely associated with one process on the hexagon shown in Figure 11.1 and described earlier. It may be useful to note several points when we describe these techniques or skills:

1 Each one, alone, is useful for encouraging mindfulness, even if it does not resemble formal meditation.

2 Consistent with the psychological flexibility model, each process on the hexagon, and its associated technique or skill, helps to develop skills associated with all of the other processes on the hexagon; thus, many different types of skills (e.g., clarifying one's values) can work together to promote mindfulness, not just those that "look like" meditation or mindfulness.

3 None takes more than approximately 15–20 minutes to complete during one's day and so are useful to busy workers.

In short, the hexagon and its associated skills help to show, from an ACT perspective, the different processes from which mindfulness emerges, is encouraged, and is maintained in the service of a meaningful life.

Present moment

The following extract is from our empirically validated ACT at work training manual. It is, perhaps, the ACT at work exercise that is closest to a formal, sitting meditation; it is also significantly shorter than formal meditation exercises advocated by other interventions (e.g., Segal et al. 2002).

> First, we encourage participants to adopt an upright posture, with the back straight and dignified but not too rigid, and spine infused with energy. We say that by doing this we are "doing what the meditators do." We invite participants either to close their eyes or allow the gaze to become unfocused and directed downward.
>
> We then invite participants to pay mindful attention to current sensations in their feet and toes, perhaps noticing any tingling or throbbing in their feet or toes; noticing whether different parts of the feet feel warmer or colder than other parts; noticing the sensations of their feet encased within their shoes; and exploring any areas of pressure in the soles of the feet where they contact the floor. After a few moments, we invite participants to shift the "spotlight of their attention" to current sensations in the hands and fingers—just noticing, without judgment, whatever sensations are there in this moment to be noticed; exploring with gentle curiosity and interest any tingling or throbbing in the hands and fingers; noticing the position and temperature of their hands and fingers. While focusing on hands and fingers, we encourage participants to notice how easy it is to drift away into thoughts and lose awareness of current physical sensations. Each time participants notice they have drifted away into thought, they are asked to return attention once again to sensations in the body. We then invite participants to shift their attention to the abdomen for a minute or so, noticing the sensations and movement in the tummy with each breath. Finally, we end this brief exercise by inviting participants to expand their awareness from the abdomen to notice sensations throughout the entire body—to gradually develop a "strong sense of the entire body" sitting here in this chair, in the here and now. We then ask participants to open their eyes and return to the room (Flaxman et al. 2013, pp. 82–83).

This exercise helps people to develop the flexibility to attend both to narrow and broader aspects of the present moment (e.g., the abdomen and the entire body, respectively, in this present moment exercise). This skill, in itself, is useful in the work environment, as it helps people to concentrate on a particular task; in addition, it can help people to notice quickly, because they are in the present moment, when they might react avoidantly to an internal event (e.g., anxiety). It can thus function as an early warning indicator that it would be useful for them to accept such an internal event, instead of avoiding it.

Acceptance

The more that people can be in the present moment, the better they will be able to notice and respond flexibly to their internal and external events. Such present moment attention can be very painful for people, unless they are willing to experience or accept internal events that they do not like (Hayes et al. 2001). To develop people's ability to respond with acceptance, we normally use a "physicalizing" exercise (Hayes et al. 1999) that can help people to be willing to experience their difficult internal events.

In this exercise, we ask participants to think of a current or recent situation (or person) that they have found difficult. This does not have to be a major life issue, just an experience that they have found moderately uncomfortable. As participants think about the situation or person, we ask them to notice any sensations or feelings that arise, and we ask them to note whereabouts in the body it is the strongest (e.g., the chest or stomach). We ask various questions that draw mindful attention to the underlying physical sensations—such as whether a noticed feeling or sensation that arises feels sharp or dull, warm or cold, static or pulsating, and whether the feeling is on the surface of the body or deep down inside (or both). In the next part of this practice, we ask our participants to imagine that the feeling or sensation is a physical object so that they can reach into their body, pull it out, and sit it down next to them. We then get them to really experience the "object," by asking them a series of questions about it, such as "What is the shape of the object? What color is the object? What is its texture like?" We also ask about its size, weight, density, and any other physical attributes.

The aim here is to cultivate some healthy psychological distance between the *feeler* (i.e., the person) and the *feeling*, and also to provide a way of practicing simply "being with" what may be a somewhat difficult feeling or somatic sensation. At the end of this exercise, participants are asked to welcome the object back inside the skin, from where they first removed it, and they are asked to notice whether or not it has changed. We emphasize that the goal of the exercise is not to reduce or change unpleasant feelings or sensations, but to take a psychological step back and to observe the feeling or sensation for what it actually is and not what it may represent or imply. The ultimate aim is to reduce the unhelpful influence that (typically undesirable) emotions can exert over our ability to pursue personally valued actions and goals.

Defusion

In our ACT at work protocol (see Flaxman et al. 2013), one of the well-known ACT defusion techniques we have used is the *Milk, Milk, Milk* exercise, originally devised by Titchener in 1916 (as described by Hayes et al. 1999, pp. 154–156). In

it, participants are first asked for any thoughts that come to their minds in rela-tion to the word "milk," and they tend to come up with ones such as "it's white and tastes disgusting"; "cows"; "feeding my baby"; "it goes in my tea." Participants and the trainer then continually repeat the word "milk" for approximately 45 seconds. During this time, the trainer occasionally encourages participants to speed up, slow down, say the word louder, and to really experience the word. At the end of the 45 seconds, the trainer asks whether the participants noticed any-thing while performing this rather strange exercise. More often than not, partici-pants notice that the meaning of the word (e.g., white stuff, cows, feeding babies, etc.) disappears as they begin to experience the word "milk" simply as a word or sound.

Immediately following the exercise, we write the word "milk" on a flip chart or whiteboard, alongside some words that summarize various negative self-conceptualizations (e.g., "I'm weak," or "I'm stupid"). We then offer the follow-ing observation: *At the level of literal meaning*, "milk" and "stupid" are very different; however, on another level, *the level of word and sound*, "milk" and "stupid" are *not* fundamentally different—they are, after all, both just words or sounds. We go on to discuss that it is not necessary to suspend literal meaning in this way for very long. Rather, the *Milk* exercise is simply designed to provide a glimpse of the "illusion" that is naturally woven by taking thoughts and lan-guage as if they were the actual event that they represented. Nonetheless, an occasional glimpse of this process is often all it takes to reduce thought believ-ability and undermine the context of cognitive fusion (cf. Masuda et al. 2004).

Another defusion strategy that is facilitated by, and facilitates, present moment awareness and acceptance involves how we label our experience of internal events; in particular, it involves, for example, substituting the label "I *am* anxious" or "I *am* stressed" for the more accurate and more defused state-ment "I am *having the feeling of* anxiety" or "I am *having the thought that* I'm stressed" (Hayes et al. 1999). Participants often instantly recognize how such labeling offers a more defused and descriptive (i.e., less evaluative) way of relat-ing to private events. This technique has additional benefits: For example, it can help participants to practice labeling internal events as they unfold in present moment awareness (e.g., now I'm having this thought; now I'm having this memory; now I'm having this feeling; now I'm having this bodily sensation). It also highlights the fundamental (yet often overlooked) distinction that exists between difficult private events and the person who is having those experiences (Hayes et al. 2004); this is a distinction that experiments show reduces emo-tional distress (e.g., Foody et al. 2013).

As can be seen, people can use these two defusion techniques—and especially the second one—in order to promote mindfulness quickly, in any situation, and

even when experiencing difficult or unwanted internal events. No formal meditation is required in order to use them effectively. As the hexagon implies, present moment awareness and acceptance can facilitate the efficacy of these two techniques, just as defusion can promote people's willingness to be present with and experience difficult private experiences; these are all mutually beneficial processes and skills.

Self as context

One of the core aims of ACT is to help people contact a stable sense of self that is distinct from (and therefore not threatened by) negative thoughts, memories, emotions, sensations, and other internal events. In ACT, this somewhat transcendent sense of self is often referred to as SAC, or the "observing self"; it is accessed through various defusion and mindfulness exercises, such as the mindfulness meditation described earlier, as well as the physicalizing exercise (also see Hayes et al. 2012). Furthermore, we use metaphors in order to make the observation that there are essentially two processes operating during mindfulness practice—first there is "The Mind," constantly doing what minds are designed to do (i.e., chattering, predicting, imagining, planning, worrying, comparing, judging, criticizing, and so on); and then there is "The Observer" (or Awareness), which is the SAC perspective; the unchanging part of us that has always observed ourselves—our beliefs, thinking, emotions, and memories. It is the part of us that knows we have changed, in physical appearance, beliefs, and feelings, because *it* has always been there, observing these changes. To emphasize this point, we use a cloud and sky metaphor (from Hayes et al. 1999, p. 187), in which clouds and weather are the "verbal chatter" of the mind, behind which lies blue sky. We do not have to remove the clouds to know that there is blue sky; whenever we look we will see that it is there.

   We would typically guide participants through a brief observer experiential exercise to encourage experiential contact with SAC (see Harris 2008, pp. 176–177). The exercise asks us to notice thoughts, emotions, and sensations as they unfold in the here and now, and become aware that part of us is able to stand back and to *observe* these internal events. Participants are encouraged to experience their thoughts, feelings, and sensations as constantly changing, while the observing self is a constant—always there, noticing these changes. As can be seen, when using more formal mindfulness meditation to promote SAC, ACT tweaks the practice so that it is more guided in nature, helping people to see their experiences from their observing self. As with the other mindfulness processes discussed earlier, SAC facilitates, and is facilitated by, the others.

Clarifying values

One of the primary reasons for promoting mindfulness skills in ACT is that they can help to ensure that people do not aimlessly go about their life, failing to pursue a direction that is meaningful to them. As noted earlier, in ACT, a value is a chosen life direction that is never achieved, or at least achieved indefinitely; for example, one must work constantly at being a caring partner: Even if one is caring today, further caring actions need to be undertaken tomorrow in order to remain caring. In contrast, goals are specific and have discrete outcomes that constitute observable steps in the direction of one's values; actively listening to one's partner instead of watching the television could be a goal that is in the service of the value of being a caring partner.

Mindfulness is useful in clarifying values in at least two ways. First, it facilitates the "accuracy" of a values assessment exercise that we use in our workplace ACT training program. In this exercise, participants are presented with ten core areas of life (e.g., family relations, work/career, recreation/leisure, physical health, and so on) (adapted from Hayes et al. 1999, pp. 224–225). Participants are asked to write down their "chosen life directions" (i.e., values) in each area of life that they rate as personally important. To facilitate this process, the trainer introduces various questions, such as "Imagine you are now 80 years old and looking back. What footprints would you like to see behind you in this area of your life?" and "What do you want to *be about* in this area of your life?" and "If you have goals in this area of your life, in which direction are they taking you?" These questions can themselves help to increase mindfulness by promoting defusion and the perspective-taking that can enhance SAC. According to ACT theory, though, people who approach this exercise from a mindful perspective to start with are more likely to contact the values that are truly meaningful to them, rather than what is meaningful to others or what they feel is expected of them.

Mindfulness is further helpful in values clarification in that it helps people to identify honestly "internal barriers" (e.g., difficult or unhelpful thoughts, memories, moods, or emotions) that have the potential to interfere with clarifying and pursuing their valued directions (e.g., fear of rejection). These barriers often provide the richest material around which to practice and develop mindfulness and acceptance skills, as they are the internal events that can most effectively block people from living a life that is meaningful to them.

Finally, mindfulness can help people to distinguish between internal barriers to living a valued life (e.g., anxiety) and external barriers (e.g., lack of relevant skills). It is not unusual for these two types of barriers to interact, so that people fail to address an external barrier because they do not recognize or acknowledge

the internal one. Thus, the reason given for not pursuing one's values is the external barrier when, in fact, it could be overcome if only a person were willing to address the internal one.

Unsurprisingly, reflecting on one's values in a considered and methodical manner can be powerful, and participants occasionally become upset while completing such exercises, especially if they realize that they have been mindlessly pursuing life directions that they would not ultimately choose for themselves. Here, mindfulness skills help people to make room for that upset so that they are freer to identify, accept, and move in directions that are meaningful to them. Finally, and reflected in the hexagon, clarifying values and identifying internal barriers to pursuing them can serve as an impetus to practice the mindfulness exercises that will help them to create their meaningful life; a point that we often make in our training sessions.

Increasing commitment to values-based goals and actions

In our ACT at work protocol (Flaxman et al. 2013), we use a number of strategies that encourage participants to generate concrete goals and action plans that are based upon the values that they have identified. For example, after every session in our ACT training, participants are invited to choose three relatively small value-guided actions that they would be willing to perform over the next week. Our participants are encouraged to engage in these actions *mindfully*—that is, by noticing what happens before, during, and after the action, and also by noticing any thoughts and feelings that arise and have the potential to function as "internal barriers" to the pursuit of these actions. We also ask if they will commit to achieving four values-consistent goals between the second and third sessions, and we distribute diaries and rating forms that are designed to encourage participants to self-monitor their progress toward achieving those goals. These materials also help participants more generally to monitor their values-based behavior on a weekly basis. Such goal-identification, commitment making, and careful monitoring in themselves can promote the defusion, perspective taking, and acceptance that encourage mindfulness. We also clearly show how the mindfulness techniques that they are learning will serve them well in moving through the difficult psychological content that they will experience when taking action to achieve their life-enhancing goals.

ACT: a multi-method approach to mindfulness

As can be seen, our workplace ACT protocol, like most other ACT guides, does not focus heavily on formal meditation practice (Hayes et al. 2012), but it does include guided experiential exercises, metaphors, and other interventions that

promote mindfulness. From a training and therapeutic perspective, we believe that this diverse range of mindfulness exercises is a strength; if one type does not work for a person, perhaps another one will. From a theoretical perspective, it is reassuring that, despite the eclectic range of ACT techniques, as contrasted to formal meditation only, research is very consistent in showing that these various techniques appear to work by impacting the same psychological mechanism: Psychological flexibility (Hayes et al. 2006; Bond et al. in prep.). Knowing this is not just a theoretical nicety; it also allows people to expand and develop ACT to include additional, and perhaps more effective, mindfulness interventions that can target this mechanism and thus help people to lead vital and meaningful lives. The increasing acceptance of, and research literature supporting, contextual CBTs augurs well for this expansion, and we look forward to seeing how it develops.

Personal Meditation Journey

Frank W. Bond

I do not think that I really understand the distinctions and overlaps between meditation and mindfulness. I have examined the relevant literature to try to identify established and agreed-upon definitions for both terms, but I have not been able to do so for "meditation," although I have found agreed-upon definitions for "mindfulness." Perhaps this should not be surprising, as operational definitions are crucial in science but are less important in the realm of religion, from which meditation originally emerges. Psychology has largely adopted the term mindfulness, so it is not surprising that there are agreed-upon definitions for this word. Further complicating the definitional quandary is that "mindfulness meditation" is used freely in the literature, which could imply that this is different from mere "meditation" or "mindfulness." I mention this definitional issue only because I do not know whether what I personally practice is meditation or mindfulness, but here is my personal account of my experience with what I shall term mindfulness.

As an undergraduate, I would lie on my floor with headphones on and really concentrate on listening to modern composers, particularly Luciano Berio. I found trying to pick out the different instruments, and the different ranges and tempos at which they played, incredibly enjoyable. It was effortful to do this, but I found that I got more accustomed to doing it over time. It was many years later that I heard the term mindfulness, and its definition of deliberately observing one's psychological and physiological events on a moment-to-moment basis, in a non-elaborative, open, curious, and non-judgmental manner. I then realized that I had been doing this, with regard to music, for many years and so I decided

to try to extend mindfulness to other areas of my life, from walking to work to speaking with a friend. I found this very satisfying and meaningful; engaging in the here-and-now was far more calming and enjoyable than being wrapped up in my own thoughts.

When I discovered ACT, with its emphasis on mindfulness and its roots in science, I knew that I had found a psychological theory of human cognition and behavior that resonated with me, both as a scientist and as a person. As we note in this chapter, ACT uses brief and/or guided mindfulness techniques that are largely integrated into one's daily life (e.g., listening to music or talking with a friend). This is how I had been using mindfulness for many years, and ACT showed me how I could extend this practice into my life in a way that could make it more vital and meaningful.

About ten years after stumbling upon ACT, I signed up for the traditional eight-week MBSR training, in which we were asked to practice what I consider to be "formal" meditation for approximately 45 minutes every day. This largely involved paying non-judgmental attention to your body, breath, and thoughts on a moment-to-moment basis. I was a good student and practiced my mindfulness meditation almost every day. I found it very revealing in that I was able to sit with my thoughts, boredom, and discomfort for quite some time, and that it got easier to do so the more that I practiced.

After the course ended, I soon stopped "sitting," but the "boot camp" experience of the MBSR training did increase my use of, and facility with, the going-mindfully-about-your-day techniques that ACT teaches. Occasionally, when I cannot sleep, I will do a meditation exercise that I learned in MBSR classes, so I am very glad that I had that training; however, I find trying to go mindfully about my daily life, choosing actions to take that are consistent with my values, is very useful to me in creating a meaningful life. (This is not to say, however, that formal meditation does not serve the same function for many people.) Thus, with my psychotherapy and coaching clients, I try a range of mindfulness techniques, including formal meditation, hoping that they will respond favorably to one of them. This, I think, from my own experience, is the key point: The technique (e.g., meditation) is not the issue; it is living mindfully, however one gets there. So, in my own mind and life, I think that I have addressed the quandary that I posed at the beginning of this piece: Meditation and mindfulness are distinct, with the former one being a means of achieving the latter.

References

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, **10**(2), 125–143.

Bhasin, M. K., Dusek, J. A., Chang, B. H. et al. (2013). Relaxation response induces temporal transcriptome changes in energy metabolism, insulin secretion and inflammatory pathways. *PloS one*, **8**(5), e62817.

Bond, F. W. and Bunce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology*, **5**, 156–163.

Bond, F. W. and Bunce, D. (2003). The role of acceptance and job control in mental health, job satisfaction, and work performance. *Journal of Applied Psychology*, **88**, 1057–1067.

Bond, F. W. and Flaxman, P. E. (2006). The ability of psychological flexibility and job control to predict learning, job performance, and mental health. *Journal of Organizational Behavior Management*, **26**, 113–130.

Bond, F. W., Flaxman, P. E., and Bunce, D. (2008). The influence of psychological flexibility on work redesign: Mediated moderation of a work reorganization intervention. *Journal of Applied Psychology*, **93**, 645–654.

Bond, F.W., Flaxman, P.E., and Lloyd, J. (in prep). ACT and psychological flexibility in performance settings: A meta-analysis.

Bond, F. W. and Hayes, S. C. (2002). ACT at work. In F.W. Bond and W. Dryden (Eds.). *Handbook of brief cognitive behaviour therapy*, pp. 117–140. Chichester, England: John Wiley & Sons.

Bond, F. W., Hayes, S. C., Baer, R. A. et al. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire—II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy*, **42**, 676–688.

Bond, F.W., Hayes, S.C., and Barnes-Homes, D. (2006). Psychological flexibility, ACT, and organizational behaviour. *Journal of Organizational Behavior Management*, **26**, 25–54.

Bond, F. W., Lloyd, J., and Guenole, N. (2013). The work-related acceptance and action questionnaire: Initial psychometric findings and their implications for measuring psychological flexibility in specific contexts. *Journal of Occupational and Organizational Psychology*, **86**(3), 331–347.

Brown, R. A., Lejuez, C. W., Kahler, C. W., and Strong, D. R. (2002). Distress tolerance and duration of past smoking cessation attempts. *Journal of Abnormal Psychology*, **111**(1), 180.

Brown, K. W. and Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, **84**, 822–848.

Creswell, J. D., Irwin, M. R., Burklund, L. J. et al. (2012). Mindfulness-based stress reduction training reduces loneliness and pro-inflammatory gene expression in older adults: A small randomized controlled trial. *Brain, Behavior, and Immunity*, **26**(7), 1095–1101.

Donaldson-Feilder, E. J. and Bond, F. W. (2004). The relative importance of psychological acceptance and emotional intelligence to workplace well-being. *British Journal of Guidance and Counselling*, **32**(2), 187–203.

Flaxman, P. E. and Bond, F. W. (2010). A randomised worksite comparison of acceptance and commitment therapy and stress inoculation training. *Behaviour Research and Therapy*, **48**, 816–820.

Flaxman, P. E., Bond, F.B., and Livheim, F. (2013). *The mindful and effective employee: An acceptance and commitment therapy training manual for improving well-being and performance*. Oakland, CA: New Harbinger Publications.

Foody, M., Barnes-Holmes, Y., Barnes-Holmes, D., and Luciano, C. (2013). An empirical investigation of hierarchical versus distinction relations in a self-based ACT exercise. *International Journal of Psychology and Psychological Therapy*, **13**(3), 373–388.

Harris, R. (2008). *The happiness trap: Based on ACT—a revolutionary mindfulness-based programme for overcoming stress, anxiety and depression*. London: Robinson.

Hayes, S. C., Barnes-Holmes, D., and Roche, B. (Eds.). (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition*. New York, NY: Plenum Press.

Hayes, S. C., Barnes-Holmes, D., and Wilson, K. G. (2012). Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science*, **1**(1), 1–16.

Hayes, S. C., Luoma, J. B., Bond, F. W. et al. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behavior Research and Therapy*, **44**, 1–25.

Hayes, S. C. and Strosahl, K. D. (Eds.). (2004). *A practical guide to acceptance and commitment therapy*. New York, NY: Springer.

Hayes, S. C., Strosahl, K. D., and Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behaviour change*. New York, NY: Guilford Press.

Hayes, S. C., Strosahl, K. D., Wilson, K. G. et al. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, **54**, 553–578.

Hayes, S. C., Villatte, M., Levin, M., and Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology*, **7**, 141–168.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your mind and body to face stress, pain, and illness*. New York, NY: Delacorte.

Linehan, M. M. (1993). *Cognitive-behavioural treatment of borderline personality disorder*. New York, NY: Guilford Press.

Lloyd, J., Bond, F. W., and Flaxman, P. E. (2013). The value of psychological flexibility: Examining psychological mechanisms underpinning a cognitive behavioural therapy intervention for burnout. *Work and Stress*, **27**(2), 181–199.

Marlatt, G. A. and Kristeller, J. L. (1999). Mindfulness and meditation. In W. R. Miller (Ed.). *Integrating spirituality into treatment*, pp. 67–84. Washington, DC: American Psychological Association.

Masuda, A., Hayes, S. C., Sackett, C. F., and Twohig, M. P. (2004). Cognitive defusion and self-relevant negative thoughts: Examining the impact of a ninety year old technique. *Behaviour Research and Therapy*, **42**(4), 477–485.

McCracken, L. M. (1998). Learning to live with the pain: Acceptance of pain predicts adjustment in persons with chronic pain. *Pain*, **74**(1), 21–27.

Schmidt, N. B., Richey, J. A., Cromer, K. R., and Buckner, J. D. (2007). Discomfort intolerance: Evaluation of a potential risk factor for anxiety psychopathology. *Behavior Therapy*, **38**, 247–255.

Segal, Z. V, Williams, J. M. G., and Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.

Wells, A. (2011). *Metacognitive therapy for anxiety and depression*. New York, NY: Guilford press.

Wenzlaff, R. M. and Wegner, D. M. (2000). Thought suppression. *Annual Review of Psychology*, **51**, 59–91.

Chapter 12

Mindfulness in education

Katherine Weare

Introduction

The term mindfulness refers to the ability to direct the attention to experience as it unfolds, moment by moment, with open-minded curiosity and kindness (Kabat-Zinn 1996). Mindfulness is partly an ability that can be developed, and practices that encourage mindfulness are designed to train the attention and ability to "be with" present experience in an interested rather than judgmental way. This process is intended to help loosen the grip of habitual, mindless activity, including negative ruminations and worries, and produce less reactivity and impulsiveness, and a greater ability to examine thoughts and feelings more rationally and thus respond more skillfully to life's challenges (Hölzel et al. 2011a).

The process of applying non-judgmental curiosity to experience often of itself induces a greater sense of kindness and compassion toward the self and others, and some approaches to mindfulness include specific work to train these empathic abilities. Over time, shifts can take place in unwanted repetitive mental and behavioral patterns that otherwise create and maintain negative mental states, such as stress, anxiety, depression, and hostility (Ma and Teasdale 2004). Mindfulness practice can also cultivate positive mind states such as mental stability and calm, giving rise to greater happiness, more effectiveness in everyday life, and a stronger sense of well-being and satisfaction with life (Williams and Penman 2011).

The growth of secular mindfulness

Mindfulness is said to derive from Buddhist philosophy and meditation practice, set in motion by the Buddha over 2500 years ago, although the urge to contemplation is probably as old as the human race and most religions include contemplation of some kind. However, mindfulness in the modern secular sense can be traced to the work of Jon Kabat-Zinn in the mid-1970s, himself a Buddhist meditator, working at the Medical Center at the University of Massachusetts. He was interested to discover whether the essence of the practices he found useful could

be turned into secular, brief, skills-based exercises anyone could learn. He developed an eight-week "mindfulness-based stress reduction" (MBSR) program, which taught some simple core practices in two-hour sessions once a week, supported by short home practices. He taught this program to a variety of patients who were not responding to conventional medical treatment and had intractable problems. At the time his course had a clear and relatively rapid impact on the psychological and physical health of the people who took part (Kabat-Zinn 1996). The basic formula of the eight-week course has stood the test of time, and is still the way many Western adults initially encounter secular mindfulness, including its adaptations such as mindfulness-based cognitive therapy (MBCT) for recurrent depression.

Mindfulness practices

Secular mindfulness is learned through mind-training practices—some of which might be termed 'meditations'—in which the learner is encouraged to pay bare attention to their changing experience, for example to the sensation of the breath, to passing sound, and to the inner stream of thoughts, feelings, and bodily sensations. These practices are usually undertaken in a state of stillness. Other practices are more active and include paying attention to usually taken-for-granted activities—examples are mindful eating, mindful walking, and mindful movement. Learners are encouraged to pay open-minded and curious attention—as if for the first time—to some daily activities they usually do on "automatic pilot," such as showering and washing dishes. Other practices include learning to be more mindful of communications with others, and of one's reactions to experiences, both pleasant and unpleasant. Ultimately mindfulness can include paying close attention to any and all aspects of experience.

The evidence base for adult mindfulness

The emerging evidence base, derived from an exponentially increasing number of studies, suggests that mindfulness has a wide range of potential applications for mental and physical health. Well-conducted randomized controlled trials (RCTs) have shown moderate impacts (statistically speaking) of relatively short interventions for adults on depression, anxiety, and stress, and on physical health problems, such as pain, blood pressure, and the immune function (Baer 2006; Goyal et al. 2014).

Mindfulness training is popular with funding bodies as it is relatively cheap to provide and carries the promise of some fairly rapid and sustained benefits. In the UK, the MBCT course is now recommended for recurrent depression by the National Institute for Health and Care Excellence (NICE 2009), having

proved to be twice as effective as "treatment as usual." The time spent learning mindfulness does not have to be extensive, although it is generally agreed that more is better, provided practice is gradually increased. Pre/post analysis showed that five days of 20-minute mindfulness meditations in adults reduced anxiety, depression, anger, and fatigue, improved immune-reactivity, and decreased cortisol (a stress hormone), and four days of mindfulness training was sufficient to improve mindfulness, visual-spatial memory, working memory, and sustained attention (Hölzel et al. 2011a). Eight weeks of mindfulness practice have been shown to start to reshape the neural pathways in the brain, increasing the areas associated with kindness, compassion, and rationality and decreasing those involved in anxiety, worry, and impulsiveness (Davidson and Lutz 2008).

What mindfulness adds to existing approaches

Rather than using mindfulness meditation as a stand-alone panacea or magic bullet, recent initiatives for both adults and young people see mindfulness as being a "value added" intervention, augmenting other evidence-based approaches. Relatively small amounts of mindfulness can usefully be added to enhance other efforts such as CBT in health contexts and social and emotional learning (SEL) in school contexts, to help people manage their thoughts, feelings, and behavior. Mindfulness brings to more cerebral and words-based approaches, the ability to ground both therapy and learning in immediate felt and embodied experience. Mindfulness also provides a balance to the tendency of therapy and education to want people to change, to "fix things" and help people immediately think more "positively"—the value-laden judgments of which can sometimes get in the way of helping people get in touch with and understand what is happening to them, actually making them feel worse. Mindfulness can bring a greater recognition of the value of first simply accepting how things are, and the paradox that it is only when people accept who they are that they are actually able to change. We explore further the ways in which mindfulness brings this 'value added' to existing work in schools on 'resilience', life skills, and social and emotional learning later in this chapter.

The growth of mindfulness programs for children and young people

Mindfulness in schools is not totally new. Some "alternative" schools such as Montessori and Steiner have routinely included a focus on mindfulness in the sense of concentrated attention to sensory experience (Lillard 2011), and there have been sporadic attempts to interest those in education in

mindfulness for at least two decades (e.g., Langer 1993). Now mindfulness is developing fairly rapidly in mainstream schools, although it is far from being widespread.

Mindfulness programs by definition share a focus on the core intention of developing the ability to pay bare attention and to being present with experience with open-minded curiosity. Beyond that they range widely in aims and scope; those with the most sound evidence base will be outlined as illustrations in this chapter. The bulk of school-based programs come from the US, but work is developing elsewhere, including in Europe, Australasia, and in the East—where mindfulness could be said to have originated and have its natural roots.

Teaching approaches for mindfulness with young people

The basic intentions and approaches to mindfulness for the young are the same as for adult mindfulness, as described at the beginning of this chapter. Young people do not, however, enter the classroom as keen trainee contemplatives and the idea of sitting quietly focusing the mind may seem many miles from their current habits and mindsets in their multi-tasking, distracted worlds. Unlike adults, for whom mindfulness is a voluntary activity, many young people will encounter mindfulness as "conscripts," i.e. as part of their compulsory curriculum, not as something in which they have expressed a particular interest. Programs therefore need to capture their imagination, and developers are experimenting with approaches that demonstrate rich diversity and considerable innovation (Kaiser-Greenland 2009; Meiklejohn et al. 2012). Some programs, such as the Stressed Teens program (Beigal 2009; see Case Study 1), working with older students, use the format of the eight-week MBSR course. Others, such as the UK's Mindfulness in Schools Project (Mindfulness in Schools 2014; see Case Study 2 later), have at their core the familiar basic practices of mindfulness but they also use fun activities, tangible objects, vivid images, media, and resources, and a pacey and edgy style that appeals to more active learning styles and higher energy levels. Some programs work directly with the active and lively nature of youth to include yoga, tai chi, relaxation, music, the arts, and contact with nature (e.g., Holistic Life Foundation 2014). In comparison with adult mindfulness courses, sessions and practices for the young tend to be briefer, the length of a conventional lesson—or less in the case of younger children—and more structured, with more repetition and with more overt explanations about the purpose of the activity for often skeptical youth.

The evidence base with children and young people

The evidence base for work on mindfulness and youth can be described as "promising." There are to date eight reviews of the quantitative studies of mindfulness and the young, the most recent of which are two meta-analyses by Zoogman et al. (2015) and Zenner et al. (2014). Both concluded that mindfulness had an overall effect size in the small to moderate range and found no examples of adverse (harmful) effects. There is also a growing literature of qualitative work, on mindfulness for the young in health contexts, on mindfulness for the adults who work with youth, on the theories behind mindfulness, and on the neuroscience of mindfulness. Interventions amenable for robust evaluation tend to be relatively short, with six to eight sessions being common, although many are part of wider and more diffuse programs and frameworks. They are diverse but tend to be in schools rather than health settings, and more with adolescents than with younger students. Twice as many are targeted as universal programs, and a growing number in teacher education and in the community.

All reviews comment on the methodological weaknesses of existing studies (e.g., Greenberg and Harris 2012), as would be expected in a young field. Studies are generally underpowered, being mostly small pilots and exploratory studies. There are few RCTs. There are a number of studies that show some element of control (mostly wait-list), but many are before and after studies with no controls. Few studies have adequate follow-up. Measurement is underdeveloped, with few measures designed specifically for young people, no standardization or even much overlap in the use of measures, and a good deal of emphasis on self-report rather than more "objective" measures. Studies cover a diverse range of age groups, contexts, problems, and conditions, with little replication, which undermines claims for generalizability. There is frequent use of the same teams to design, deliver, and evaluate programs with the consequent problem of bias.

Calls for better quality and more robust research are being heeded and many teams are currently addressing the methodological concerns in newer research; meanwhile, there is reason to believe that all of this activity is proving to be worthwhile. The hard evidence that has emerged so far is positive and promising. Interventions tend to be highly "acceptable," that is popular with staff and students, with no reported adverse effects. The outcomes, which will be discussed later, are very much in line with the outcomes that have emerged in research with adults. The same broad processes and mechanisms are at work for children and adults, although some teams are now examining the developmental aspects of mindfulness; for example, how mindfulness skills and the nature of appropriate interventions may change across the age range.

Impact of mindfulness on mental health in children and young people

Mindfulness would appear to be helpful in addressing youth mental health difficulties, echoing its demonstrable success with adults (Baer 2006; Ma and Teasdale 2004). Although the impacts of any particular intervention are not guaranteed, both targeted and universal interventions have generally had at least a modest impact on mental health problems in the young. Indeed, mindfulness interventions appear to have had the most impact in both adults and young people in addressing such problems. The recent meta-analysis by Zoogman et al. (2015) of 20 studies concluded that both targeted and universal interventions had twice the effect on "psychological symptoms" compared to other outcomes measured by studies of mindfulness interventions for youth, such as well-being or learning.

This impact on mental health is welcome, as the level of problems is alarming and increasing, running currently at about 25% of young people with an identifiable disorder and 10% needing specialist treatment (UK estimate by the Mental Health Foundation 2014). Such figures probably represent the tip of the iceberg, as most young people with mental health problems remain untreated. In the wider population, problems such as anxiety, depression, low self-esteem, self-harm, bullying, and stress are widespread, with serious impacts on well-being and quality of life. Even low-level mental health problems can disrupt thinking, undermine enjoyment of life, hinder learning, and diminish school performance (Barnes et al. 2003), a state that has been termed 'languishing' (Keyes 2002).

The case for a targeted/universal balance

One way to approach mental health problems is through targeting those people with problems. Children and young people targeted by mindfulness interventions so far represent a wide range of problematic conditions, particularly depression, anxiety, behavior problems/attention deficit hyperactivity disorder (ADHD), substance abuse, sleep problems, and learning difficulties. Targeted approaches in mindfulness have generally been shown to have significantly greater impacts than universal ones, in line with the well-documented tendency for mental health interventions to have the largest impact on those with most need (Shucksmith et al. 2007; Weare and Nind 2011). In their meta-analysis, Zoogman et al. (2015) found twice as much impact on children and young people drawn from clinical samples (i.e., with a defined problem) compared to non-clinical samples, for example in special schools.

Case Study 1: The impact of targeted mindfulness on children and young people with mental health problems

Biegel et al. (2009) studied the effects of the **Stressed Teen program** for children and young people who were receiving clinical help for a wide range of psychiatric problems. It followed the adult MBSR course pattern of eight weekly classes of two hours per week and used the same practices of attention to the breath, body scan, sitting meditation letting thoughts come and go, mindful movement/yoga, and walking meditation. However, as participants were young, practices were shorter, on average 20 rather than 40 minutes, and discussion in class focused on issues relevant to these young people, including self-image, life transitions, self-harming behaviors, and relationships. For homework students were asked to pay mindful attention to selected routine, day-to-day activities. All received a workbook to reinforce the instruction and a CD with sitting and body scan meditations for at-home practice.

One hundred and four children and young people were eligible to take part and were randomly allocated to control and experimental groups, with 74 of them completing all three phases of the assessment. When compared with the control group (who received the intervention later), those who received the course reported reduced symptoms of anxiety, depression, and somatic distress (i.e., physical symptoms thought to be caused by psychological problems), an overall sense of well-being, increased self-esteem, and better sleep.

However, although targeted inputs have the most impact in absolute terms, the case is clear for a balance that also includes universal mental health interventions that attempt to push the whole population toward a state of optimal mental health, or "flourishing" (Huppert 2014). The mental health promotion paradigm has shifted in recent years away from a focus on pathology alone to include the positive, with a surge of energy under various banners, including positive psychology, flourishing, well-being, resilience, strengths, and capacities. There is growing interest in interventions and policies that put subjective well-being at the center and have the potential to increase the level of well-being across the population. Newer approaches such as mindfulness are very much a part of this shift in offering a helpful intervention for all across the mental health spectrum (Huppert 2014; Keyes 2002).

The evidence is that universal approaches appear to help people who are "doing well" to experience even better mental health and at the same time have their greatest impact on those at the sharp end of difficulty (Adi et al. 2007; Huppert 2014; Weare and Nind 2011). Many children and their carers never seek clinical interventions for emotional disorders (Farrell and Barrett 2007) and so providing universal programs is a vital way to reach a needy and underserved population. Providing a universal entitlement helps avoid the pernicious problem of stigma almost invariably associated with targeting, which makes those most in need of help reluctant to attend or to cooperate. Universal entitlement also creates a humane and respectful culture and ethos that helps everyone, including those "without problems," to support young people "with

problems." In such a context, the needs of the more vulnerable can be better understood, and the overall environment is therapeutic rather than toxic, avoiding recreating the conditions under which people's problems return or increase.

We turn now to look in more detail at the outcomes of mindfulness practice for children and young people, beginning by examining the impact on mental health problems.

Specific mental health outcomes

Depression

A positive impact on depression is one of the most common outcomes of mindfulness for adults (NICE 2009) and a growing number of studies report a reliable impact on child and adolescent depression from a wide range of different interventions (e.g., Biegel et al. 2009; see Case Study 1). As with adults, this impact appears to be connected to the role of mindfulness in reducing worry by allowing people to gain a sense of space and objectivity around their thoughts and "unhook" from the automatic pilot of circular negative rumination (Hölzel et al. 2011b; Ma and Teasdale 2004). Case Study 2 illustrates the content and evaluation of a program from the UK that is having clear impacts on depression.

Case Study 2: The impact of a universal approach to mindfulness on depression in teenagers

The **Mindfulness in Schools curriculum** (Mindfulness in Schools 2014) from the UK is aimed at teens and is a nine-week course of one session a week. It takes place in normal lesson time and is supported by home practice. The overall content is based loosely on the MBSR course and includes the basic practices of mindfulness of breath and of body, the passing nature of thoughts, mindful eating, mindful walking, and dealing with stress. It is supported by a manual, an indicative script for teachers, and a student booklet. The course designers, who are classroom teachers, focused particularly on making the program attractive to teens, with interactive, experiential, and lively teaching methods and high quality resources, including film clips, and challenging and often edgy activities, such as the mindful eating of hot chilli and a 'shockball' game.

The program was evaluated in a non-randomized controlled study of a sample of 522 young people aged 12 to 16 in 12 secondary schools (Kuyken et al. 2013). Young people in the intervention group reported significantly fewer depressive symptoms post-treatment and at three-month follow-up, and lower stress and greater well-being at follow-up. Although young people benefitted whether or not they practiced, greater home practice was significantly associated with better outcomes such as greater well-being and less stress at follow-up.

Anxiety

Anxiety is the most reported mental health problem among children, often co-occurring with depression. The pressurized, multi-tasking nature of modern life appears to be making anxiety a chronic problem for many young people. It often persists into adulthood, and causes impairment in many areas of life. Several mindfulness interventions have shown an impact on anxiety in the young (e.g., Beauchemin et al. 2008; Semple et al. 2005).

Mindfulness appears to impact on anxiety by improving attentional focus (Semple et al. 2005) and the ability to relax (Woodruff et al. 2014). As with depression, it offers a way of "catching" recurrent worrying thought processes and helps the individual to recognize that they are passing mental phenomena rather than facts (Ma and Teasdale 2004). The ability to reduce anxiety may help to explain the fairly reliable impact on sleep and eating problems in both adults and the young (e.g., Biegel et al. 2009; see Case Study 1 earlier.)

Case study 3: Mindfulness impacts on anxiety in young children

The **Attention Academy Program** (AAP) from the US was longer than average, and consisted of 12 sessions of 45 minutes of mindfulness and relaxation over 24 weeks. It employed the familiar exercises including breath work, body scan, movement, and sensorimotor awareness activities, and was taught to children aged between five and eight with high anxiety. Napoli et al. (2005) evaluated it with a methodologically strong study, using an RCT design, a large sample of 228 participants, and objective measures of attention. There was a significant improvement in self-rated test anxiety, teacher-rated attention, social skills, and selective (visual) attention post-treatment, with effect sizes ranging from small to medium.

On well-being and "flourishing," including emotional regulation

A number of studies indicate that mindfulness as a trait is associated with better health and well-being in adults and young people, and that children and teens who are more mindful generally experience more positive emotion, greater well-being, and less negative emotion and anxiety (Ciarrochi et al. 2010). The development of "emotional regulation" is a key foundation for well-being, helping people avoid or overcome mental health problems, serving as a protective factor against the emergence of psychosomatic symptoms, and underpinning successful performance and adjustment of all kinds throughout life (Goleman 1996). Emotional regulation includes the ability to control impulses, delay gratification, monitor attention, and make wiser choices as a result. Mindfulness appears to strengthen this vital skill in both adults and young people (e.g., Beauchemin et al. 2008; Zylowska et al. 2007).

Mindfulness in adults impacts on the ability to feel calm and in control of emotions, to accept experience, to manage difficult feelings, and to be resilient, motivated, persistent, and optimistic (e.g., Mendelson et al. 2010). Varied short mindfulness interventions have had a small but measurable impact on young people's well-being and emotional regulation. Some of the areas of impact are on levels of happiness, calmness, self-acceptance, relaxation (e.g., Biegel et al. 2009; Sibinga and Stewart 2008), and the resilience to manage stress (e.g. Kuyken et al. 2013), optimism (Schonert-Reichl and Lawlor 2010), and ability to set goals more effectively (Bogels et al. 2008). A case study of one such program is provided in Case Study 4.

Case Study 4: Mindfulness enhances well-being and emotional regulation in teenagers

The **"Learning to BREATHE" curriculum** (Learning to Breathe 2014) is an MBSR-based program adapted for young people. The six lessons or themes are 45 minutes long but designed to be delivered flexibly. Each follows a predictable format, which includes a short introduction to the topic, several activities for group participation and discussion to engage students in the lesson, followed by an opportunity for in-class mindfulness practice. The core practices as usual include body scan, mindfulness of thoughts, mindfulness of emotions, and mindful movement, plus the less frequently included loving kindness practice (where students are invited to bring someone to mind, including themselves, and wish them well). Student workbooks and individual practice CDs for home mindfulness practice are provided to students.

The program was evaluated by Metz et al. (2013). Participants included 216 high school students with complete data at pre-test and post-test who participated in the program or teaching as usual as a comparison group. Students who participated in the program reported statistically lower levels of perceived stress and psychosomatic complaints, higher emotional regulation including emotional awareness, access to emotional regulation strategies, and emotional clarity.

On behavior

At least partly through its impact on emotional regulation, mindfulness appears to help initiate control of difficult behavior. There is a small but rapidly growing body of work on the measured impact of mindfulness on behavior in the young, with demonstrable impacts shown so far on ADHD, impulsiveness, aggression, and oppositional behavior (e.g., Bogels et al. 2008). Mindfulness appears to increase the capacity to "be with" experience rather than reacting, increasing the time lapse in brain pathways between the impulse to respond to a stimulus or thought and the response (Hölzel et al. 2011b), allowing more time for considered choices to be made. Mindfulness also triggers the relaxation response and induces a sense of inner calm, and this may also contribute to improvements in behavior control. This can be helpful for schools, parents, and, of course, for

young people themselves, who often have no real understanding of why they get into difficulties, let alone sufficient ability to control the process.

On relationships with the self and others

Several interventions have shown impacts on social and emotional capacities, such as self-awareness, self-esteem, and self-acceptance (e.g., Biegel et al. 2009; Haydicky et al. 2012), on sociability and relationships (e.g., Kerrigan et al. 2010; Mendelson 2010), and on attunement, including of teachers to their students (Albrecht et al. 2012). Many mindfulness programs have seen a growth in compassion and kindness as a "side effect" of practicing the core attitude of curiosity and kindness, and some (e.g., the Mindfulness in Schools Project; see Case Study 2) have added more specific sessions on kindness and compassion as they have developed. There is currently a growth in school programs (e.g., Mind with Heart 2014) that combine mindfulness with work to develop attitudes of empathy and compassion. These contain substantial specific and explicit practices that focus on a sense of kindness and wishing well to self and others and, in some cases, on developing ethical actions toward others, social responsibility, and global awareness (Mind and Life 2014; Wake Up Schools 2014).

Case Study 5: Mindfulness impacts on self-concept and sociability in young children

Schonert-Reichl and Lawlor (2010) investigated the effects of the **Mindful Education program**, a universal intervention delivered by teachers, involving ten lessons, and supported by a teaching manual. The course included the usual MBSR practices of quieting the mind, in this case listening to a resonating instrument (chime), focusing on the breath, and paying mindful attention to bodily sensations, thoughts, and feelings. More unusual components included managing negative emotions and negative thinking, positive affirmations and visualizations that aimed to foster optimism and positive affect, ways to acknowledge the self and others, and work on making friends. In addition to the mindfulness class, children also practiced mindfulness meditation three times a day in normal classes for a few minutes at a time. There was a significant increase in scores on self-report measures of optimism, positive self-concept, and positive emotions. Teacher reports showed an improvement in social and emotional competence for children in the intervention group, and a decrease in aggression and oppositional behavior.

Impact on academic performance

Academic learning is seen by most schools as their core task, with well-being and mental health often being seen as of lower priority and as supports for learning, especially in secondary schools. Schools are often reluctant to take on what they see as "someone else's business," and if mindfulness is to increase in

mainstream schools, the case has to be made for why efforts put into the promotion of well-being support academic learning.

Fortunately, making this case is becoming easier, for social and emotional learning in general and for mindfulness in particular. The evidence on the links between programs to support emotional and social well-being and school achievement is clear and definitive (Durlak et al. 2011; Zins et al. 2004). There is a growing body of neuroscience evidence about how the brain/mind/body works, which turns out to be as one interconnected organism in which emotion and cognition interact constantly, and where both acute and chronic stress inhibit healthy brain development and the ability of the higher parts of the brain to function effectively (LeDoux 1998). Brains need healthy social attachments in order to develop normally (National Research Council and Institute of Medicine 2000) and perform best when optimally stimulated but not overstressed (Csikszentmihalyi 1990).

There is also growing evidence that mindfulness can impact directly on cognitive processes and school achievement. Schools are likely to be particularly attracted to this, and the underlying sense that mindfulness is about helping students focus and "pay attention," abilities central to all learning and often increasingly lacking in today's distracted, multi-tasking youngsters. Indeed, Goleman (2013) argues that the ability to "focus" is for everyone a critical skill underlying emotional intelligence. The evidence is that mindfulness appears to enhance awareness and clarity (e.g., Zylowska et al. 2007) and develop metacognition (the ability to stand back from the thought stream and to appraise thoughts in a reflective manner) (Flook et al. 2010; Schonert-Reichl and Lawlor 2010).

Several programs in schools (e.g., Beauchemin et al. 2008; Franco et al. 2011) have been associated directly with improvements in academic learning, academic performance, and school achievement. An example is given in Case Study 6.

Case Study 6: Mindfulness improves academic learning in teenagers

A program called Meditación Fluir was taught to first-year high school students in three schools randomly chosen in a province of southern Spain. It was evaluated in a robust randomized controlled study by Franco et al. (2011). Sixty-one students were allocated at random to experimental and control groups; the control group were offered the same program later. Students were taught a 1½ hour session once a week for ten weeks and were expected to practice daily for 30 minutes. The course used the familiar MBSR practices of letting thoughts come and go, observing the breath, and body scan. Class discussion included exploring tales from the Zen tradition. Significant improvements were found in academic performance of the participants in Spanish language and literature, foreign languages, and philosophy (the three subjects examined). Students also improved their self-concept and had reduced anxiety.

The authors hypothesized that the academic improvements were causally related to students feeling better about themselves and having less anxiety when studying.

Mindfulness research increasingly includes measures of cognitive performance in the assessed potential outcomes, and school programs are increasingly looking to evaluate their results on academic achievements. Such results, if sustained, will be likely to make mindfulness a good deal more attractive to all mainstream schools, including secondary schools.

Some current developments

We will now explore two key areas in which mindfulness in schools is currently developing, namely linking with social and emotional learning and with staff development.

The "missing key" for SEL

Many in education are suggesting that schools need to do more to educate the heart and character, as well as the intellect. The last few decades have seen schools increasingly focusing on the mental, social, and emotional health and well-being of their students, as well as their academic learning. There is a cluster of social and emotional interventions going under a plethora of names, such as "resilience," "life skills," "character education," mental health, well-being, and, more recently, "flourishing," which attempt to develop this "non-cognitive" side of education. SEL has been defined as "the processes through which children and adults acquire and effectively apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions" (CASEL 2014) and is becoming globally widespread.

The evidence base for the broad thrust of SEL programs' work is sound and the best of the interventions, when well implemented, have been shown to be effective in promoting positive well-being, reducing emotional, behavior, and social problems, teaching social and emotional skills, and enhancing academic learning (Zins et al. 2004). A landmark meta-analysis by Durlak et al. (2011) calculated that the effect sizes from the 207 SEL interventions they reviewed averaged to an 11% improvement in achievement tests overall. There was also a 25% improvement in social and emotional skills and a 10% decrease in classroom misbehavior, anxiety, and depression. The effects tended to be maintained for at least six months after the intervention.

Mindfulness appears to be valuable to add to SEL since it shares many of the goals of SEL, for example self-awareness, emotional regulation, and empathy. As

Shucksmith et al. (2007) concluded in their review of the field, if we look beneath the "branding," effective SEL-type interventions offer a very similar mix of CBT and social skills training for children in self-regulation, and for parents and teachers in appropriate relationship building, classroom management, and better methods of discipline. Mindfulness can be termed the "missing piece" that has the potential to work alongside these worthy but generally cognitive, verbal, and teacher-driven approaches and make them more effective. It can help otherwise rather cerebral approaches take on the new depth that comes from the grounded work of quiet exploration of mind and body; the objectivity that comes with relaxed and acceptant awareness of passing thoughts, feelings, and sensations; and the empowerment that comes from developing the inner self-management techniques required to take charge of one's own growth and development (Lantieri and Nambiar 2012). In return, basing mindfulness within SEL is helpful for the development of mindfulness, ensuring the skills and attitudes that mindfulness meditation is attempting to cultivate are supported by a wider curriculum, which explores cognitive and real-world implications in more "normal" classroom and school activities and methodologies.

Starting with school staff

When developing mindfulness in schools, it is generally accepted that it is important to include (or indeed to begin with) staff, rather than focusing only on young people (Crane et al. 2010). "Staff" in this context includes most obviously teachers, but potentially also others such as support workers, administrative staff, psychologists, therapists, social workers, and youth workers.

Work on the impact of mindfulness on school staff is developing; a recent search resulted in 27 papers on mindfulness and staff, mainly teachers, of which 16 are interventions, with some evaluated examples of success. An example of the CARE program that has shown a range of impacts can be found in Case Study 7.

Staff generally experience direct benefits for their own well-being in line with the well demonstrated impacts of mindfulness on adult mental health problems, such as reduced depression, anxiety, and stress, and an increased sense of happiness, calm, and clear-thinking mindfulness. They are in particular need of this. Working in schools is a particularly tough job, mental health problems are endemic, and the human and financial costs in terms of staff stress, absenteeism, and attrition are high (Brouwers and Tomic 2000). Several well-conducted studies with teachers have shown a reduction in burnout and stress (e.g., Albrecht et al. 2012).

Interestingly, mindfulness also appears to have the attractive benefit of enabling those who work with the young to be more effective in their everyday routine work. It can improve staff core "people skills," such as managing emotion,

staying calm and in control, attuning more empathically to others with greater "presence," managing behavior more effectively, being more flexible and responsive, making better decisions, and staying on track with intentions (Albrecht et al. 2012; Meiklejohn et al. 2012).

Case Study 7: Mindfulness impacts on teacher well-being, stress, and effectiveness in the classroom

The **Cultivating Awareness and Resilience in Education (CARE) program** at the US Garrison Institute (2015) aims to help teachers reduce stress through greater calm and bring greater awareness into the classroom to enhance their relationships with their students, their classroom management, and their curricular implementation. It does this through attempting to promote awareness, presence, compassion, and reflection. The program introduces mindful awareness activities, such as mindful listening, and silent reflection, and includes activities that explore how to bring mindfulness to the challenging situations teachers often encounter.

The CARE program has been subject to an RCT of 50 teachers (Jennings et al. 2013), which showed that participation resulted in significant improvements in teacher well-being, efficacy, burnout/time-related stress, and mindfulness compared with controls. Qualitative data showed that teachers felt CARE reduced stress and improved their own performance, and they reported that their students spent more time on task and showed improvements in academic performance.

On the strength of this growing evidence, interventions for teachers and others who work with the young are developing apace. An all-party parliamentary committee in the UK (New Economics Foundation 2014) has recommended that mindfulness be incorporated into basic training of the teaching profession.

Conclusions and recommendations for future actions

For those already engaged in mindfulness in schools

There is a strong need for better quality research. Priorities are larger studies with more power, using an RCT design and longer follow-up, better and more consistent and standardized measures, and a greater use of real-world measures such as tests of performance rather than just self-report. Enhancing the research base will bring toughness and clarity, increase comprehensibility by the public, and improve acceptability to commissioning and funding agencies that favor 'evidence-based' approaches (Shadish et al. 2001).

However, there is a balance to be struck. The view of mindfulness as simply a set of separate controlled interventions comes from the world of medicine, an approach that is known to have major limitations when applied to complex social organizations such as schools (Vogt et al. 2011). It is not a particularly useful guide for how mindfulness is actually likely to have most benefit in schools

and in the lives of the young in the long run, which is integrated into the fabric of school life. We must take care that the research tail does not wag the dog.

There is clear evidence that teaching of emotional and social skills has greater and longer-term impact when skills are integrated into the general classroom curriculum and staff development as a whole, and reinforced in all interactions across the school (Adi et al. 2007; Berkowitz and Bier 2007). Current developments in promoting well-being favor taking a "whole school approach," a multi-component view of school that takes in and uses the totality of the school experience to promote well-being. Research over many decades has shown that multi-component approaches are more effective in promoting social and emotional well-being than those that focus on only one or two parts of school life.

In an authentic "whole school approach," well-being and mental health are "everyone's business," with genuine involvement of all parts of the school, including all staff, pupils, governors, parents, the community, and outside agencies. The fact that such approaches have proved hard to evaluate, due to their complexity and multi-causal nature, does not make them any less worthwhile.

There is considerable good quality research that has identified the key evidence-based elements of an effective whole school approach across a range of empirical studies and reviews (e.g., Adi et al. 2007; Berkowitz and Bier 2007; Shucksmith et al. 2007; Weare and Nind 2011). Effective whole school approaches are founded on a sound, warm, and positive school climate and ethos, underpinned by strong human values, played out through humane and consistent school relationships, policies, and procedures, supported by effective skills-based work in the classroom and in teacher education, and with the genuine and coordinated engagement of parents, the community, and supportive agencies (Durlak et al. 2011). Mindfulness, with its holistic approach to human experience, its emphasis on hearts as well as minds, and its focus on the development of practical human skills, has an integral part to play in achieving this vision.

For those new to mindfulness

Those new to mindfulness, including head teachers and policy makers, might like to look into the now fairly convincing evidence from practice and research studies and consider its potential to impact not only on the mental health and well-being of their students and staff, but also on their core business of improving the quality of students' learning and staff teaching. When a well-designed program is well taught, the consensus is clear that schools find mindfulness attractive, acceptable, easy to integrate into a range of contexts, cost-effective, and a relatively quick way to help students and staff face the many challenges and choices the modern world throws at them.

However, mindfulness, although good value for the time and money invested in it, has to be of sufficient quality, and "any old" mindfulness will not do—it is not a rock-bottom, cheap and easy option to be delivered by anyone with the help of a script or CD that then brings overnight miracles. The evidence for mindfulness comes from high-quality programs, taught by educated trainers with a regular personal practice, and there is no evidence that more random or dilute interventions are effective. Programs need to be selected with care, good quality trainers employed, time allowed for it to take effect, and there should be realistic expectations of modest gains.

Those in schools who would teach mindfulness need to learn it themselves, so they understand its somewhat paradoxical and non-traditional processes from within and model the core attitudes of open-minded non-judgmentalism in an authentic and convincing way (Albrecht et al. 2012; Crane et al. 2010). The analogy is often made with swimming: You would not expect to learn to swim from someone who had never encountered the physicality of water or the bodily and emotional experience of swimming in it. Heads and policy makers might at least have a go at studying mindfulness themselves, to explore its personal value and appreciate the need for courses to be taught by those with sufficient training and commitment to understand it from within.

Those who take to mindfulness, and this particular route is not for everyone, will almost certainly find it helps them to experience, model, and embody the particular qualities that mindfulness develops, such as flexibility, attention, open-minded curiosity, kindliness, empathy, compassion, acceptance, and patience, in their everyday interactions with colleagues and children. These are not "odd," left-field qualities, they are the skills and attitudes to which most educators aspire but that few of us have naturally, and underlie all effective engagement with young people.

Through mindfulness, and the stilling and calming practices it engenders, schools are starting to help staff and students look inwards as well as outwards, and manage their minds in a quiet but effective manner that offers new hope to schools and young people. It is well worth the consideration of anyone involved in the education of the citizens of tomorrow.

We end with two specific but fairly typical quotations from those who have experienced a mindfulness course:

> I tend to use Mindfulness to create pauses in my day. The sessions I hold for students are part of my own formal practice, but I do a lot of mindful eating, showering, as well as more *'heavy meditation'*—20–30 mins sitting session—but not as often as I should. Mindfulness practice definitely makes me less reactive and more responsive and also proactive (instead of moaning). It also has a calming effect around me—students and colleagues.
>
> A-Level Mathematics teacher (Weare 2015)

> I've been unsuccessfully trying to think of some witty comment that would encourage other students to practice it, but all I can say is that it gives me the chance to reach my full potential in all situations in life. With mindfulness I have an option out of the crippling fear, shakes and anxiety that set me back and the chance to believe that I could achieve my potential . . . The time I've invested in mindfulness has proven to be one of the best choices that I've made.
>
> Student on a performing arts course (Mindfulness for Students 2015)

Personal Meditation Journey

I had practiced yoga regularly for most of my adult life off and on, starting with the weird line diagrams from *Teach Yourself Yoga* at a time when no-one I knew was at all interested. I have no idea why it attracted me but I approached it as a form of physical exercise, and the striving and competitive way I tackled it is about as far from mindfulness as it is possible to get. I was totally impatient with the breathing and relaxation, just wanting to get to headstands. However, despite myself, I found the classes had calming and somewhat "other worldly" effects. At one point I wandered into a Buddhist meditation class and spent an hour doing *metta* practice (I now realize), which led to an extraordinary, blissful—and, it transpired, sadly one-off—transcendental experience of feeling at one with all beings for much of the following day. I thus had meditation on my bucket list, aware that my driven, perfectionist, and somewhat overbearing personality would benefit from some kind of antidote, but one day, not yet.

In 2002, in the middle of a successful academic career and a thriving social and personal life, I hit the buffers—as so many people do. My husband and I had adopted a family of three children who were eight, seven, and three—blithely imagining our competent personas would enable us to rise above the gloomy prognostications and produce a happy, balanced family of (possibly grateful!) children. Laughable in retrospect, and the stress of the reality of dealing with early trauma and the sequelae of attachment disorder and mental health problems (in all five of us) was almost certainly what led to the development of a mysterious and barely understood autoimmune condition. This condition, complex regional pain syndrome (CRPS), is pretty well impervious to any treatment or even painkillers, prevented me from walking, was constantly and excruciatingly painful, and was spreading. In the depths of suicidal despair, in the face of a problem no-one could "fix," I was directed to mindfulness by a pain specialist, who himself had no experience of it but had heard it was helpful. I tracked down a local and wonderful calm, patient teacher, Mark Bowden, and began the journey into mindfulness—starting with one-to-one sessions—which saved my life, and did so much else.

My day one discovery was the extraordinary ball of physical tension that constituted my body, followed by the dawning realization that I had been driving myself and the rest of my family into the ground with unsurfaced neuroses from my Catholic childhood and deep-rooted mind-states of shame, guilt, self-dislike, and striving. In the face of gentle mindfulness practice, the pain and the CRPS condition started subsiding fairly quickly to become manageable, and have diminished steadily since so that now they are hardly present. I experienced the "eight-week course" several times over, and resigned from my post at the university to focus on my personal life, as all this was far more compelling than becoming Dean of the Faculty. I enrolled in the University of Exeter's postgraduate diploma in Mindfulness-based Approaches to train as a mindfulness teacher.

Since then I have taught and practiced mindfulness "as best I can" in a wide variety of settings. My professional life has revived but now with mindfulness integrated into it (my specialty is child well-being and social and emotional learning, so the links are pretty obvious). Trained at the University of Exeter, I am working to develop teaching and research on mindfulness in schools in various contexts and to move it into public consciousness. In the course of this work I have been fortunate to work alongside some extraordinary people, in academia, in schools, and in the contemplative world. They include my fellow Exeter students, now colleagues, and particularly the redoubtable Willem Kuyken, Professor at the University of Oxford and role model of the mindful approach to a huge workload and the longed-for ability to write cryptic e-mails. Also the phenomenal minds and authentic presence behind the UK mindfulness in schools program, Chris Cullen and Richard Burnett. Thich Nhat Hanh's Plum Village monastics, who are the sanest people I have met. The quiet wisdom of the staff from Mind and Life, such as Arthur Zajonc, and the talented people their meetings attract, such as the brilliantly gritty Guy Claxton. I sit with the effort to find them all inspirational, but noting my "imposter complex" arising constantly.

It is not all nirvana. I struggle with deep aspects of my own shame and guilt, which come to greet me on the cushion, especially during lengthy retreats, my impulsiveness, and my ingrained tendency to turn everything into smart-ass words. I try to use mindfulness myself, to help my children and arrive in a state of calmness. And mostly I manage it, in the face of some extraordinary difficulties, although sometimes the attunement and openness of mindfulness goes the other way and I find myself being drawn into their trauma, self-dislike, and brain fog, with which my mind can easily resonate. I remind myself that writing about and talking about mindfulness do not in themselves constitute mindfulness, and you do actually have to do the daily practice if you are to be able to live it. I remind myself that mindfulness is not the universal panacea, that it will not in itself make you thinner, fitter, and on top of your workload; that it can alienate friends if it turns to smugness; and that it works best if part of a balanced life. The best

single piece of advice I have is from the calligraphy from Thich Nhat Hanh on the wall over my bed—smile and breathe—and if I do nothing else in the day that is at least the way it starts.

References

Adi, Y., Killoran, A., Janmohamed, K., and Stewart-Brown, S. (2007). *Systematic review of the effectiveness of interventions to promote mental wellbeing in primary schools: Universal approaches which do not focus on violence or bullying.* London: National Institute for Clinical Excellence.

Albrecht, N. J., Albrecht, P. M., and Cohen, M. (2012). Mindfully teaching in the classroom: A literature review. *Australian Journal of Teacher Education*, **37**(12), article 1.

Baer, R. A. (Ed.). (2006). *Mindfulness-based treatment approaches: Clinical guide to evidence base and applications.* London: Elsevier Academic Press.

Barnes, V., Bauza, L., and Treiber, F. (2003). Impact of stress reduction on negative school behaviour in adolescents. *Health and Quality of Life Outcomes*, **1**, 7. doi:10.1186/1477-7525-1-10

Beauchemin, J., Hutchins, T. L., and Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills and improve academic performance amongst adolescents with learning difficulties. *Complementary Health Practice Review*, **13**, 34–45.

Berkowitz, M. W. and Bier, M. C. (2007). What works in character education? *Journal of Research in Character Education*, **5**, 29–48.

Biegel, G. (2009). *Stress reduction workbook for teens.* Oakland: Instant.

Biegel, G. M., Brown, K. W., Shapiro, S. L., and Schubert, C. M. (2009). Mindfulness-based Stress Reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, **77**(5), 855–866.

Bogels, S., Hoogstaf, B., Van Dun, L. et al. (2008). Mindfulness training for adolescents with externalizing disorders and their parents. *Behavioural and Cognitive Psychotherapy*, **36**(2), 193–209.

Brouwers, A. and Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher Education*, **16**(2), 239–253.

CASEL (2014). *SEL defined.* [Online] Available at: http://www.casel.org/social-and-emotional-learning/ [Accessed September 3, 2015].

Ciarrochi, J., Kashdan, T. B., Leeson, P. et al. (2010). On being aware and accepting: A one year longitudinal study into adolescent well-being. *Journal of Adolescence*, **34**(4), 695–703.

Crane, R. S., Kuyken, W., Hastings, R. P. et al. (2010). Training teachers to deliver mindfulness-based interventions: Learning from the UK experience. *Mindfulness*, **1**(2), 74–86.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience.* New York: Harper & Row.

Davidson, R. and Lutz, A. (2008). Buddha's brain: Neuroplasticity and meditation. *IEEE Signal Processing Magazine*, **25**(1), 176–174. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944261/ [Accessed January 30, 2012].

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B. et al. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, **82**, 474–501.

Farrell, L. and Barrett, P. (2007). Prevention of childhood emotional disorders: Reducing the burden of suffering associated with anxiety and depression. *Child and Adolescent Mental Health*, **12**(2), 58–65. doi:10.1111/j.1475-3588.2006.00430.x

Flook, L., Smalley, S. L., Kitil, M. J. et al. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology*, **26**(1), 70–95.

Franco, C., Mañas, L., Cangas, J. A., and Gallego, J. (2011). Exploring the effects of a mindfulness program for students of secondary school. *International Journal of Knowledge Society Research*, **2**(1), 14–28.

Garrison Institute (2015). *The CARE program*. [Online] Available at: http://www.garrisoninstitute.org/contemplation-and-education/care-for-teachers [Accessed February 1, 2015].

Goleman, D. (1996). *Emotional intelligence: Why it can matter more than IQ*. London: Bloomsbury.

Goleman, D. (2013). *Focus, the hidden driver of excellence*. New York: Harper Collins.

Goyal, M., Singh, S., Sibinga, E. et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, **174**(3), 357–368. doi:10.1001/jamainternmed.2013.13018

Greenberg, M. T. and Harris, A. R. (2012). Nurturing mindfulness in children and youth: Current state of research. *Child Development Perspectives*, **6**, 161–166. doi:10.1111/j.1750–8606.2011.00215.x

Haydicky, J., Wiener, J., Badali, P. et al. (2012). Evaluation of a mindfulness-based intervention for adolescents with learning disabilities and co-occurring ADHD and anxiety. *Mindfulness*, **3**, 151–164.

Holistic Life Foundation (2014). Home page. [Online] Available at: http://hlfinc.org/ [Accessed April 29, 2014].

Hölzel, B. K. Carmody, J., Vangel, M. et al. (2011a). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research Neuroimaging*, **191**(1), 36. doi:10.1016/j.pscychresns.2010.08.006

Hölzel, B., Lazar, S., Gard, T. et al. (2011b). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, **6**, 537. doi:10.1177/1745691611419671

Huppert, F. A. (2014). The state of well-being science: Concepts, measures, interventions and policies. In F. A. Huppert and C. L. Cooper (Eds.). *Interventions and policies to enhance well-being*. Oxford: Wiley-Blackwell.

Jennings, P. A., Frank, J. L., Snowberg, K. E. et al. (2013). Improving classroom learning environments by cultivating awareness and resilience in education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly*, **28**(4), 374–390.

Kabat-Zinn, J. (1996). *Full catastrophe living*. London: Piatkus Books.

Kaiser-Greenland, S. (2009). *The mindful child*. London: Simon and Schuster.

Kerrigan, D., Johnson, K., Stewart, M. et al. (2010). Perceptions, experiences, and shifts in perspective occurring among urban youth participating in a mindfulness-based stress reduction program. *Complementary Therapies in Clinical Practice*, **17**(2), 96–101.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behaviour*, **43**, 207–222.

Kuyken, W., Weare, K., Ukoumunne, O. et al. (2013). Effectiveness of the mindfulness in schools program: A non-randomized controlled feasibility study. *British Journal of Psychiatry*, **203**(2), 126–131. Available at: http://bjp.rcpsych.org/content/203/2/126.full.pdf+html

Langer, E. (1993). A mindful education. *Educational Psychologist*, **28**(1), 43–50.

Lantieri, L. and Nambiar, M. (2012). *Social emotional learning and mindfulness-based contemplative practices in education*. [Online] Available at: http://whatmeditationreallyis.com/index.php/home-blog/item/380 [Accessed February 10, 2014].

Learning to Breathe (2014). *A mindfulness curriculum for adolescents*. [Online] Available at: http://learning2breathe.org/ [Accessed February 15, 2014].

LeDoux, J. (1998). *The emotional brain*. New York: Simon and Schuster.

Lillard, A.S. (2011). Mindfulness practices in education: Montessori's approach. *Mindfulness*, **2**, 78–85. doi:10.1007/s12671-011-0045-6

Ma, S. and Teasdale, J. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse prevention effects. *Journal of Consulting and Clinical Psychology*, **72**(1), 31–40.

Meiklejohn, J., Phillips, C., and Freedman, M. L. (2012). Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students. *Mindfulness*, **3**(4), 291–307.

Mendelson, T., Greenberg, M. T., Dariotis, J. K. et al. (2010). Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth. *Journal of Abnormal Child Psychology*, **38**(7), 985–994.

Mental Health Foundation (2014). *Mental health statistics and children*. [Online] Available at: https://www.google.co.uk/search?q=mental+health+statisics+children&sourceid=ie7&rls=com.microsoft:en-GB:IE-Address&ie=&oe= [Accessed February 10, 2014].

Metz, S., Frank, J. L., Reibel, D. et al. (2013). The effectiveness of the learning to breathe program on adolescent emotion regulation. *Research in Human Development*, **10**, 252–272. doi:10.1080/15427609.2013.818288

Mind and Life (2014). Ethics, education and human development. [Online] Available at: http://www.mindandlife.org/research-and-initiatives-category/ethics-education-human-development/ [Accessed February 2, 2014].

Mind with Heart (2014). *Cultivating mindfulness and empathy in teaching*. [Online] Available at: http://www.mind-with-heart.blogspot.fr/p/training-for-educators.html [Accessed April 29, 2014].

Mindfulness for Students (2015). [Online] Available at: http://mindfulnessforstudents.co.uk/students/student-testimonials/ [Accessed February 2, 2015].

Mindfulness in Schools (2014). *The mindfulness in schools project*. [Online] Available at: http://mindfulnessinschools.org/ [Accessed February 10, 2014].

Napoli, M., Krech, P. R., and Holley, L. C. (2005). Mindfulness training for elementary school students: The attention academy. *Journal of Applied School Psychology*, **21**(1), 99–125.

National Research Council and Institute of Medicine (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academy Press.

New Economics Foundation (2014). *Wellbeing in four policy areas: Report by the All-Party Parliamentary Group of Wellbeing Economics*. London: New Economics Foundation. Available at: http://www.neweconomics.org/publications/entry/wellbeing-in-four-policy-areas [Accessed February 2, 2015]

NICE (National Institute for Health and Care Excellence) (2009). *Depression: The treatment and management of depression in adults*. London: NICE.

Schonert-Reichl, K. A. and Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre- and early adolescents' well-being and social and emotional competence. *Mindfulness*, **1**(3), 137–151.

Semple, R. J., Reid, E. F., and Miller, L. (2005). Treating anxiety with mindfulness: An open trial of mindfulness training for anxious children. *Journal of Cognitive Psychotherapy*, **19**(4), 379–392.

Shadish, W. R., Cook, T. D., and Campbell, D. T. (2001). Experimental and quasi-experimental designs for generalized causal inference, 2nd edition. Florence, KY: Wadsworth.

Shucksmith, J., Summerbell, C., Jones, S., and Whittaker, V. (2007). *Mental wellbeing of children in primary education (targeted/indicated activities)*. London:National Institute of Clinical Excellence.

Sibinga, E. and Stewart, M. (2008). Mindfulness-based stress reduction for HIV infected youth: A pilot study. *Explore*, **4**, 36–37.

Vogt, W., Gardner, D., Haeffele, L., and Baker, P. (2011). Innovations in program evaluation: Comparative case studies as an alternative to RCTs. In M. Williams and P.Vogt (Eds.). *The SAGE handbook of innovation in social research methods*, pp. 293–324. London: Sage.

Wake Up Schools (2014). *Cultivating mindfulness in education*. [Online] Available at: http://wakeupschools.org/ [Accessed February 2, 2015].

Weare, K. (2015). Evidence for mindfulness: Impacts on the wellbeing and performance of school staff. [Online] Available at: http://mindfulnessinschools.org/wp-content/uploads/2014/10/Evidence-for-Mindfulness-Impact-on-school-staff.pdf [Accessed February 2, 2015].

Weare, K. and Nind, M. (2011). Mental health promotion and problem prevention in schools: What does the evidence say? *Health Promotion International*, **26**(S1), 29–69.

Williams, M. and Penman, D. (2011). *Mindfulness: A practical guide to finding peace in a frantic world*. London: Piatkus.

Woodruff, S. C., Arnkoff, D. B., Glass, C. R., and Hindman, R. K. (2014). Mindfulness and anxiety. In A. Ie, C. T. Ngnoumen, and E. J. Langer (Eds.). *The Wiley Blackwell handbook of mindfulness*, pp. 732–754. Chichester, England: John Wiley & Sons.

Zenner, C., Herrnleben-Kurz, S., and Walach, H. (2014). Mindfulness-based interventions in schools—a systematic review and meta-analysis. *Frontiers in Psychology*, **5**, 603. doi:10.3389/fpsyg.2014.00603

Zins, J. E., Weissberg, R. P., Wang, M. C., and Walberg, H. (2004). *Building academic success on social and emotional learning*. New York: Columbia Teachers College.

Zoogman, S., Simon, B., Goldberg, S. et al. (2015). Mindfulness interventions with youth: A meta-analysis. *Mindfulness*, **6**(2), 290–302. doi:10.1007/s12671-013-0260-4

Zylowska, L., Ackerman, D. L., Yang, M. H. et al. (2007). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *Journal of Attention Disorders*, **11**(6), 737–746.

Part 4

Conclusions

Meditation: Future theory and research

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Introduction

Meditating improves relationships, reduces anxiety and negative emotions, and strengthens positive aspects of personality; it helps people stay more concentrated and boosts learning and memory. These are just some effects found in a comprehensive meta-analysis that summarized the psychological effects of meditation for healthy adults found in 163 studies (Sedlmeier et al. 2012). Another recent meta-analysis that examined the effects of meditation (mostly mindfulness meditation) on stress-related outcomes (e.g., anxiety, depression, stress, distress, well-being, positive mood, quality of life, and stress-related pain) also found moderate effects in diverse adult clinical populations when compared to nonspecific active controls (Goyal et al. 2014). Why does meditation have these beneficial consequences? The sobering answer to this question is that we do not know, despite the fact that there have been many studies on the effects of meditation. These studies differ widely in focus and methods but almost all contain little or no theoretical background. This lack of theory and, consequently, of precise hypotheses has led researchers to look at how meditation changes a wide range of both physiological and psychological measures. Although the psychological (beneficial) effects can be regarded as established, results in brain research are not clear-cut. There is some indication that meditation affects brain processes and even brain structure (e.g., Cahn and Polich 2006; Clausen et al. 2014; Fox et al. 2014) but as yet there is no satisfactory theoretical account for these changes.

There have been attempts to explain how meditation works but these explanations have not been precise enough to allow for stringent empirical tests and have, for the most part, been ignored by researchers examining the effects of meditation. Advancing the theory of meditation, we suggest, is the most important task in meditation research. More trial-and-error research will not

yield a better understanding of the processes and effects of meditation. It can, however, offer hints for where to look. For instance, our recent meta-analysis (Sedlmeier et al. 2012) found diverging effect sizes for different variables. Large effects, according to Cohen's (1988) standards, were found for improvement of relationships ($d = 0.89$), reduction of anxiety ($d = 0.80$), and decrease of negative emotions ($d = 0.73$). Medium-sized effects were found for measures of mindfulness, perception, and attention (all three $d = 0.58$). And somewhat smaller, though still substantial, effects were found for improvements in learning and memory ($d = 0.43$), decreases in negative personality traits ($d = 0.37$), and emotion regulation ($d = 0.35$). Why these differences? It might be that meditation has its strongest effects on reducing negative emotions and thereby also affects other areas, such as relationships and cognitive functioning. However, the size of effects does not necessarily have to be an indicator for the causal strength; it could also be that even moderate effects on attention may yield changes in many other areas, because meditators could become more aware of their emotions and more focused on their tasks. Again, we do not know yet.

The meta-analysis also identified another important source of variation: The type of meditation practiced. Because only a few studies were conducted for each of the meditation techniques, categorization of meditation types was coarse and yielded only three categories: Transcendental Meditation (TM); mindfulness meditation; and a third category, into which all remaining techniques were placed. Although these three categories did not differ in their overall effects, pronounced differences showed up if effects for specific variables were compared. TM exhibited comparatively large effects for the reduction of negative emotions, anxiety, and for learning and memory; mindfulness meditation techniques yielded higher effects than the other two categories for the reduction of negative personality traits, stress reduction, and the improvement of attention and mindfulness; and the "other" category had a comparatively strong effect on measures of cognitive ability. There are even pronounced differences in effects *within* specific categories of meditation, such as mindfulness meditation. For instance, Eberth and Sedlmeier (2012) found in their meta-analysis on mindfulness meditation that "pure" mindfulness meditation yielded larger effects on variables associated with the concept of mindfulness than techniques that also included some bodily components (MBSR), but that practitioners of the latter attained higher psychological well-being.

These results suggest that theories of meditation might need to be technique specific: Different meditation techniques might achieve effects through different mechanisms. This lack of commonality might also hold for people: Different meditators might profit differentially from a given approach. A useful

theory of meditation would specify precise hypotheses about what effects to expect for different kinds of approaches and different kinds of people.

Another problem of meditation research is deficient research methods. In our meta-analysis (Sedlmeier et al. 2012) we found 595 studies that satisfied a first screening (adult meditators from non-clinical populations, with only or mainly psychological effects reported) but the number of studies that could be used in the meta-analysis was reduced to 163, largely because of methodological problems (e.g., no control group, no effect sizes calculable due to missing information). A similar selection process had to be performed by Goyal et al. (2014). This indicates a general need for improving methodological skills in meditation research. There is also a need to develop better techniques of measurement, including qualitative methods, to capture facets of the processes involved in meditation for which no questionnaires or established methods of measurement so far exist (Sedlmeier 2006; 2014). Apart from problems of measurement, the usual group-comparison designs in meditation research also have their limits and can cause problems, such as too few individuals to serve as participants for a specific research question or difficulty in finding a suitable control group. This calls for some rethinking about useful research designs.

In this chapter, we deal with all three problems of current meditation research outlined earlier: Deficient theorizing; unsatisfactory measurement; and suboptimal research designs (see also Goyal et al. 2014; Ospina et al. 2007). We begin with suggestions for how theorizing in the field can be improved. Then we propose better ways to measure effects, and finally we discuss the issue of research design in meditation research. It will become evident that these three issues are closely interconnected.

Toward better theories

There are at least three possible starting points for the development of a comprehensive theory of meditation. First, it would be useful to summarize and seek a synthesis of Western approaches to explaining the effects of meditation. Second, it seems worthwhile to examine the ancient (mostly Indian) philosophical theories in which meditation is embedded. And third, valuable insights might be gained from questioning experienced practitioners of meditation.

Western explanations

An early Western explanation of how meditation works was that it was simply a relaxation technique that yields a "relaxation response" (Benson et al. 1974). Although it seems plausible to assume that meditation techniques have relaxing effects (among others), empirical evidence shows that the effects of meditation

on basically all psychological variables exceed the effects of standard relaxation techniques (Sedlmeier et al. 2012). Moreover, recent findings indicate that at least some meditation techniques might not yield relaxation effects at all (Amihai and Kozhevnikov 2014; Lumma et al. 2015). So, the "mere relaxation" explanation can be refuted on empirical grounds.

Most Western theoretical approaches to meditation center on attentional processes and their effects. For instance, Lutz et al. (2008) suggested different effects for meditation techniques that focus attention on a process (e.g., the breath) or object (e.g., a mantra) and those that cultivate open awareness (i.e., staying mindful to all sensations and cognitions that come up without becoming attached to them). They proposed that focused meditation benefits the monitoring faculty that notices potential distractions, alleviates disengagement from a distracting object without further involvement, and increases the ability to redirect the focus of attention to the chosen object. On the other hand, meditation techniques that emphasize open monitoring increase vigilance and the ability to be attentive moment by moment to anything that occurs in experience without focusing on any explicit object.

Shapiro et al. (2006) argued that mindfulness meditation improves sustained attention, deliberate switching between objects or mental contents, and cognitive inhibition of undesirable thoughts, emotions, and sensations. Similarly, Hölzel et al. (2011) postulated improvement in attention regulation, body awareness, emotion regulation, and a change in perspective on the self. Improvement of one's awareness and attention helps in quickly coming back to the present moment (Brown et al. 2007). Focusing attention on experience in the present moment, it is suggested, eventually leads to a less biased reappraisal of experiences and better emotion regulation, and to a "meta-cognitive awareness." This meta-cognitive awareness allows meditators to disidentify from thoughts and emotions and to come to see them not as aspects of the self but simply as mental events (Baer 2009; Coffey et al. 2010; Garland et al. 2009; Teasdale et al. 2002; Teper et al. 2013). There have also been attempts to connect these and similar postulated results to neurobiological mechanisms (Vago and Silbersweig 2012). These attempts to explain the effects of meditation within the context of cognitive psychology are promising, but as yet they have dealt mainly with one kind of meditative practice (mindfulness meditation), have mostly centered on a limited selection of potentially relevant processes, and have usually not been well connected to or embedded in theories and research in cognition (see Claxton's Chapter 3 in this volume for a notable exception).

Eastern explanations

Meditation as practiced today is almost always embedded in a spiritual context that, in most cases, can be traced back to an ancient Indian origin. Therefore,

the literature deriving from that spiritual context also contains theories of meditation. Of course, such theories are not purely psychological because they have religious and philosophical content that Western scholars struggle with. Another problem is that they were mostly developed more than 1000 years ago and are often written in an "awkward" style and in languages such as Sanskrit and Pali that produce ambiguities when translated into contemporary Western languages. Nonetheless, the basis for most of these theories is as empirical as can be, as they can be assumed to be based on the experiences of what one nowadays would probably call "very experienced meditators" (e.g., Olendzki 2010; see also Batchelor's Chapter 2 in this volume).

There have been some attempts to describe these theories for Western meditation researchers. For instance, Lutz et al. (2007) described in detail three kinds of practice recommended in a particular strand of Tibetan Buddhism and explicated hypotheses about what can be expected from each. In another attempt to make Eastern theories available to Western researchers, Grabovac et al. (2011) "translated" theoretical aspects contained in a Burmese version of Theravada Buddhism into a cognitive model. A more comprehensive approach was used by Sedlmeier and Srinivas (2015). They extracted the psychological theories of cognition from two ancient Indian thought systems: (early) Buddhism; and Sankhya-Yoga. These theories not only deal with meditation but are cognitive theories that embed meditation in a broader theoretical context. Interestingly, these theories also contain hypotheses that go beyond current Western mainstream psychology, especially concerning questions of consciousness (e.g., the assumption of "pure consciousness" that is non-intentional) and the mind–brain relationship (mind works independently of the brain).

We recommend not disregarding these Eastern explanations that stem from empirically grounded insights gathered over millennia. Instead, an attempt should be made to derive from them and to make these hypotheses (e.g., that mind is not merely an epiphenomenon of the brain but instead uses it as a tool) as precise as possible (see Sedlmeier 2014 for more examples of such hypotheses).

Self-reports of experienced meditators

Most meditation techniques can be seen as practice in introspection. Therefore, one should expect experienced meditators to have very high introspective accuracy because of their improved attentional capacity and cognitive control (e.g., Cornelissen 2011; Lutz et al. 2008), an expectation that is backed by some empirical evidence. For instance, Fox et al. (2012) examined meditation practitioners with a range of 1–15,000 hours of meditation experience and found that overall meditation experience was a good predictor for individual introspective accuracy. The results of introspection by very experienced meditators were the

main source for the theories of meditation contained in Indian texts. So, it seems reasonable that contemporary experienced meditators would also be a profitable source for the development of a theory of meditation. There is already an abundance of such accounts in the books written by spiritual teachers, but there are several pitfalls if introspection is done without some outside control. It might, for instance, be difficult to separate one's own experiences from information and insights taken from other sources (books, conversations with teachers and fellow meditators, interpretations of experiences, etc.). To access theory-relevant knowledge of experienced meditators successfully, researchers probably need at least some basic meditation experience and special (learnable) skills in guiding unbiased introspection (Vermersch 1999; Wallace 1999).

First attempts to extract a theory of meditation in this way indicate that meditators' introspections are largely consistent with Indian theoretical approaches but go well beyond book knowledge (Eberth et al. 2015a). In general, this method seems to be a good complement to both the theories extracted from ancient Indian thought systems and Western approaches to explaining meditation. Obviously, such an approach is restricted to mental processes we have access to, but this access is potentially far better than usually assumed. For instance, Petitmengin-Peugeot (1999) demonstrated that people can be guided to become aware of the process of intuitive experiences, and Petitmengin et al. (2013) showed that expert guidance greatly facilitated the detection of decision processes that people are usually unaware of.

How can we proceed?

We have proposed three ways to arrive at better theories of meditation. One could begin with trying to find a unifying framework for the Western approaches by asking if attentional processes are at the core of the mechanisms involved in meditation (as we interpret the existing literature) or if there are several (partially independent) basic mechanisms, such as direct effects of meditation on emotional or cognitive processes that interact with each other. The different Eastern approaches to explaining the effects of meditation should be made more precise and an effort should be made to connect them to the Western theoretical approaches, complemented by the self-reports of contemporary experienced meditators.

As almost all major forms of meditation are embedded in a spiritual context, future theories of meditation should include assumptions about the role of such a context (Sedlmeier et al. 2014). Possible functions of the spiritual context could be help and motivation in overcoming times of doubt or difficulties meditators experience in their practice. It could also serve as a framework that allows for meaningful interpretations of meditation experiences and it might, especially if

a personal good is involved in the framework, provide solace in times of crisis. It seems that different spiritual contexts fit different people and, therefore, future theories should also take personality factors into account, as well as social and environmental factors, so that it might eventually be possible to make recommendations as to which meditation technique fits a given person best.

Toward better measurement

In the earlier studies on the effects of meditation, many different measurements have been used, often indiscriminately. A theory-guided use of specific measurements and methods is promising for furthering our understanding of meditation along with innovation in research. Conventional measurements such as questionnaires reach their limits in meditation research, especially if one wants to measure hitherto neglected effects among experienced meditators that are expected to arise with increasing practice. Here, one needs custom-tailored kinds of measurement that will often be of a qualitative nature. However, there are already several questionnaires that have been developed from a Buddhist or Hindu theoretical background and might prove to be useful in meditation research. We give a short overview of these instruments and then turn to some suggestions for how measurement could be custom-tailored to meditation research.

Conventional measurement

Most meditation techniques come from a Hindu or Buddhist context and at least some of the theoretical concepts can be made measurable. In particular, there have been several attempts to develop questionnaires that measure aspects of personality described in Hindu thought systems, the three *gunas*. There have also been several measures of a central concept in Buddhist practice: Mindfulness. In addition, Buddhism also suggests a "personality theory" that can be operationalized using conventional questionnaire techniques.

Guna questionnaires

According to the ancient Indian thought system of Sankhya, people are composed of three "qualities," (three *gunas*)—*sattva* (purity), *rajas* (energy), and *tamas* (inertia)—which, in their specific mixture, are the basis of a person's personality (Dasgupta 1930; Jha 2008). According to Sankhya, people with a high level of *sattva* are balanced and mindful, frequently experience positive emotions, and are satisfied with their lives. They are enthusiastic and persevering. People with a high level of *rajas* frequently feel stressed and sorrowful; they are often restless and dissatisfied, pursue money and status, and tend to be selfish in social relationships. Finally, people with a high level of *tamas* lack enthusiasm

and energy. They are pessimistic and postpone tasks and problem solving; they frequently experience negative emotions and are dissatisfied with their lives. However, the mixture of the three qualities is not seen as stable and the aim should be to increase the level of *sattva*: Only if *sattva* is dominant will a person be able to achieve well-being and higher spiritual aims.

Empirical evidence, mostly collected by Indian psychologists, indicates some connections between the concept of the three *gunas* on the one side and issues of illness, psychological well-being, and spirituality on the other. The results of this research are broadly supportive of the Hindu assumptions (for an overview, see Puta and Sedlmeier 2014). For example, *sattva* correlated positively with experiencing positive emotions and self-discipline (Hopkins 2003), short-term memory and concentration (Sitamma 2005), personal effectiveness and self-actualizing behavior (Kaur and Sinha 1992), and daily spiritual experiences (Stempel et al. 2006), and negatively with impulsiveness, neuroticism, and a vulnerability to stress (Hopkins 2003), attention and thought problems, aggressive behavior (Archana Das and Venu Gopal 2009), phobic anxiety, and feelings of personal inferiority and inadequacy (Stempel et al. 2006).

Studies have also demonstrated the negative effect of dominant *rajas* and/or *tamas* on health. Both *rajas* and *tamas* correlate positively with attention and thought problems (Archana Das and Venu Gopal 2009), a vulnerability to stress, neuroticism, angry hostility, and impulsiveness (Hopkins 2003), and anxiety (Stempel et al. 2006), and negatively with the frequent experience of positive emotions and self-discipline (Hopkins 2003) and daily spiritual experiences (Stempel et al. 2006). Furthermore, studies show that *tamas* correlates positively with occupational stress (Daftuar and Anjuli 1997), psychoticism, depression, and phobic anxiety (Stempel et al. 2006), aggressive behavior, and somatic problems (Archana Das and Venu Gopal 2009), and negatively with short-term memory and concentration (Sitamma 2005). In a recent study, Puta and Sedlmeier (2015) found further evidence of the relatedness of the *gunas* to well-being: *Sattva* correlated positively and *rajas* and *tamas* negatively with life-satisfaction, positive emotions, physical well-being, work engagement, and calmness, whereas *sattva* correlated negatively and *rajas* and *tamas* positively with depressiveness, stress, anger, and tumultuousness.

Several questionnaires have been developed to measure the concept of the *gunas* but their quality is poor. All the questionnaires (with one exception: Shilpa and Murthy 2012) have operationalized only part of the theoretical model. Furthermore, only two attempts have been made to examine the factor structure of the questionnaires, one pointing at the need for further research (Wolf 1998) and the other yielding an extremely short 13-item scale with three factors that can each be attributed to a respective *guna* (Bhal and Debnath

2006). Puta and Sedlmeier (2015) attempted to overcome these limitations by constructing a questionnaire based on a complete theoretical model and by verifying its factor structure. They found that it was impossible to measure the *gunas* across different levels of human experience (like cognition, volition, social behavior, etc.) in one single scale composed of three factors. The differences and similarities of items of different behavioral categories seemed stronger than the differences and similarities of the three *guna* categories, thus distorting the factor structure. So, they developed nine separate scales for items grouped according to different aspects of behavior and experience (cognition, style of working, emotions, motives, activity level, volition, spiritual orientation, social behavior, and health). The three *guna* factors could be found in all nine scales.

Guna questionnaires could prove especially useful in examining the effects of meditation and other yoga practices, because the *gunas* play a dominant role in the theoretical basis for the *Yoga Sutras*. These, in turn, are an important basis of all Hindu approaches to meditation and can be meaningfully connected to Buddhism (see Sedlmeier and Srinivas 2015; Whiteman 1993).

Mindfulness questionnaires

The concept of mindfulness has attracted much attention recently and is sometimes even used as a synonym for meditation. Interest in the topic has also produced a number of mindfulness questionnaires. However, one problem in constructing mindfulness questionnaires is lack of consensus about the concept (Eberth et al. 2015b), and there might be the additional problem that people with and without mindfulness training might understand test items differently (Belzer et al. 2013).

The "original" meaning of mindfulness, as found in the Theravada insight meditation (*vipassana*) literature, is a kind of "awareness behavior": The mind simply observes the "four foundations of mindfulness"—the body and its processes, the feeling tone (positive, negative, and neutral), the mind itself, and the "*Dhammas*," which can be roughly translated as "objects of mind" (see Anālayo 2003 for a comprehensive treatment). The "original" hypothesis is that the cultivation of mindfulness, understood in this way, leads to the experience of intuitive wisdom (*prajna*). However, mindfulness in the "mindfulness literature" can mean many things: Apart from its original (Buddhist) usage, the term is used to denote an intervention, a (transient) state, and, most often, a (relatively stable) trait (Davidson 2010).

Most questionnaires measure trait mindfulness (for an overview see Sauer et al. 2013). The factor structures of these questionnaires differ widely, ranging from one factor (e.g., Brown and Ryan 2003) to up to five factors. For instance,

the FFMQ, developed by Baer et al. (2006) assumes the following five factors: (1) non-reactivity to inner experience; (2) observing/noticing/attending to sensations/perceptions/thoughts/feelings; (3) acting with awareness/automatic pilot/concentration/non-distraction; (4) describing/labeling with words; and (5) non-judging of experience. The most important difference between the existing mindfulness questionnaires seems to be whether they focus on only present-moment attention or, in addition, include some emotional components, such as acceptance of what is happening in the present moment (Sauer et al. 2013). Unfortunately, there is not yet consensus on what mindfulness means (Chiesa and Malinowski 2011; Dunne 2011; Grossman 2008). Therefore, it may be fruitful to either disentangle different definitions and specify what exactly is meant by mindfulness in order to eventually arrive at a consensus, or to develop different terms for different elements of mindfulness. The basis for a specific definition should be a precise theory of meditation. Only then can the operationalization of the respective concepts of mindfulness into a questionnaire with non-ambiguous items be expected to yield valid results.

Buddhist "temperaments"

One of the central tenets in Buddhism is that there is no enduring self, which also means that the Western conception of self as a part of one's personality that persists over time and situations (e.g., Feist and Feist 2009; Phares and Chaplin 1997) is not fully consistent with the Buddhist view. However, even the Buddha occasionally used the common ways of describing personality for pragmatic purposes and his discourses about a "personality theory" were elaborated in a famous ancient commentary called *Visuddhimagga*, or "Path of Purification" (Buddhagosa 2010; see also Kornfield 2009 for a recent rendering). This personality theory was used to find the most suitable kind of meditation practice for a given individual. The theory describes six types of personalities, consisting of three pairs—a negative temperament is always paired with respective positive tendencies. The *greed/faith* type is characterized by craving and optimism, the *aversive/discerning* type by criticism and clarity, and the *deluded/speculative* type by doubt and equanimity (see also Ekman et al. 2005; Schmidt 2009).

Correct practice of meditation is expected to change the "personalities" more into the respective positive dimension. For instance, greedy types should contemplate old age, sickness, and death to recognize the inherent transience of all objects and experiences; to develop faith and optimism, aversive types should learn to relax or notice joy (and not only suffering) to redirect their critical abilities into analytical ones; and deluded types should increase their awareness by labeling experiences and practicing single-pointed concentration, such as simple breath meditation. This theory of personality could be used to predict

people's success in practicing a given kind of meditation or to give advice to those who are interested in taking up a meditation practice but do not know which one to choose.

Custom-tailored measurement

Nothing speaks against using conventional methods in meditation research, such as the questionnaires described in the last section, as long as this is possible and makes sense. A huge advantage of such methods consists in their easy use and interpretation. However, some central questions in meditation research are hard to tackle with conventional quantitative methodological approaches, for reasons of both content and applicability. For instance, Indian theoretical approaches to meditation predict changes in cognition (e.g., the experience of "pure consciousness" or of "emptiness") that are not (yet) part of Western theorizing (Sedlmeier 2014; Sedlmeier and Srinivas 2015). Thus, there would be no existing theoretical basis for constructing a questionnaire and, in addition, it might not make much sense even if there was such a theoretical basis: How would one go about measuring "liberation," "enlightenment," or access to "pure consciousness" with a questionnaire? As long as there is no comprehensive theory of what happens when one meditates in the short and long term, a questionnaire would inevitably miss potentially important issues and it would limit the kinds of answers that could be given by meditators. Therefore, there seems to be no way to make progress in meditation research other than to ask meditators in a suitable way; that is, to apply qualitative methods.

Partly due to Nisbett and Wilson's (1977) highly influential paper on the inaccuracy of verbal reports in studies that examined social judgment tasks, there is still widespread doubt in the scientific community about whether introspection is a reliable source of knowledge. A later review of the evidence (White 1988) showed that Nisbett and Wilson's analysis was methodologically flawed and came to a much more positive conclusion about the accessibility of memory contents. Both analyses were concerned with inexperienced "introspectionists," whereas meditators can be expected to be highly sensitive and accurate about their experiences (Fox et al. 2012). But still, even with experienced introspectionists, there are two potential problems with traditional introspectionist practice. The first problem concerns the disentangling of experiences (the desired outcome) and interpretations (not desirable at this stage); even experienced meditators might occasionally have problems with this. Using a second person, trained to detect meditators' switches to interpretations and able to lead them back to their experiences, would be the solution (for respective techniques, see Petitmengin 2006; Petitmengin-Peugeot 1999). Whereas this first problem can be considered a technical one, the second concerns the contents of

meditators' accounts. These contents might only be understandable by a knowledgeable second person, that is, a researcher who is also a meditator or at least has a basic knowledge of theories of meditation. The "second person" of such an approach (Varela and Shear 1999) would also be more able to guide meditators' introspections so they would not miss important aspects of their experience (see also the section on "Meditators as expert collaborators").

How can we proceed?

There will, of course, still be many research questions that can be dealt with by using conventional methods of measurement, especially in evaluation studies that address changes in beginning meditators (e.g., the effectiveness of mindfulness programs in schools or work organizations). Such studies can benefit from developing theory-guided conventional instruments such as the *guna* or mindfulness questionnaires discussed earlier. Theories of meditation make and will go on making predictions about processes and changes over time, so it would be advantageous both for theory development and testing to increasingly use longitudinal (e.g., daily or weekly) measurement. Last but not least, qualitative methods will often be the only way to test theories in meditation research because of the lack of (and difficulty of constructing) suitable conventional methods of measurement. This holds especially if the researchers' aim is to find out more about special effects to be expected with experienced practitioners of a specific kind of meditation, or if theories of consciousness are to be tested.

Toward better research designs

Meditation research has usually relied on cross-sectional group comparisons (meditators vs. non-meditators) with either pre/post measurements (often with randomized control groups) or single measurements (with matched control groups). This is a feasible approach for relatively simple research questions (e.g., "Is the meditation group better/superior than the control group in variable X?"). However, group comparisons involving experienced meditators as participants can be expected to often suffer from high heterogeneity because these participants differ in many ways and it might then be difficult to find a control group that matches the experimental group in all important respects. In other words: Control of "nuisance variables," that is variables other than meditation that might also have an impact on the outcome, is hard to achieve. The ensuing variation in results that can be expected in such cases makes it difficult to detect even pronounced effects. Moreover, there might not be so many experienced meditators who are available for examining a specific research question, thus yielding low sample sizes with low chances of finding an effect. Connected to the first two points, a third drawback

with the usual group comparisons is that a single cross-sectional measurement (or even two such measurements) cannot really capture more detailed and specific changes over time that might be postulated by more precise theories of meditation. And fourth, more specific, custom-tailored measurements, as postulated earlier, considering meditators' personalities and experiences, are hard to make in a group setting. Therefore, we suggest that designs in meditation research at least in part move toward the individual and to repeated measurements. Two ways seem especially appropriate: Single-case experimental designs and designs that make the role of researcher and meditator in principle exchangeable.

Single-case experimental designs

The central aim of science is causal explanation. In meditation research, we want, for instance, to find out about causal relationships such as "If I meditate, my worries diminish," or "If I practice mindfulness meditation, my mindfulness will grow." The basic procedure for arriving at causal explanations in science is to perform "true" experiments, in which one or more independent variables are manipulated (e.g., meditation training: Yes or no) and all other potential causal factors (such as gender, age, education, motivation, etc.) are controlled for. In true experiments this control is achieved by dividing participants randomly between the experimental group(s) (e.g., meditators) and a control group (e.g., non-meditators). This randomization procedure guarantees that all variables that also might have an impact on the dependent variable(s) on average have the same or similar effects in both the experimental and the control group and so cannot systematically influence the difference in outcomes for the two groups. If, then, a difference between groups (e.g., meditators and non-meditators) is found, it can be concluded with high confidence (the height of this confidence depends on how well all parts of the study were operationalized) that it must be due to the manipulation of the independent variable (e.g., some people meditated and others did not). Randomization works well with large samples, less well with small samples, and not at all well with individuals.

The difference between any single-case design and single-case *experimental* designs consists in some kind of randomization that is a central ingredient in the latter (for a good introduction and overview see Barlow et al. 2009). This randomization obviously cannot be done over people. Instead it is done over time for a given person. The basic idea in single-case experimental designs is that the treatment(s) or intervention(s) are administered at randomly chosen points or intervals in time and then compared to baseline intervals or intervals of other treatments. Similar to randomization over people in group designs, randomization over time in single-case experimental designs controls for causal influences other than the independent variable(s) in question.

Probably the best known kinds of single-case designs are A–B–A designs or variations thereof (e.g., A–B–A–B, etc.) that begin with a baseline (A), introduce a treatment (B), and then withdraw the treatment again (A). Such designs are appropriate for examining whether a treatment is effective in principle but they target treatments that are not assumed to have lasting effects, as would be expected for meditation practice. However, a variation of this kind of design might be of some value in meditation research and will be briefly discussed later. More appropriate for examining the effects of meditation are *multiple-baseline designs* and, for special kinds of research questions, *alternating-treatment designs*.

Multiple-baseline designs

If meditation has an effect on some variable, one cannot expect this effect to vanish more or less completely once practitioners temporarily quit their meditation practice. Therefore, the usual A–B–A designs would not be a good choice. However, if meditation works in a specific way, one should see the effect in question irrespective of *when* meditators begin their practice. So, if it would be possible to demonstrate that there is a strong contingency between practicing a given meditation technique and a certain effect, irrespective of when the practice starts, this would be a strong argument for the causal role of this meditation practice. If meditators are randomly assigned a starting point in time, factors that change over time are controlled for, and if there is then a systematic pattern in the dependent variable that is similar for all participants, the results can be generalized if the selection of participants is representative.

Figure 13.1 illustrates the outcome of a hypothetical study on the effects of meditation in a multiple-baseline design with three male and three female participants who began their meditation at randomly chosen points in time, after two, three, or four weeks of baseline measurement. The hypothetical results in Figure 13.1 show a clear picture. After the onset of meditation practice, there is a pronounced effect; this, however, decreases again for the male but not the female participants.

Multiple-baseline designs of this type have been used in studies that looked at the effects of some specific meditation techniques. For instance, Singh et al. (2011a) examined the effects of a mindfulness-based procedure they called "Meditation on the Soles of the Feet" to control physical aggression of children with Asperger syndrome; and Singh et al. (2011b) studied the impact of a combination of this procedure and another one they called "Mindful Observation of Thoughts" on the behavior of adult sexual offenders with intellectual disability. In both studies, results indicated that the meditation procedures were effective.
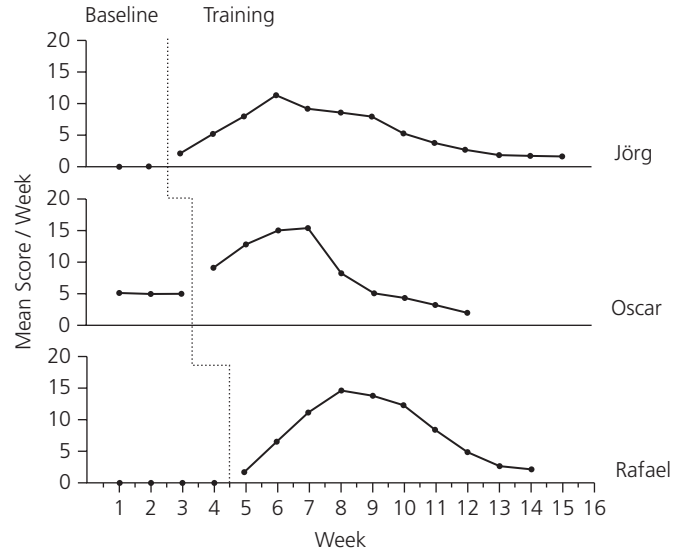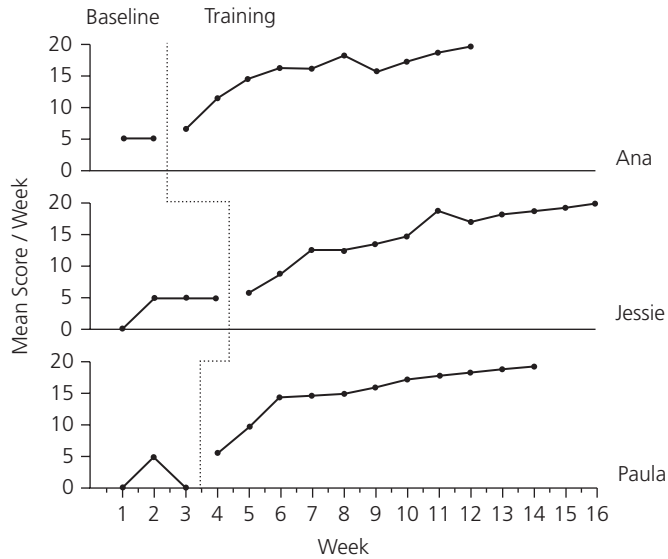
Fig. 13.1 Illustration of a multiple-baseline design.

Usually, when examining meditators, the length of the baseline measurements will be varied across different participants. But sometimes, it might also make sense to examine multiple baselines for different interventions for the same meditator. For instance, one might be interested in examining the effects of combining two meditation techniques and in the order effect in so doing. So, each meditator would, at a randomly chosen point in time, begin with one technique (e.g., some kind of focused meditation) and later, at another randomly chosen point in time, add a second technique (e.g., some kind of open awareness practice), with order of techniques again chosen randomly over meditators. If systematic patterns emerge for meditators in a given condition, irrespective of the random timing, this could be regarded as good evidence for some causal (and potentially differential) effects of the respective techniques and combinations thereof. But also apparently unsystematic results could be very informative, if differences in patterns could be related to the specifics (e.g., personality, social context, health condition, demographic variables, etc.) of different meditators.

If more than a few meditators take part in a study that uses a multiple-baseline design, nothing speaks against the usual group comparisons. Actually, a conventional waiting-group design could also be set up as a dual-baseline design with, say, a baseline of one week for the members of one group and a baseline of five weeks for the members of the other group (with random assignment to groups). The group comparison could, for instance, take place just before the second group begins their practice. In addition to a group comparison, one would have several kinds of additional information. One would know about the variation of effects over time, both within and across all participants, and one would have information about any systematic influences over time other than the effects of meditation (by analyzing the baseline data of the second group).

Alternating-treatment designs

If the main aim of a study was to discover if techniques differ in their effects (e.g., their effectiveness) concerning changes in some dependent variable, another single-case experimental design might be more appropriate: The *alternating-treatment design*. In this design, periods of different treatments are administered at randomly chosen intervals for each individual. Figure 13.2 gives a hypothetical example. Two meditation techniques (Treatment A and Treatment B) are administered for one week each in a randomly chosen order for a given participant. If the number of measurement points is not very large (such as the eight weeks depicted in Figure 13.2), one might want to restrict the random process by, for instance, not allowing more than two weeks in succession for a given meditation technique.
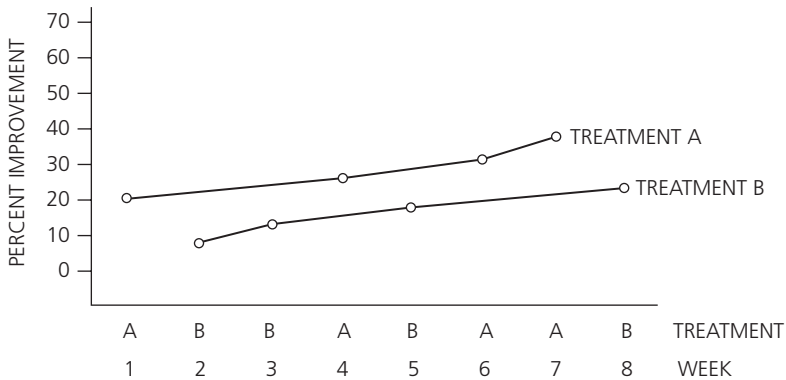
Fig. 13.2 Illustration of an alternating-treatment design.

A great advantage of alternating-treatment designs is that they automatically control for potential causal effects other than the independent variable (e.g., meditation technique A versus meditation technique B, or meditation versus no meditation). For instance, Figure 13.2 shows a general upward trend that is common for both Treatment A and Treatment B. This trend might be due to some mechanism shared by the two treatments or to other unknown processes. The important point is that such common or additional causal factors are automatically controlled for in alternating-treatment designs. The effect in question is the difference between the two (or more) treatments. And this effect will always be seen by looking at the difference in the lines that connect the measurements for the different types of treatments. In Figure 13.2, the two lines are more or less parallel, indicating a general superiority of Treatment A, but another angle of the lines might lead to other conclusions that could be seen immediately (e.g., initial difference but eventual convergence of effects).

Other designs

Even the classic A–B–A design (and extensions thereof, such as A–B–A–B, etc.) might be useful in meditation research if one is interested in the stability of meditation effects. What happens if, after having practiced a meditation technique for a month or any other randomly chosen time interval, people cease to meditate? What happens when they begin again? One might also be interested in a dose effect. What happens if meditators change the amount of time they spend on their daily meditation? Would, for instance, a meditation retreat with continually increasing meditation times per day (e.g., A–B_{2h}–B_{3h}–B_{4h}–B_{5h}–B_{6h}–A) be more effective than one with an identical overall time but constant daily meditation times (e.g., A–B_{4h}–B_{4h}–B_{4h}–B_{4h}–B_{4h}–A)?

In sum, single-case experimental designs are a promising alternative to conventional group designs. But far from being only a substitute for group designs, single-case experimental designs offer much higher flexibility and allow the examination of hypotheses and questions (especially about changes over time) that are not feasible in group designs.

Meditators as expert collaborators

In the section on custom-tailored measurement, we argued that meditation research would profit from a "second-person" approach, in which a researcher who is both knowledgeable in qualitative methods and in meditation research collaborates with an experienced meditator. Such a collaborative research effort can of course be done in many ways and using many kinds of designs, including single-case experimental designs as described in the earlier section. Especially for examining cognitive processes of very advanced meditators, the most promising design might, however, be a *researcher–meditator dyad* that is based on true equality (and possibly interchangeability) in the roles of researchers and meditators.

Such a collaboration between experienced meditators and researchers (who are also meditators) might be the only way to explore very specific questions, especially those that deal with the ultimate aim of meditation according to the original Indian approaches, termed enlightenment, liberation, nirvana, or moksa, among other names. But irrespective of the research question pursued, the collaborative endeavor would have several advantages compared to the traditional researcher–participant set-up. First, research on advanced topics of meditation needs a trusting relationship between researcher and meditator, which might be fostered by shared experiential background. Second, such a common background would enable the researcher to understand the collaborator's utterances more easily than experimenters with no respective experiences. And third, as meditation practice is usually expected to go along with an increasingly less biased perception of one's inner processes, "measurements" can also be expected to be more precise on the meditator's side and to be interpreted with less bias by the researcher. In the ideal case, meditation research would be conducted by experienced meditators and experienced researchers who could interchange their roles at any time.

However, this kind of research, of course, also faces challenges such as collusions between researchers and meditators, or shared delusions. It can only be expected to work if researchers' and meditators' experiences and findings are made available in an unfiltered way and are replicated by independent dyads. These potential problems notwithstanding, it seems that there is no other way to get a satisfactory and systematic access to the experiences of highly advanced meditators.

How can we proceed?

While conventional research designs still have their merits, meditation research would profit from designs that take into account the meditators' personality characteristics and specific experiences, and the peculiarities of the respective meditation techniques they practice. This can be better done in single-case designs, and single-case *experimental* designs seem to be most appropriate because they allow for causal conclusions due to the random selection of time intervals, which distinguishes these kinds of designs from "normal" single-case designs. In general, it seems beneficial, if not necessary, at least in some cases, that researchers also have some meditation practice themselves, especially if long-term effects are the topic of research. A good way to start single-case research in this way might be to consider having a closer look at selected individuals, even when attempting to do conventional group research.

Conclusion

Although the effects of meditation have been examined now for several decades, it seems that systematic meditation research is still at the stage psychotherapy research was at about 40 years ago, when predictions about, as well as evaluations of, different forms of psychotherapy were rather undifferentiated (see Barlow 2010). The most urgent current task in meditation research is to make existing theories more precise and comprehensive. In this chapter we have made suggestions about how researchers might arrive at better theories. Better theories will lead to better and more specific methods of measurement being done in research designs that are more appropriate for meditation research than the ubiquitous group designs.

In this chapter we have mainly dealt with meditation research as if it was a monolithic endeavor. In fact, there are at least three strands of meditation research. The oldest deals with therapeutic aspects of meditation (e.g., Wallace and Shapiro 2006; Walsh and Shapiro 2006). A second strand deals with the psychophysical effects of meditation and is currently receiving much attention. The third strand deals with psychological effects for non-clinical practitioners. This is the approach that is closest to the original use of meditation as part of a path (yoga) to liberation from the limitations of life (Feuerstein 2001). The arguments for improving theories, measurements, and designs in meditation research advanced in this chapter are equally relevant for all three strands, and it is certainly worthwhile to put our collected efforts into that improvement.

Personal Meditation Journey

Peter Sedlmeier

I was already drawn to meditation and yoga in my youth and tried several techniques I learned from books. Eventually I received an introduction to Transcendental Meditation, which I then practiced for about a year. This period of my life culminated in a half-year journey to India and Nepal, where I had some personal encounters with yoga teachers and people practicing Aurobindo's Integral Yoga. Then, after having begun to study psychology, I abandoned meditation and yoga. Only about 13 years ago, shortly after I got my professorship, I noticed that something was missing in my life and I resumed my meditation practice: This time Zen meditation (a mixture of Rinzai and Soto), under the guidance of an Indian Zen master. This is what feels good for me and what I have been continually practicing since then, notwithstanding an excursion into the Theravada world (a month-long retreat in a Thai monastery in the tradition of Mahasi Sayadaw). My daily practice consists of a short yoga routine and one daily sitting, interspersed with regular periods of more intense meditation practice, including week-long silent retreats (Sesshins) in Germany and India.

In the winter of 2004, during a sabbatical in India, I began to combine my practice with an interest in the theoretical foundations of meditation and first met with Indian philosophers at Pondicherry University and members of a loose nationwide Indian organization consisting of psychologists, philosophers, linguists, and others who propagate Indian psychology in the sense of "psychology that goes back to the Vedas." Since then, together with my Indian colleagues, I have tried to find out what the psychological theories contained in ancient Indian texts have to contribute to a theory of meditation. This sabbatical was also the starting point for including issues of meditation in the areas I am exploring in my research, and since then I have also supervised students who are interested in working on topics that have to do with meditation.

Meanwhile, especially after completing a meta-analysis on the psychological effects of meditation, but also by watching myself and companion meditators, I have become convinced that meditation works. However, it seems that the more I learn about meditation, the more new questions come up. I find it especially interesting and important to also have a systematic look at advanced effects of meditation as postulated by basically all Indian theoretical approaches. This is not an easy enterprise. My Indian colleagues tend to argue that science does not provide the right means to look at meditation and spirituality, while many of my Western colleagues think that the topic is not worthy of scientific examination because the Indian theoretical background, especially, is esoteric, cannot be disentangled from religion, and is full of unfounded beliefs—in one word: Unscientific. I don't agree with either opinion but I think that such views can only be

overcome if meditation research is done open-mindedly and if we are willing to use all available resources that the scientific method can supply. The value of meditation should not be a matter of belief and ideology but of empirical evidence.

Personal Meditation Journey

Juliane Eberth

When I was 14, in school we talked about the principles of Buddhism. I became interested in Buddhism and increasingly incorporated Buddhist ideas into my way of thinking. Later, I began studying psychology and was very interested in happiness research. When studying the literature on happiness and well-being, I came across many ideas that concurred with Buddhist thought. I began reading books by Buddhist monks. They strongly recommended trying meditation instead of engaging only cognitively in Buddhist thought. Lacking a meditation center or teacher in the vicinity, I attended a mindfulness-based stress reduction program where people are taught various meditation practices (observing breath, mindfulness meditation, loving kindness meditation, and others). Afterward, I kept on meditating, sometimes with a newly founded meditation group.

While doing research on the effects of meditation, I stopped practicing. I was increasingly satisfied with the cognitive engagement. Nevertheless, with informal practice, I've been trying to be constantly aware of the impermanence of everything and to behave accordingly. During my pregnancy, I attended a hatha yoga program and re-established my meditation practice. Still, the Buddhist ideas continue to stir my interest. I deem it essential to my life to endeavor to keep the Buddhist mindset every single day; for me, formal practice is important for achieving this goal.

Personal Meditation Journey

Maika Puta

I meditated for the first time in 2003 while visiting a program at a bhakti yoga center. I was accompanying a friend and didn't really know what to expect. Part of the program included a mantra meditation on the Hare Krishna mantra, in the form of singing the mantra together. The mantra and music touched me, but I also remember wondering how the others managed to be so absorbed in the meditation for a whole hour without getting bored or distracted. I don't know what I would have thought if I had known that

this is actually one of the easiest kinds of meditation due to the support of the music and congregation. I was intrigued by the thought of shaping my inner life with regular practice and first started experimenting with meditation by singing the mantra randomly during the day. In the following months my interest in bhakti yoga bloomed and at some point I reserved a place for focused silent mantra meditation in my daily life—a place that remains.

In the bhakti yoga philosophy, mantras are compared to touchstones. Reflecting on the effects mantra meditation has had on my life, I cannot think of a more fitting comparison. Meditation has been a touchstone for my mind and heart. Most importantly it has introduced me to unprecedented and profound peace of mind, happiness, and love. Over the years the practice has finely woven itself into the fabric of my life. On the one hand, it directly strengthens and influences me and on the other hand I have molded my life so that it supports the meditation. I have found that the depth of my meditation is not an isolated experience, but that it reflects my life and firmly rests on the way I act and, most importantly, think outside of the practice. In this way, meditation has grown from an experiment to a practice and way of life. Meditation—during and outside of the practice itself—continues to be my greatest adventure and I look forward to the experiences that await me.

Acknowledgment

References

Amihai, I. and Kozhevnikov, M. (2014). Arousal vs. relaxation: A comparison of the neurophysiological and cognitive correlates of Vajrayana and Theravada meditative practices. *PLoS ONE* **9**(7), e102990.

Anālayo (2003). *Satipaṭṭhāna: The direct path to realization*. Chiang Mai, Thailand: Silkworm Books.

Archana Das, G. M. and Venu Gopal, D. V. (2009). Trigunas and psychological problems. *Journal of Indian Psychology*, **27**, 47–52.

Baer, R. A. (2009). Self-focused attention and mechanisms of change in mindfulness-based treatment. *Cognitive Behavior Therapy*, **38**, 15–20.

Baer, R. A., Smith, G. T., Hopkins, J. et al. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, **13**, 27–45.

Barlow, D. H. (2010). Negative effects from psychological treatments: A perspective. *American Psychologist*, **65**, 13–20.

Barlow, D. H., Nock, M. K., and Hersen, M. (2009). *Single case experimental designs: Strategies for studying behavior change*, 3rd edition. Boston, MA: Pearson.

Belzer, F., Schmidt, S., Lucius-Hoene, G. et al. (2013). Challenging the construct validity of mindfulness assessment—A cognitive interview study of the Freiburg Mindfulness Inventory. *Mindfulness*, **4**, 33–44.

Benson, H., Beary, J. F., and Carol, M. P. (1974). The relaxation response. *Psychiatry*, **37**, 37–46.

Bhal, K. T. and Debnath, N. (2006). Conceptualizing and measuring gunas: Predictors of workplace ethics of Indian professionals. *International Journal of Cross Cultural Management*, **6**, 169–188.

Brown, K. W. and Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, **84**, 822–848.

Brown, K., Ryan, R. M., and Creswell, J. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, **18**, 211–237.

Buddhagosa, B. (2010). *The path of purification (Visuddhimagga)*. (B. Ñáóamoli, trans. from the Pali language). Kandy, Sri Lanka: Buddhist Publication Society.

Cahn, B. R. and Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin*, **132**, 180–211.

Chiesa, A. and Malinowski, P. (2011). Mindfulness-based approaches: Are they all the same? *Journal of Clinical Psychology*, **67**, 404–424.

Clausen, S. S., Crawford, C. C., and Ives, J. A. (2014). Does neuroimaging provide evidence of meditation-mediated neuroplasticity? In S. Schmidt and H. Walach (Eds.). *Meditation: Neuroscientific approaches and philosophical implications*, pp. 115–135. Berlin, Germany: Springer.

Coffey, K. A., Hartman, M., and Fredrickson, B. L. (2010). Deconstructing mindfulness and constructing mental health: Understanding mindfulness and its mechanisms of action. *Mindfulness*, **1**, 235–253.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, 2nd edition. Hillsdale, NJ: Lawrence Erlbaum Associates.

Cornelissen, M. (2011). *Research about yoga and research in yoga: Towards rigorous research in the subjective domain*. [Online] Available at: http://ipi.org.in/texts/matthijs/mc-researchinyoga.php.

Daftuar, C. N. and Anjuli (1997). Occupational stress, organizational commitment and job involvement in sattva, rajas and tamas personality types. *Journal of Indian Psychology*, **15**, 44–52.

Dasgupta, S. (1930). *Yoga philosophy in relation to other systems of Indian thought*. Calcutta, India: University of Calcutta.

Davidson, R. J. (2010). Empirical explorations of mindfulness: Conceptual and methodological conundrums. *Emotion*, **10**, 8–11.

Dunne, J. (2011). Toward an understanding of non-dual mindfulness. *Contemporary Buddhism: An Interdisciplinary Journal*, **12**, 71–88.

Eberth, J. and Sedlmeier, P. (2012). The effects of mindfulness meditation: A meta-analysis. *Mindfulness*, **3**, 174–189.

Eberth, J., Sedlmeier, P., and Lazarides, C. (2015a). *Calm down and gain insight: A theoretical basis of meditation effects*. Manuscript submitted for publication.

Eberth, J., Sedlmeier, P., and Schäfer, T. (2015b). *The fundamental dimensions of mindfulness: Scale development, psychometric properties, and first results*. Manuscript submitted for publication.

Ekman, P., Davidson, R. J., Ricard, M., and Wallace, B. A. (2005). Buddhist and psychological perspectives on emotions and well-being. *Current Directions in Psychological Science*, **14**, 59–63.

Feist, J. and Feist, G. J. (2009). *Theories of personality*, 7th edition. Boston, MA: McGraw Hill Higher Education.

Feuerstein, G. (2001). *The yoga tradition: Its history, literature, philosophy and practice*. Prescott, AZ: Hohm Press.

Fox, K. C. R., Nijeboer, S., Dixon, M. L. et al. (2014). Is meditation associated with altered brain structure? A systematic review and meta-analysis of morphometric neuroimaging in meditation practitioners. *Neuroscience and Biobehavioral Reviews*, **43**, 48–73. doi:10.1016/j.neubiorev.2014.03.016

Fox, K. C. R., Zakarauskas, P., Dixon, M. et al. (2012). Meditation experience predicts introspective accuracy. *PLoS ONE 7*(9), e45370. doi:10.1371/journal.pone.0045370

Garland, E., Gaylord, S., and Park, J. (2009). The role of mindfulness in positive reappraisal. *Explore (NY)*, **5**, 37–44.

Goyal, M., Singh, S., Sibinga, E. S. et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, **174**(3), 357–368. doi:10.1001/jamainternmed.2013.13018.

Grabovac, A. D., Lau, M. A., and Willett, B. R. (2011). Mechanisms of mindfulness: A Buddhist psychological model. *Mindfulness*, **2**, 154–166.

Grossman, P. (2008). On measuring mindfulness in psychosomatic and psychological research. *Journal of Psychosomatic Research*, **64**, 405–408.

Hölzel, B. K., Lazar, S. W., Gard, T. et al. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science*, **6**, 537–559.

Hopkins, J. A. (2003). *The congruence of personality psychology and religion: Investigating Eastern typologies*. University of Colorado at Boulder. Unpublished manuscript.

Jha, A. K. (2008). Personality in Indian psychology. In K. R. Rao, A. C. Paranjpe, and A. K. Dalal (Eds.). *Handbook of Indian psychology*, pp.348–360. Delhi, India: Cambridge University Press.

Kaur, P. and Sinha, A. K. (1992). Dimensions of guna in organizational setting. *Vikalpa*, **17**(3), 27–32.

Kornfield, J. (2009). *The wise heart: A guide to the universal teachings of Buddhist psychology*. New York, NY: Bantam Books.

Lumma, A. L., Kok, B. E., and Singer, T. (2015). Is meditation always relaxing? Investigating heart rate, heart rate variability, experienced effort and likeability during training of three types of meditation. *International Journal of Psychophysiology*, **97**, 38–45.

Lutz, A., Dunne, J. D., and Davidson, R. J. (2007). Meditation and the neuroscience of consciousness: An introduction. In P. Zelazo, M. Moscovitch, and E. Thompson (Eds.). *Cambridge handbook of consciousness*, pp.497–549. Cambridge, England: Cambridge University Press.

Lutz, A., Slagter, H. A., Dunne, J. D., and Davidson, R. J. (2008). Attention regulation and monitoring in meditation. *Trends in Cognitive Sciences*, **12**, 163–169.

Nisbett, R. E. and Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, **84**, 231–259.

Olendzki, A. (2010). *Unlimiting mind: The radically experiential psychology of Buddhism*. Somerville, MA: Wisdom Publications.

Ospina, M. B., Bond, K., Karkhaneh, M. et al. (2007). *Meditation practices for health: State of the research*. Edmonton, Alberta, Canada: University of Alberta Evidence-Based Practice Center.

Petitmengin, C. (2006). Describing one's subjective experience in the second person: An interview method for the science of consciousness. *Phenomenology and the Cognitive Sciences*, **5**, 229–269.

Petitmengin, C., Remillieux, A., Cahour, B., and Carter-Thomas, S. (2013). A gap in Nisbett and Wilson's findings? A first-person access to our cognitive processes. *Consciousness and Cognition*, **22**, 654–669.

Petitmengin-Peugeot, C. (1999). The intuitive experience. *Journal of Consciousness Studies*, **6**, 43–77.

Phares, E. J. and Chaplin, W. F. (1997). *Introduction to personality*, 4th edition. New York, NY: Longman.

Puta, M. and Sedlmeier, P. (2014). The concept of tri-guna: A working model. In S.Schmidt and H. Walach (Eds.). *Meditation: Neuroscientific approaches and philosophical implications*, pp. 317–364. Berlin, Germany: Springer.

Puta, M. and Sedlmeier, P. (2015). *Skalen zur Erfassung der Tri-Gunas (STG): Entwicklung und psychometrische Eigenschaften [Scales to measure the tri-gunas (STG): Development and psychometric properties]*. Chemnitz University of Technology. Unpublished manuscript.

Sauer, S., Walach, H., Schmidt, S. et al. (2013). Assessment of mindfulness: Review on state of the art. *Mindfulness*, **4**, 3–17.

Schmidt, A. (2009). Which personality type are you? *Tricycle*, spring, 74–79.

Sedlmeier, P. (2006). Ancient Indian psychology: Can it offer anything to academic psychology? In R. Rapp, P. Sedlmeier, and G. Zunker-Rapp (Eds.). *Perspectives on cognition: A Festschrift in honor of Manfred Wettler*, pp. 199–214. Lengerich, Germany: Pabst.

Sedlmeier, P. (2014). Indian psychology and the scientific method. In R. M. M. Cornelissen, G. Misra, and S. Varma (Eds.). *Foundations and applications of Indian psychology*, pp. 53–79. Delhi, India: Pearson.

Sedlmeier, P., Eberth, J., and Schwarz, M. (2014). Meta-analyses and other methodological issues in meditation research: Reply to Orme-Johnson and Dillbeck (2014). *Psychological Bulletin*, **140**, 617–622.

Sedlmeier, P., Eberth, J., Schwarz, M. et al. (2012). The psychological effects of meditation: A meta-analysis. *Psychological Bulletin*, **138**, 1139–1171.

Sedlmeier, P. and Srinivas, K. (2015). Theories of consciousness and cognition in ancient Indian thought systems. Chemnitz University of Technology. Manuscript submitted for publication.

Shapiro, S. L., Carlson, L. E., Astin, J. A., and Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, **62**, 373–386.

Shilpa, S. and Murthy, C. G. V. (2012). Development and standardization of Mysore Triguna Scale. *SAGE Open*, [Online] Available at: http://sgo.sagepub.com/content/2/1/2158244012436564 [Accessed July 28, 2012].

Singh, N. N., Lancioni, G. E., Singh, A. D. A. et al. (2011a). Adolescents with Asperger syndrome can use a mindfulness-based strategy to control their aggressive behaviour. *Research in Autism Spectrum Disorders*, **5**, 1103–1109.

Singh, N. N., Lancioni, G. E., Winton, A. S. W. et al. (2011b). Can adult offenders with intellectual disabilities use mindfulness-based procedures to control their deviant sexual arousal? *Psychology, Crime and Law*, **17**, 165–179.

Sitamma, M. (2005). Trigunas: A review of empirical studies. In K. Ramakrishna Rao and S. B. Marwaha (Eds.). *Towards a spiritual psychology—Essays in Indian psychology*, pp. 262–276. New Delhi, India: Samvad India Foundation.

Stempel, H. S., Cheston, S. E., Greer, J. M., and Gillespie, C. K. (2006). Further exploration of the Vedic Personality Inventory: Validity, reliability and generalizability. *Psychological Reports*, **98**, 261–273.

Teasdale, J. D., Moore, R. G., Hayhurst, H. et al. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, **70**, 275–287.

Teper, R., Segal, Z. V., and Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science*, **22**, 449–454.

Vago, D. R. and Silbersweig, D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): A framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience*, **6**. doi:10.3389/fnhum.2012.00296

Varela, F. J. and Shear, J. (1999). First-person methodologies: What, why, how? *Journal of Consciousness Studies*, 6, 1–14.

Vermersch, P. (1999). Introspection as practice. *Journal of Consciousness Studies*, **6**, 17–42.

Wallace, B. A. (1999). The Buddhist tradition of *Samatha. Journal of Consciousness Studies*, 6, 175–187.

Wallace, B. A. and Shapiro, S. L. (2006). Mental balance and well-being: Building bridges between Buddhism and Western psychology. *American Psychologist*, **61**, 690–701.

Walsh, R. and Shapiro, S. L. (2006). The meeting of meditative disciplines and Western psychology: A mutually enriching dialogue. *American Psychologist*, **61**, 227–239.

White, P. A. (1988). Knowing more about what we can tell: "Introspective access" and causal report accuracy 10 years later. *British Journal of Psychology*, **79**, 13–45.

Whiteman, J. H. M. (1993). *Aphorisms on spiritual method: The "Yoga Sutras of Patanjali" in the light of mystical experience*. Gerrards Cross, England: Colin Smythe.

Wolf, D. B. (1998). The Vedic Personality Inventory: A study of the gunas. *Journal of Indian Psychology*, **16**, 26–43.

Chapter 14

How meditation changes lives: Practice, research, and personal journeys

Michael A. West

The start of the day. Getting up, showered and to the garden to sit on a cushion in the gazebo by the pond. Drifting from here and now presence into thoughts of the talk I gave in London earlier in the week. And back again. A bumble bee floating by. Thoughts about the meetings coming up today. And back to presence. Settling back each time into an open and contented orientation to nowness. Moments, periods of clear awareness. And thoughts about the way we humans manage our collective affairs—imprisonment for transgressors in most societies. The futility of so much in our political systems. And is the exploration of our consciousness via meditation a solution? And back again to awareness of the present moment. Presence. The peace and clarity and unbounded, quiet import of presence—being present. What is this practice?

Concentration and enquiry

A number of themes have appeared and reappeared across the chapters of this book. One powerful theme is the exploration of the processes or mechanisms of meditation. Martine Batchelor's chapter draws on her long experience as a practitioner and teacher of meditation in a variety of contexts (Korea, England, and France) and her profound understanding of Buddhist teachings. The chapter suggests that there are two core elements of meditation: Concentration and enquiry.

The necessary first component is concentration. During meditation, the practitioner narrows attention to a single focus such as the breath, a mantra, or to awareness of the present moment. Regardless of whether the meditation involves focused awareness or opening up to all in the present moment, the practice involves concentration (with more or less intensity) on one aspect of experience—such as the experience of here and now, the experience of the self, a candle flame, or the intent to cultivate compassion toward others. Meditation is a training of attention; the development of attentional discipline. How this is achieved can vary from a permissive, gentle coaxing of attention when it wanders through to a more deliberate and "muscular" determination to discipline the wayward mind.

The second element describes the exploration of experience, whether through sensation, awareness, or intellectual engagement with what arises both during and outside of meditation. By not only being aware of experience, but also engaging with it, we become more informed and curious about the consequences of the concentration processes of meditation. As negative thoughts arise or fantasies about our success bubble up in our minds, we can observe and explore them through a process of enquiry. Our curiosity enables us to interrogate our experience and derive a deeper appreciation if not understanding, but only if we accept rather than avoid, suppress, or seek out these thoughts and sensations. Martine Batchelor argues that the combination of enquiry with concentration ensures we are not simply increasing our awareness of the contents of consciousness but nurturing the conditions for a more creative awareness. Through meditation practice we develop a less filtered, stereotypic, and habitually categorical orientation to our experience, enabling us to taste the moments of our experience rather than responding with pre-scripted appreciation or with habituated neutrality. In this sense, she suggests, our awareness is more creative both during and as a result of meditation practice. The value of this enquiry element of meditation practice to our recognition of our conditioning is emphasized by other contributors throughout the book.

The "microgenesis" of experience

Guy Claxton (in Chapter 3) adopts an embodied cognition perspective to explore how the "microgenesis" of moment-to-moment experience is revealed through regular meditation practice. Using metaphors, he describes how we are generally unaware of the subtle processes by which cognitions and feelings manifest. Cognitions, for example, may unfurl from subtle cues in our environment, so subtle that we are unaware of them. Feelings too may "well up," building to a point where we become aware of them (e.g., as a lump in the throat during the narration of a tragic story). But through the process of repeatedly

paying attention (through concentration and enquiry) via meditation practice, over time we become gradually more aware of these subtle processes as they become conscious, rising to the surface like bubbles. With practice, we catch them earlier in their upward drift and understand more of their genesis. My vague feeling of discomfort is associated with the sound of a distant voice that seemed tinged with anger, which I had barely noticed. And, as a result, my current actions are somehow unfolding in a defensive and anxious way. Guy Claxton suggests that our crude binary distinction between what is conscious and unconscious is revealed by meditation practice to be masking what is in reality a gradual slope that we can explore. The practice of meditation changes our awareness by retraining our sensitivity so we break the hypnotic spell that allows us only to see the bubbles when they break noisily on the surface of the water.

Loosening the bonds of social conditioning

Another theme is the recognition of and, thereby, increasing freedom from social conditioning. Our experiences are shaped by society, by language, by the myriad consensus constructions of our social worlds. We are trapped in cages of perception shaped by our cultures and by the bombardment from social media, television, conversations, advertisements, indeed all the information intensity of modern society. Such stimulus intensity leaves us struggling to appreciate this moment; to engage with our moment-to-moment being in this vast, mysterious universe. Instead, our moments are dominated by transient and superficial concerns with status, power, money, and reputation. Our need to manage impressions has us anxiously checking and rechecking our appearance both physically and behaviorally to ensure we garner good will and respect, and avoid at all costs (including the cost of simply being) negative judgments of others. We spend much of our lives lost in thought, ruminating about the past and planning for the future. And the richness of the present moment passes us by; it is lost to us, except for rare moments when the clouds seem to part and we experience the blue sky of this moment.

Our construction of our lives is as passive recipients of scripts handed to us through socialization and social interaction; and we are so caught in the cage of these human constructions that we find it difficult to fly free in the infinite potential of the present moment. By catching our experience in the process of unfurling we become aware of these constructions and cages; little by little at first but with increasing stability as we practice meditation. And by slowing down the process of unfurling, we develop an increasingly powerful awareness of both the thought and emotional processes we are enslaved by and thereby develop the ability to loosen the bonds. We come to realize that we don't have to

live the scripts we have been handed. As Guy Claxton points out, by stabilizing attention though meditation practice we can hold it steadily at different points in the unfurling process and see what is going on. We become more aware of body and cognitive processes, more vigilant to the emerging sensations at earlier stages in their genesis, and we see the extent to which our moment-to-moment experiences are masked in the social constructions we are programmed by. We become aware of the matrix we are embedded in. Through meditation practice, we hear the sound of preconditioned bodily and cognitive processes earlier and earlier in their genesis, allowing us to exercise choice about the manner of their arrival as full-blown experiences. And crucially, we can connect more authentically and deeply with those around us.

The desire to find certainty or structure that frees us can also lead to the reproduction of our entanglements in the very liberating groups and movements we seek. There is the potential for us inadvertently to reconstruct the cages of our conditioning through membership of spiritual or philosophical movements that engage our impulsion to conformity—be they Buddhist, Hindu, Christian, mindfulness groups, TM, or whatever. I attended a retreat in the 1980s led by a revered Tibetan Buddhist lama, who happened to have a cold that he was sensibly treating by dousing his handkerchief in eucalyptus oil. Remarkably, many of those attending the retreat began using the remedy throughout the day, though few had colds. Joining groups that tell us what to think and perceive and how to behave, or that we seek to conform with, albeit in the name of liberation, can simply cloud our vision in new ways. Ironically, membership of the group may be a current pulling in a direction quite opposite to the process of increasing awareness of the unfurling process.

Tolerance of uncertainty

Much in human society is constructed to reduce uncertainty and insecurity (a consequence, as James Carmody argues, of our evolved attentional vigilance). Another theme in this book is that meditation practice can strengthen our tolerance of uncertainty, since we are less likely to passively categorize, label, or trap the birds of our experience in pre-defined cages. By becoming aware of the shenanigans of the mind and by seeing the undefined nature of experience more frequently in our meditation practice, we can accept uncertainty (and the associated insecurity of uncertainty) more comfortably (see the discussion of this by Watts 2011). By maintaining an attitude of openness and acceptance during meditation practice, uncertainty, ambiguity, and insecurity become more the comfortable norm than the threat-arousing exception. Perhaps we are then more able to be at peace with the broader uncertainty, ambiguity, and

insecurity of our existence as a consequence. And because of that greater peace, we can more readily embrace the reality of the present moment without it threatening to tip us into existential anxiety or terror.

James Carmody's evolutionary perspective highlights our evolved vigilance-related attending—vigilance to opportunity (food, mates, safe places to sleep) and more powerfully to threats (predators, hostile others, approaching storms). This vigilance creates an almost perpetual state of at least vague unease or dissatisfaction as we strive to avoid danger or increase opportunity. Much of our experience is consequently distorted—we cannot savor the food we are eating in this moment if we are anxious about future events or lost in ruminations about past hurts or shames. And so we seek solutions to our unease by looking through the lenses of vigilance for further opportunity or threat, when the problem is those very lenses.

Becoming less threatened and more vigilant

We add to this threat vigilance an internal monologue that overlays our experience ("I said the wrong thing"; "I wasn't sufficiently entertaining to be with"; "he put me down in front of others"), and our affective world is a boulder we must roll continually uphill. But meditation helps us to be aware of these default mental processes. As Carmody says, meditation will not eradicate this vigilance system but can enable us "to work with it more skillfully." By being more sympathetic and compassionate toward our experience, we can begin to exercise more choice; to be less passively susceptible to the threat vigilance processes that filter our moment-to-moment experience. We can let go of threat and just be more vigilant to our moment-to-moment experience. We can more skillfully appreciate the moment without necessarily being carried away by a current of anxiety, instead choosing to observe the inner monologue and noting it compassionately.

In the process, we find we have more choice about what and how we experience our moments by learning to *be* in a more spacious and choiceful way. Meditation practice is thus a process of learning to engage directly with the present moment in an open, more contented and accepting rather than threatened (or needful) way. We learn to be aware of sensations, thoughts, and feeling tones and develop the ability to observe, understand, and accept them in a less incendiary way than when they are simply unconscious processes that cause us pain. This can enable us to see our world, material objects, our feelings, our thoughts, other people, and our wider existence with freshness and curiosity. By interrupting stressful or painful thoughts through observing them compassionately, we can choose to have the more positive experience of being in the present moment.

Sense of self and presence

Exploration of the self is a theme across the contributors' chapters and is an abiding theme in all traditions that employ meditation practice, since it focuses us directly on the experience of self. Sitting in meditation is frequently accompanied by unfiltered encounters with our self. Here I am sitting in meditation; there is little other stimulation; there is the experience of a "me"; it is fleeting and sometimes unsettling; it shifts and changes; sometimes the self seems to evaporate altogether in the breadth of the present moment as thought dies away and awareness of nowness fills consciousness. And this undermines the illusion of a stable, constant self-concept—our experience of our self as a clear and constant presence behind moment-to-moment experience. Meditation is a means of investigating self, "I-ness," existence, and being. By paying attention repeatedly to the present moment and our subjective experience of it, we become infused with awareness of the present (we develop "presence") such that it is more and more the flavor of our moments. This living awareness of nowness then becomes a way of being, changing our experience of self—our practice (in the second sense of practice that Carmody describes as a calling). Our practice is no longer confined to a cushion but is deliberately strengthened with the consequent gradual changes in the hue of our moment-to-moment experience. Thus, our meditation practice is both an investigation into the experience of being (in the present moment) but also enables direct experience of I-ness via new and sustained awakenings.

What these practices produce over time, according to many practitioners and researchers, is greater peace, a sense of more profound meaning, more and deeper joy, and a sense of gratitude and privilege in life (see the discussion in Chapter 1 for references to this literature). Freed from the narratives of ruminative preoccupation, they suggest, we experience more immediately and directly the moments of our existence and have the available capacity to see the trees, to be with those we love, to appreciate the benevolence life has conferred on us, and to marvel at the fact of our universe, our planet, and the riches of loving relationships.

Developing compassion

Some meditation practices, such as compassion-focused meditation, are aimed at equipping us with the ability to cultivate new fields of thought. Rather than simply observing unfolding thought processes, we can cultivate new mind-body, thought-feeling fields of activity. I may wish to be a more compassionate person, paying attention to others (listening with fascination), having empathic responses, and taking intelligent action to help—the components of compassion

(Atkins and Parker 2012). By rehearsing compassion toward myself, toward my loved ones, toward those I have difficulty with, and all humankind, I begin to tread into existence new paths of thought and feeling that have neurophysiological reality too (Neff and Germer 2013; Salzberg 2011). The brain develops new ways of working as a result of these practices and the person becomes more compassionate (see Gilbert 2013 for an extensive treatment of this perspective).

Several contributors refer to the extent to which meditation may bring us closer to others. Guy Claxton talks about how, through meditation practice, altruism can emerge because self-protection and enhancement are no longer so powerful in separating us from others. The natural motivations we have to altruism and to building strong, close relationships, normally inhibited by self-protection and self-enhancement (the vigilance processes Carmody describes), are free to be expressed. The choice that stable attention to the unfurling of those processes provides the space for altruism and reaching out. The practice of loving kindness meditation (or compassion meditation) is intended to directly promote stronger connection and altruism in interactions with others.

Finding connection

A second kind of connection is sought by many meditators or it may emerge as a natural consequence of long-term practice. Many who practice meditation do so to achieve some spiritual benefit. They seek a closer union to an absolute, however labeled, and transcendence—a rising above myopic human affairs to an understanding and connection with the profound. Loriliai Biernacki describes how Eastern religions (with the exception of Buddhism) have emphasized a concept of self that encompasses all beings, all materiality, or all existence. Individuals are a part of that all-encompassing self but are typically suffering under the illusion of being separate from it. This duality, Claxton suggests, develops through our use of language that posits continually and pervasively from infancy that we embody a separate agent or self, and the metaphor becomes an unobserved, taken-for-granted reality. We are divided from the rest of existence and, having experienced the mystery of birth, are condemned to consciously face the terror of death—of our non-existence and complete separation from all we love and all that gives us meaning. The alternative perspective argues that all is integral and connected and that the illusion of our separateness is the problem. If we experience our indivisibility from and integral connection with all existence, our terrors, urgencies, anxieties, and illusions fall away. Rather than seeing ourselves as separate, we recognize that in essence we are of the same stuff as trees, rocks, planets, etc. We are of existence and manifestations of that universal self or Self. Rather than "Self" we could use the notion of interconnectedness.

From Eastern religion too comes the notion of a game of hide and seek that the Self, that is all existence, plays with itself. And as manifestations of that Self, we occasionally catch glimpses during the game but fail to complete the game by seeing that we are one with that Self—we are part of the Indra's Net of all existence—a net made up of an infinite number of multifaceted jewels that reflect all the other jewels. There are different accounts from different religions of this proposition, each with its own historical coding, but the concept is largely the same. Through practicing meditation religiously (in both senses), these traditions propose, we begin to see the illusion of notions of separation and of an imagined duality of the self and the rest of existence. Instead, we begin to develop awareness of the omnipresence of this Self that is all existence and our indivisibility from it. As an intriguing extension, Biernacki describes the idea from Kashmiri Tantra of our sharing an all-encompassing consciousness *that is continually evolving.* This is in contrast to other Eastern conceptions that see the universal, cosmic Self as unchanging.

Whatever, the idea is that meditation practice can help to free us from the imprisoning matrix of our self-concept in order to experience our indivisibility from and reassuring connection with all that is. Wonder arises, according to many practitioners and writers, when one accesses the sense of self in all its fullness through enlightenment experiences or the practice of meditation; then we understand not just intellectually but experientially our connection with all, and thereby our indivisibility from all.

These speculations, interpretations, philosophical explorations, and theoretical formulations outstrip the research evidence on the effects and processes of meditation and stray into the metaphysical. Now we pull the reader smartly back to the psychological by exploring the extent to which these themes are replicated in neuroscience research.

Neurophysiological research evidence

The fascination with brain studies of meditation that was evident in early research (Fenwick 1987) continues today. Antonino Raffone (Chapter 10) offers a clear review of the available evidence on the neuroscience of mindfulness meditation. A close reading of the relevant research is both intriguing and instructive. In another recent review of this work, Tang et al. (2015) point out the many research challenges in this area (not least the enthusiasm with which the media and practitioners respond to neuroscience findings relating to mindfulness and meditation). There is some evidence of changes in brain structure associated with meditation practice (Fox et al. 2014). Eight brain regions seem to be consistently affected: The front polar cortex, which might be related to

enhanced meta-awareness; the sensory cortices and insula, related to body awareness; the hippocampus, associated with memory processes; the anterior cingulate cortex, mid cingulate cortex, and orbitofrontal cortex, which are all areas related to self and emotion regulation; and the superior longitudinal fasciculus and corpus callosum, areas responsible for intra and inter-hemispheric communication (Fox et al. 2014). What these changes in brain structure mean is dependent upon how (and if) they relate to improvements in affective, cognitive, and social function.

Meditation is an attentional exercise and much research in the last ten years has focused on attentional control and neurophysiological correlates of such control. Several studies have shown that meditation practices are associated with improved conflict monitoring—the ability to resist the effects of distracting stimuli, to sustain attention on a specific focus, and to direct attention to relevant stimuli amongst a range of stimuli. Studies suggest that experienced meditators have enhanced activation of the anterior cingulate cortex, associated with executive attention and control (Tang et al. 2015). There is also evidence of diminished age-related decline in grey matter volume and associated diminished age-related decline in sustained attention performance (Pagnoni and Cekic 2007). Although these studies are encouraging, there is a need to determine whether the neurophysiological changes are related to improved attentional performance.

There is much research evidence for the effects of meditation on emotion regulation (Brown et al. 2007; Sedlmeier et al. 2012) and some evidence from neurophysiological studies of associated neural mechanisms. However, the research suggests the mechanisms may differ between novice and experienced meditators, with the prefrontal cortex more involved among the former (Tang et al. 2015). The findings are consistent with the descriptions earlier in this chapter that novice meditators begin by actively regulating cognitions in order to overcome habitual ways of reacting to thoughts and emotions, whereas expert meditators no longer use this form of control because they have developed an accepting approach toward their experience. There is accumulating evidence of structural changes in areas of the brain associated with emotion regulation following meditation practice but we still need to demonstrate whether these changes are linked to the positive effects of meditation on emotion regulation.

In relation to our discussions of self-awareness earlier, there is some evidence of structural changes following training in meditation in the default mode network of the brain, which is associated with self-referential processing. This research suggests diminished activity, consistent with the idea that meditation enables a detachment from concerns with self enhancement and the need to

identify with the self as a static entity (Brewer et al. 2011; Hasenkamp and Barselou 2012). There is also some evidence that core regions of the brain associated with awareness of present moment experience are affected by meditation practice. Studies suggest changes in the prefrontal cortex consistent with a more detached and objective awareness of physical, cognitive, and emotional sensations and imply the possibility of a state in which awareness itself becomes the subject of awareness (Farb et al. 2007; Josipovic 2014). The neuroscience of meditation suggests shifts in self-awareness such that the narrative, evaluative default option of experiencing self is replaced by both a greater detachment and awareness of the self and the present moment.

In summary, the best conducted studies of the neuroscience of meditation offer consistent evidence of changes in the anterior cingulate cortex, prefrontal cortex, posterior cingulate cortex, insula, striatum, and amygdala—key areas associated with self-regulation of attention, emotion, and awareness. Fascinating though all of this is, we are still scraping at the edges of this field of research and there is a need for many more rigorous and sophisticated studies to help us in our understanding.

A second theme in this volume is the clear distinction between meditation practice as a way of living or being and meditation practice as therapy for psychological, physical, or social disorders. What then of the therapeutic application of meditation and mindfulness practices?

Therapeutic applications

Vidyamala Burch's chapter (Chapter 7) provides a poignant and powerful insight into the reality of dealing with chronic pain, along with suggestions for how meditation may help in that process. The practice of meditation involves acceptance of whatever arises, from the minor discomfort associated with a stiff knee while sitting through to the fear of a sudden confrontation with the experience of the self and existence. Pain management involves the anticipation and acceptance of pain and learning to recognize that (like the self) it is changing rather than constant, temporary rather than permanent, and, to an extent, amorphous. As with our experience of the self, the more we seek to control, avoid, or diminish subjective experience, the more difficult and magnified it seems to become. And the theme of connection emerges in the consideration of pain with the notion that by learning to have compassion in relation to my own pain (paying attention to myself, having an empathic response, and taking intelligent action), I learn to be more compassionate to others in pain—paying attention to them, having an empathic response, and taking intelligent action to help (Gilbert 2013; Gilbert and Choden 2013).

Linda Carlson, in Chapter 9, echoes these themes. Physical illness often involves an associated loss of control, stress, feelings of uncertainty about the future, and profound existential worries, including fear of death. It involves coping with symptoms and often with noxious, painful treatments. Dealing with physical illness includes acceptance of change and uncertainty rather than resistance. And the research on physical illness that Linda Carlson reviews suggests some benefits of meditation practice, though the mechanisms by which these benefits occur are, for the most part, unclear. In the treatment of cancer, the use of mindfulness and meditation practices is associated with improvements in quality of life, emotional well-being, physical functioning, stress, anxiety, depression, fear, and avoidance. Meditation is not necessarily superior to cognitive behavioral therapy (CBT) or support groups but it offers an important alternative or complement to existing approaches. The evidence is on balance positive in relation to cancer care and irritable bowel syndrome (for example) but more questionable in relation to the treatment of heart disease, diabetes, and HIV. This chapter offers a valuable balance to the literature and popular writings that portray mindfulness as a miracle intervention, instead suggesting its value but cautioning about the need for more careful research.

Similarly, the chapter by Sarah Bowen and colleagues (Chapter 8) on addiction suggests some benefits of meditation practice for addictive disorders. The theme of developing awareness and nurturing a non-judgmental (accepting) orientation is echoed here in the sense that such processes help people to see the triggers for their addictive behaviors before they respond. The unfurling of the behavior is spotted earlier in the process, to use Guy Claxton's metaphor. And the evidence suggests that meditation and mindfulness practices are associated with reductions in the use of alcohol and illicit drugs, and may have positive effects for those with eating disorders. However, the research is at an early stage and meditation and mindfulness are often single components of complex programs of interventions such as acceptance and commitment therapy (ACT) and mindfulness-based stress reduction (MBSR) programs. It is difficult to disentangle the effects of mindfulness/meditation practice from the effects of the other elements of these interventions. For example, ACT has six core elements: Acceptance of experience; being present in the moment; living in accordance with one's values; committed action by setting goals and working to achieve them; self as context—being able to disengage from crippling self-conceptions; and cognitive defusion—learning to observe and dilute the effects of our ruminative preoccupations. Although mindfulness is important as a component in all of these elements, it is difficult to determine which elements (including mindfulness/meditation) are most potent in helping those with addiction.

And this observation applies to other areas within which meditation is used as a therapeutic intervention.

Lynn Waelde and Jason Thompson in Chapter 6 illustrate these points very clearly in their review of meditation and mindfulness as interventions in psychotherapy. Their review also provides a useful counterbalance to the cure-all claims associated with mindfulness and meditation in the popular press. The meta-analyses they report suggest that meditation and mindfulness, when applied in therapeutic contexts, do have small pre/post effects on depression, anxiety, and pain (Goyal et al. 2014). Mindfulness-based therapy is generally not significantly more effective than relaxation or cognitive behavioral therapy at follow-up, although the evidence suggests that mindfulness does have consistently positive effects (Khoury et al. 2013; Strauss et al. 2014). Their chapter echoes the themes we have heard in other chapters in this volume that mindfulness and meditation may produce its effects via attention regulation, enhanced body awareness, emotion regulation, and changes in the sense of self.

Meditation in applied settings

In the two chapters exploring the application of meditation and mindfulness in work and school settings, there is encouragement for practitioners and researchers to extend research. It is important to know, regardless of the more basic scientific questions about the precise mechanisms of efficacy, whether meditation and mindfulness can help create cultures in schools and workplaces that are more conducive to human well-being. Katherine Weare's chapter suggests the value of multi-component interventions in schools to create such cultures (in environments that often suppress learning, motivation, and growth) and argues for a growth in interventions and research. Frank Bond and colleagues in Chapter 11 describe their applications of acceptance and commitment therapy, with strong components of mindfulness, in the workplace. They have delivered such interventions to over 2000 employees across 50 organizations and trained hundreds of psychologists to use their interventions for people at work. And there is supporting evidence for the powerful effects of such interventions in the workplace. Fredrickson and colleagues (2008) conducted a study with 139 working adults, training them in loving kindness meditation and finding beneficial effects over time on positive emotions, mindfulness, purpose in life, social support, illness symptoms, life satisfaction, and depressive symptoms.

Both chapters provide impressive evidence of attempts to apply mindfulness and meditation practices in challenging environments where knowledge about

how to create conditions that enhance human well-being and flourishing is much needed. Schools and workplaces are often characterized by noise, frenetic activity, overwork, stress, anger, conflict, and abuse. Finding effective ways to create conditions that enhance well-being and growth and development is a core challenge for the discipline of psychology.

Personal meditation journeys

The themes identified across the chapters are replicated too in the contributors' accounts of their encounters and experiences with meditation practices and traditions over the years. These accounts vary enormously from initial encounters with transcendental meditation to reciting the "Ode on Melancholy" for weeks on end or practicing Zen meditation in South Korea. One contributor describes her nine-year-old self searching for adult library books on meditation and yoga and hoping the librarian would not confiscate them. This sense of calling to explore meditative traditions, try out meditation, or respond to the allure of the esoteric mirrors the theme of meditation as a component of spirituality, philosophy, or religion.

This is reflected too in the extraordinary dedication to their practice shown by the contributors. One travelled to Korea to become a nun and practiced meditation ten hours a day for six months a year for ten years. A number went to India—several times each ("so once again, I headed off to India"). Others sought out ashrams that offered yoga training and most dedicated thousands of hours of practice over the subsequent years. None were dilettantes—this experience became, in most cases, the grounding for a way of life: "It was the start of a decades-long immersion in Buddhist practice that included long periods of solitary retreat." They describe how, over time, they observed a consistent change in daily awareness, which became clearer and more powerful over time. It has become, for many, a core to their way of living, a key component of their days, and a core element in their philosophy of life. They describe the profound consequences for their life experience: "Meditation has been a touchstone for my mind and heart. Most importantly, it has introduced me to unprecedented and profound peace of mind, happiness, and love . . . the practice has woven itself into the fabric of my life." Another contributor described finding many benefits: ". . . deeper meaning of existence and . . . enhancement of awareness, wholesome mental states and attitudes, insights about conditioning of the mind . . . positive reverberations in relationships with others, such as in terms of more mindful, kind, and compassionate dispositions in the family and at work."

Why have they pursued meditation? Meditation for most has been an experiential/existential enquiry rather than merely a palliative or a therapy. They

describe learning the value of turning toward the difficult rather than trying to escape it, in sharp contrast to the idea of using meditation as a means for escaping from neurotic patterns or developing a "superimposed equanimity": "My mind could be a tool for healing and well-being and this was an astounding and unexpected discovery." As psychologists, most have sought synergy between their private meditation practice and their work, describing complementarities such as the "questioning and curiosity that is at the heart of both our meditation practice and the science with which we study it." And relishing the opportunity "to sit smack in the middle of human experience rather than endlessly theorizing from a safe distance." For others, there was also the opportunity to share their own learning about meditation and its benefits with others: "I was overjoyed to be able to apply what had become a central and very important part of my personal life . . ."; "The opportunity to share what I have gained in service to others is an ongoing creative process that gives my life tremendous meaning." Another described meditation as like becoming "a mountaineer of the inner world."

Such exploration has also been demanding: "It is not all nirvana. I struggle with deep aspects of my own shame and guilt, which come to greet me on the cushion." But there is wisdom too: ". . . the act of introspection is informed now by years of practice that has shown me the inner calm that emerges when I suspend the 'power of knowing' and attend kindly to this moment, this breath." And the discovery of powerful touchstones: "The best single advice I have is . . . smile and breathe . . . And if I do nothing else in the day, that is at least the way it starts."

The outcomes of their practices vary; some describe wisdom or a sense of "presence"; the experience of inner peace even during turbulent times; and of balance in the activities of daily life: "The meditation practices form an inner discipline and structure that help me weather all kinds of momentary and lasting difficulties"; "Infused into daily living, it has all seeped into my bones and given me a richer register of ways of being an ordinary human being." This slow infusion of awareness extended to the management of acute pain also: "The quiet miracle of my own improvement is the result of a steady application of gentle effort across a very broad front." Other outcomes relate to the simple yet important challenges of daily living: "My challenge is mindful parenting. I try every day to be in the moment with love and acceptance for my children, balancing this with necessary limits and boundaries." Another reflects that "I find I go mindfully about my daily life. Choosing what actions to take that are consistent with my values is very useful to me in creating a meaningful life." Particularly striking in all these accounts is how many of the contributors describe a sense of privilege,

gratitude, and joy—discovering, as one says: "Joy, the inner throb at the heart of everything, even sadness."

Conclusions: Meditation research and practice

In the preceding chapter, Peter Sedlmeier and colleagues summarized the challenges for a psychology of meditation, asking for methodologically better research. They seek research and research designs and methods that have the rigor and robustness to advance knowledge rather than only raise more questions (though looking back to the 1987 precursor to this volume, there has been huge progress). They also argue for better use of theory and new theory development, suggesting particularly the value of translating both ancient and modern Eastern theory into modern psychology. Using existing psychological theory to underpin research is vital if we are to avoid the trap of lapsing into the research question "Does it work?" And they suggest the value of co-designing and conducting research with experienced meditation practitioners in order that the gap between research and practice can be reduced.

The contributors to this book are all psychologists who conduct research into meditation and they are also practitioners of meditation. And it is striking how their dedication to both pursuits has invested an intensity into their work that is revealed in their writing. It is also striking that the research questions and methods they have adopted are (to an extent) divergent from the themes they describe in their personal journeys. There is a sense in which the perspectives of contemporary psychology constrain the questions that can be asked and the research designs that can be used in research in this area. The research they describe is generally of high quality and is helpful in advancing understanding, but there is something of a gap between their accounts of personal practice and experience, and the research approaches employed. This reflects the broader psychological research literature on meditation.

In another 25 to 30 years, perhaps we will see research that closes the gap between advances in understanding that arise from research and the perceptions of change in self, experience, and relationship with the world that meditation practitioners describe. Such research should help us to understand how the varieties of meditation practices across cultures and time, described in Chapter 1, affect our behavior and experience beyond a recognition that they are perceived as somehow important and experientially powerful. Are they at minimum simply a way of dealing with distress and unease? Or are they at most a means of learning to be present in this great mystery so we connect with each other, our planet, our universe, and our existence more effectively and compassionately?

References

Atkins, P. and Parker, S. (2012). Understanding individual compassion in organizations: The role of appraisals and psychological flexibility. *Academy of Management Review*, **37**(4), 524–546.

Brewer, J. A., Worhunsky, P. D., Gray, J. R. et al. (2011). Meditation experience is associated with differences in default mode network activity and connectivity. *Proceedings of the National Academy of Sciences*, **108**(50), 20254–20259.

Brown, K. W., Ryan, R. M., and Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry*, **18**(4), 211–237.

Farb, N. A., Segal, Z. V., Mayberg, H. et al. (2007). Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience*, **2**(4), 313–322.

Fenwick, P. (1987). Meditation and the EEG. In M. A. West (Ed.). (1987). *The psychology of meditation*, pp. 104–117. Oxford: Clarendon Press/Oxford University Press.

Fox, K. C., Nijeboer, S., Dixon, M. L. et al. (2014). Is meditation associated with altered brain structure? A systematic review and meta-analysis of morphometric neuroimaging in meditation practitioners. *Neuroscience and Biobehavioral Reviews*, **43**, 48–73.

Fredrickson, B. L., Cohn, M. A., Coffey, K. A. et al. (2008). Open hearts build lives: Positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of Personality and Social Psychology*, **95**(5), 1045.

Gilbert, P. (2013). *The compassionate mind*. London: Constable.

Gilbert, P. and Choden (2013). *Mindful compassion: Using the power of mindfulness and compassion to transform our lives*. London: Robinson.

Goyal, M., Singh, S., Sibinga, E. M. et al. (2014). Meditation programs for psychological stress and well-being: A systematic review and meta-analysis. *JAMA Internal Medicine*, **174**(3), 357–368.

Hasenkamp, W. and Barsalou, L. W. (2012). Effects of meditation experience on functional connectivity of distributed brain networks. *Frontiers in Human Neuroscience*, **6**, 38.

Josipovic, Z. (2014). Neural correlates of nondual awareness in meditation. *Annals of the New York Academy of Sciences*, **1307**(1), 9–18.

Khoury, B., Lecomte, T., Fortin, G. et al. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, **33**, 763–771.

Neff, K. D. and Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, **69**(1), 28–44.

Pagnoni, G. and Cekic, M. (2007). Age effects on gray matter volume and attentional performance in Zen meditation. *Neurobiology of Aging*, **28**(10), 1623–1627.

Salzberg, S. (2011). Mindfulness and loving-kindness. *Contemporary Buddhism*, **12**(1), 177–182.

Sedlmeier, P., Eberth, J., Schwarz, M. et al. (2012). The psychological effects of meditation: A meta-analysis. *Psychological Bulletin*, **138**(6), 1139.

Strauss, C., Cavanagh, K., Oliver, A., and Pettman, D. (2014). Mindfulness-based interventions for people diagnosed with a current episode of an anxiety or depressive disorder: A meta-analysis of randomised controlled trials. *PloS One*, **9**(4), e96110.

Tang, Y. Y., Hölzel, B. K., and Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, **16**(4), 213–225.

Watts, A. (2011). *The wisdom of insecurity: A message for an age of anxiety*. New York, NY: Vintage.

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