

Mindfulness-Based Interventions in Context: Past, Present, and Future

Jon Kabat-Zinn, University of Massachusetts
Medical School

For Francisco Varela, 1945–2001

Baer's review (2003; this issue) suggests that mindfulness-based interventions are clinically efficacious, but that better designed studies are now needed to substantiate the field and place it on a firm foundation for future growth. Her review, coupled with other lines of evidence, suggests that interest in incorporating mindfulness into clinical interventions in medicine and psychology is growing. It is thus important that professionals coming to this field understand some of the unique factors associated with the delivery of mindfulness-based interventions and the potential conceptual and practical pitfalls of not recognizing the features of this broadly unfamiliar landscape. This commentary highlights and contextualizes (1) what exactly mindfulness is, (2) where it came from, (3) how it came to be introduced into medicine and health care, (4) issues of cross-cultural sensitivity and understanding in the study of meditative practices stemming from other cultures and in applications of them in novel settings, (5) why it is important for people who are teaching mindfulness to practice themselves, (6) results from 3 recent

Address correspondence to Jon Kabat-Zinn, c/o Center for Mindfulness in Medicine, Health Care, and Society, University of Massachusetts Medical School, Shaw Building, 55 Lake Avenue North, Worcester, MA 01655.

studies from the Center for Mindfulness in Medicine, Health Care, and Society not reviewed by Baer but which raise a number of key questions about clinical applicability, study design, and mechanism of action, and (7) current opportunities for professional training and development in mindfulness and its clinical applications.

Key words: mindfulness, meditation, mind/body medicine, mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT). [*Clin Psychol Sci Prac* 10: 144–156, 2003]

I appreciate the opportunity to comment on Baer's (2003; this issue) review of mindfulness training as clinical intervention and to add my own reflections on the emergence of mindfulness in a clinical context, especially in a journal explicitly devoted to both science and practice. The universe of mindfulness¹ brings with it a whole new meaning and thrust to the word *practice*, one which I believe has the potential to contribute profoundly to the further development of the field of clinical psychology and its allied disciplines, behavioral medicine, psychosomatic medicine, and health psychology, through both a broadening of research approaches to mind/body interactions and the development of new classes of clinical interventions.

THE GROWING INTEREST IN MINDFULNESS

I find the Baer review to be evenhanded, cogent, and perceptive in its description and evaluation of the work that has been published through the middle of 2001, work that features mindfulness training as the primary element in various clinical interventions. It complements nicely the recent review by Bishop (2002), which to my mind ignores some of the most important, if difficult to define, features of such interventions in its emphasis on the perceived need

to reduce to a clinical algorithm the complexity of the practice and nuanced delivery of mindfulness-based stress reduction (MBSR).

Both Baer and Bishop pose important questions that require addressing if researchers and clinicians are ultimately to understand mindfulness and its clinical utility. Both reviews agree that the scientific study of mindfulness and MBSR to date suffers from a range of methodological problems, a view with which I concur. When a field is in its infancy, it is not uncommon for the first generation of studies to be more descriptive of the phenomenon rather than definitive demonstrations of efficacy. Attempts at the latter tend to evolve over time after the potential value of a new approach has been at least tentatively established. This now appears to be the case with mindfulness-based interventions. Both Baer and Bishop conclude that enough evidence has now accumulated to warrant the development of more methodologically rigorous investigations of both the clinical efficacy of mindfulness training in various specific disorders and the possible mechanisms and pathways through which it might exert characteristic effects within those specific disorders.

The very fact that an increasing number of studies on mindfulness and its clinical applications are being funded and published and that an increasing number of doctoral theses on mindfulness are appearing in Dissertation Abstracts suggests that this is an area that is currently sparking considerable interest, perhaps driven primarily by the intuition that new dimensions of therapeutic benefit and novel insights into mind/body interactions might accrue through its exploration. Because interest in mindfulness and its applications to specific affective conditions is likely to increase even further, particularly within the cognitive therapy community with the development of mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002) and with the use of mindfulness within dialectical behavior therapy (DBT; Linehan, 1993), it becomes critically important that those persons coming to the field with professional interest and enthusiasm recognize the unique qualities and characteristics of mindfulness as a meditative practice, with all that implies, so that mindfulness is not simply seized upon as the next promising cognitive behavioral technique or exercise, decontextualized, and “plugged” into a behaviorist paradigm with the aim of driving desirable change, or of fixing what is broken.

WHAT EXACTLY IS MINDFULNESS, AND WHERE DOES IT COME FROM?

As pointed out by Baer, mindfulness has to do with particular qualities of attention and awareness that can be cultivated and developed through meditation. An operational working definition of mindfulness is: the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment. Historically, mindfulness has been called “the heart” of Buddhist meditation (Thera, 1962). It resides at the core of the teachings of the Buddha (Gunaratana, 1992; Hanh, 1999; Nanamoli & Bodhi, 1995), traditionally described by the Sanskrit word *dharma*, which carries the meaning of *lawfulness* as in “the laws of physics” or simply “the way things are,” as in the Chinese notion of *Tao*. One might think of the historical Buddha as, among other things, a born scientist and physician who had nothing in the way of instrumentation other than his own mind and body and experience, yet managed to use these native resources to great effect to delve into the nature of suffering and the human condition. What emerged from this arduous and single-minded contemplative investigation was a series of profound insights, a comprehensive view of human nature, and a formal “medicine” for treating its fundamental “dis-ease,” typically characterized as the three “poisons”: greed, hatred (aversion), and ignorance/delusion (unawareness).

Of course, the Buddha himself was not a Buddhist. One might think of *dharma* as a sort of universal generative grammar (Chomsky, 1965), an innate set of empirically testable rules that govern and describe the generation of the inward, first-person experiences of suffering and happiness in human beings. In that sense, *dharma* is at its core truly universal, not exclusively Buddhist. It is neither a belief, an ideology, nor a philosophy. Rather, it is a coherent phenomenological description of the nature of mind, emotion, and suffering and its potential release, based on highly refined practices aimed at systematically training and cultivating various aspects of mind and heart via the faculty of mindful attention (the words for mind and heart are the same in Asian languages; thus “mindfulness” includes an affectionate, compassionate quality within the attending, a sense of openhearted, friendly presence and interest). And mindfulness, it should also be noted, being about attention, is also of necessity universal. There is nothing particularly Buddhist about it. We are all mindful

to one degree or another, moment by moment. It is an inherent human capacity. The contribution of the Buddhist traditions has been in part to emphasize simple and effective ways to cultivate and refine this capacity and bring it to all aspects of life. In this regard, mindfulness certainly received its most explicit and systematic articulation and development within the Buddhist tradition over the past 2,500 years, although its essence lies at the heart of other ancient and contemporary traditions and teachings as well, approaches that can be of great value in refining one's own practice, insight, and teaching (see, for example, Chuang Tsu, 1964; Krishnamurti, 1999; Lao-tsu, 1988; Maharaj, 1973; Maharshi, 1959; Thakar, 1972; Tolle, 1999).

Mindfulness is the fundamental attentional stance underlying all streams of Buddhist meditative practice: the Theravada tradition of the countries of Southeast Asia (Thailand, Burma, Cambodia, and Vietnam); the Mahayana (Zen) schools of Vietnam, China, Japan, and Korea; and the Vajrayana tradition of Tibetan Buddhism found in Tibet itself, Mongolia, Nepal, Bhutan, Ladakh, and now large parts of India in the Tibetan community in exile. It should be noted that these traditions all have various schools, subtraditions, and particular texts that they revere more than others, so the actual practices and emphases regarding mindfulness can vary considerably, even within one tradition, such as Theravada or Zen (Goldstein, 2002). Nevertheless, mindfulness, as elucidated by the Buddha in two discourses, the Anapanasati Sutra (Rosenberg, 1999) and the Satipathana Sutra (Thera, 1962), is the core teaching and constitutes the foundation upon which all of these various forms and traditions rest. In these traditions the actual practice of mindfulness is, however, always nested within a larger conceptual and practice-based ethical framework oriented towards nonharming (an orientation it shares with the Hippocratic tradition of Western medicine). This "view" includes a skillful understanding of how unexamined behaviors and what Buddhists would call an untrained mind can significantly contribute directly to human suffering, one's own and that of others. It also includes the potential transmutation of that suffering through meditative practices that calm and clarify the mind, open the heart, and refine attention and action.

Over the past 40 years or so all of these Buddhist traditions have taken root in the West to one degree or another (Bachelor, 1994; Fields, 1992), and have by this time been taken up by several generations of Westerners, who practice these methods in their own lives on a daily basis as well

as through participation in periodic teacher-led, intensive meditation retreats, which can last from a weekend to 3 months or more (see, for example, Goldstein, 1987; Goldstein, 2002; Goldstein & Kornfield, 1987; Walsh, 1977, 1978). This phenomenon represents a cultural shift that may be only in its infancy. Nevertheless, it provides a range of rich resources for personal practice and dialogue that can contribute toward the training and development of a cohort of highly competent teachers, from a wide variety of professional backgrounds, committed to the effective delivery of authentic mindfulness-based interventions in various settings.

Mindfulness is often spoken of synonymously as "insight" meditation, which means a deep, penetrative non-conceptual seeing into the nature of mind and world. This seeing requires a spirit of perpetual and persistent inquiry—as in, "What is this?"—toward whatever arises in awareness, and toward "who is attending," "who is seeing," "who is meditating." Its role in deep inquiry and the cultivation of insight have led some to argue that that mindfulness provides a unique perspective that can inform critical issues in cognitive science, neurophenomenology, and attempts to understand the cognitive underpinnings of the nature of human experience itself (Varela, Thompson, & Roach, 1991).

CROSS-CULTURAL AND PARADIGM ISSUES IN WORKING WITH THE CONSCIOUSNESS DISCIPLINES

From the perspective of the behavioral sciences, mindfulness can be thought of as a "consciousness discipline," as described by Walsh in a seminal paper (Walsh, 1980) that explicates the generic paradigm of the meditative traditions and their associated disciplines and shows how such disciplines might be approached empirically by the behavioral sciences without falling into paradigm clash or a range of category errors, which can unwittingly ignore or dismiss the deepest and most subtle features of such practices, thereby predisposing investigators to draw erroneous conclusions. Thus, in encountering the consciousness disciplines and the question of their possible adaptation and application in secular clinical or medical contexts, it is critically important to treat mindfulness and the traditions that have articulated it much as a respectful anthropologist would treat an encounter with an indigenous culture (Davis, 1998) or a different epistemology (Zajonc, 2000). This intimate sensitivity will be necessary to understand, evaluate, and preserve essential elements of the universal

dharma dimension of mindfulness practice as it is analyzed by and incorporated into Western science. It in no way contradicts the call by Hayes (2002) to find ways to fit practices and knowledge from spiritual traditions into the theoretical matrix of scientific psychology. The challenge is to find a fit that honors the integrity of what may be different but complementary epistemologies.

It should be noted in this regard that, in the cross-cultural context of scientific studies of Tibetan monks practicing meditation, sensitivity to differences in orientation and motivation between neuroscientists and meditators around both the meditation practices and the set and setting in which they are investigated is essential for the investigation to have integrity and to be interpretable and valid from the perspective of both the scientists and the meditators (Houshmand, Harrington, Saron, & Davidson, 2002). In a recent “cross-cultural” development of note, EEG, fMRI, and PET studies of brain activity in the evocation of specific meditative states and positive feelings, such as compassion and devotion, in a highly trained long-term monastic practitioner (a Western Lama in the Tibetan tradition with a doctorate in molecular biology) have engaged the meditator not merely as subject but as a full collaborator in the design and interpretation of these investigations with his scientific counterparts, capitalizing as well on his highly developed ability to give a precise account of his mental activity during various practices. These investigations show a range of stable patterns of brain activity (“neural signatures of different mental states”) that have never been observed in naive subjects, patterns that can be replicated by the subject at will, depending on his choice of meditative practice. Such studies have multiple implications for research in affective neuroscience, neuroplasticity, and our understanding of what might be possible through specific kinds of training regarding the ways we process and express emotion (Goleman, 2003). They assume practical relevance in light of brain changes reflecting enduring shifts in the processing of negative emotion under stress, which have been observed in novice meditators following training in MBSR in an 8-week worksite intervention (Davidson, Kabat-Zinn, Schumacher, Rosenkranz, Muller, Santorelli, et al., in press).

THE MEANING OF “PRACTICE” IN THE CONTEXT OF MINDFULNESS MEDITATION

If we hope to understand mindfulness meditation, it behooves us to examine the use of the word practice and its

meaning as it refers to the meditative traditions and the consciousness disciplines that form their core. We speak of the “practice” of meditation, and the “practice” of mindfulness, meaning the actual engagement in the discipline, the inward gesture that invites and embodies it (Depraz, Varela, & Vermersch, 2000). It is not used in the common sense of “rehearsal” for some future performance. The “performance” is always this moment unfolding (Kabat-Zinn, 1994). This engagement takes a variety of forms, from a range of formal practices that are undertaken for varying periods of time on a regular basis, to informal practices that are aimed at cultivating a continuity of awareness in all activities of daily living. However, mindfulness meditation practice, whether within the various Buddhist traditions or within the context of MBSR, for instance, is not limited to the operationalization of particular techniques, which, however important and essential, which they are, are also merely launching platforms or particular kinds of scaffolding to invite cultivation and sustaining of attention in particular ways. They are the menu, so to speak, not the meal; the map, rather than the territory, the traditional admonition being not to mistake the finger pointing at the moon for the moon.

In a recent commentary in this journal on the subject of mindfulness and generalized anxiety disorder, Borkovec (2002) describes in whimsical but cogent and insightful detail the emotional consequences of living with a trust that, he says, “allows me to let go of the illusory future and past and to focus on the nonillusory present.” Using examples of washing the dishes and of writing a National Institute of Mental Health (NIMH) grant, he unpacks various cognitive sets that either create anxiety about future outcomes, or keep him grounded in the process itself (the present moment) and its intrinsic meaning and pleasures. He states,

If a focus on the outcome and the extrinsic aspects of an activity are conducive to anxiety and depression, then the objective quality of my work, whether washing dishes or writing grant proposals, will likely be lowered, given what we know about the adverse effects of negative emotion on performance. So seeking the extrinsic outcome makes the failure to achieve that outcome more likely. A focus on the process and intrinsic qualities of an activity reduces the likelihood of anxiety and depression (thus eliminating their negative impact on performance), increases the pleasure of joy during the process, and thus increases the likelihood of achieving the extrinsic outcome. I have to let go of the desired outcome

in order to acquire it. What a paradoxical and strange way to live. (pp. 79–80)

I would add only that it is perhaps a sane way to live that may not be so strange once one begins to inhabit that landscape in a more regular way. Perhaps it is only strange in a society that persists in devaluing the present moment in favor of perpetual distraction, self-absorption, and addiction to a feeling of “progress.” Although Borkovec’s descriptions of his inner process are compelling, it is unlikely that such process would be sustained or developed over time in most of us without some element of intentional practice (it is not enough as a rule to remind oneself to “just let go,” especially when one is little aware of how attached one may be and, also, how blind to being caught up in habitual patterns of thinking and emotional expression). It is here that the cultivation of the inner orientation of which Borkovec speaks is so important. Mindfulness is not merely a good idea such that, upon hearing about it, one can immediately decide to live in the present moment, with the promise of reduced anxiety and depression and heightened performance and life satisfaction, and then instantly and reliably realize that state of being. Rather, it is more akin to an art form that one develops over time, and it is greatly enhanced through regular disciplined practice, both formally and informally, on a daily basis.

This challenge we pose to our patients in the Stress Reduction Clinic at the very beginning, and with the introduction of the body scan meditation, or even the process of eating one raisin mindfully: namely, to let go of their expectations, goals, and aspirations for coming, even though they are very real and valid, to let go—momentarily, at least—even of their goal to feel better or to be relaxed in the body scan, or of their ideas about what raisins taste like, and to simply “drop in” on the actuality of their lived experience and then to sustain it as best they can moment by moment, with intentional openhearted presence and suspension of judgment and distraction, to whatever degree possible. Mindfulness develops and deepens over time but invariably requires an ongoing commitment to its practice and cultivation in any and every moment.

PRACTICE WITHOUT ATTACHMENT TO OUTCOME

In fact, the term “practice” used in this way is better understood as a way of being, a way of seeing, which is embodied, inhabited, grown into through the implementation of

the methods and techniques that comprise the discipline (Kabat-Zinn, 2003). There is a major role for paradox here, so Borkovec’s noting of it is quite relevant. Indeed, paradox is built in, since the ultimate understanding one encounters through paying attention transcends even conventional subject-object duality. From the outset of practice we are reminded that mindfulness is not about getting anywhere else or fixing anything. Rather, it is an invitation to allow oneself to be where one already is and to know the inner and outer landscape of the direct experience in each moment. This implies waking up to the full spectrum of our experience in the present moment, which, as we engage in mindfulness practice, we rapidly discover is severely edited and often distorted through the routinized, habitual, and unexamined activity of our thoughts and emotions, often involving significant alienation from direct experience of the sensory world and the body.

In my experience, an understanding of these considerations is critical, both to the development of clinical interventions that authentically nurture mindfulness and speak with compelling, sustained relevance to the lives and needs of potential participants, and to the scientific paradigm for its study. This emphasis on nonattachment to outcome is a radical departure from most clinical interventions. Yet it can be found at the heart of Jacobson’s pioneering work (1938), which emphasized learning to recognize and trust the direct proprioceptive experience of the landscape of sensation within tension rather than striving to achieve a more desirable state, such as relaxation. It was only when his method was condensed into progressive muscle relaxation (PMR) in the service of systematic desensitization (Wolpe, 1958) that the nonstriving, slow, mindful element was, ironically, abandoned—probably unwittingly—in favor of time efficiency and, with it, the primacy of the experiencing of the sensations themselves, without judgment or editing (see Woolfolk & Lehrer, 1984).

ORIGINAL VISION AND RATIONALE FOR MBSR

The intention in developing MBSR in 1979 and offering it through an outpatient stress reduction clinic at the University of Massachusetts Medical Center was twofold, as explained below.

MBSR as a training vehicle for the relief of suffering. The primary intention was to see if it were possible to create a vehicle for the effective training of medical patients in rel-

atively intensive mindfulness meditation (including mindful hatha yoga) and its immediate applications to the stress, pain, and illness people were grappling with in their lives. The intervention needed to be free of the cultural, religious, and ideological factors associated with the Buddhist origins of mindfulness, because the objective was not to teach Buddhism or even “to make great meditators” out of people, but to offer an environment within which to experiment with a range of novel and potentially effective methods for facing, exploring, and relieving suffering at the levels of both body and mind, and understanding the potential power inherent in the mind/body connection itself in doing so. At the same time, the program needed to remain faithful in both spirit and substance to the universal dharma dimension alluded to, which, as noted, lies at the very core of the gesture of mindfulness. The task, which is always ongoing and immediate for the MBSR instructor, is to translate the meditative challenges and context into a vernacular idiom, vocabulary, methods, and forms which are relevant and compelling in the lives of the participants, yet without denaturing the dharma dimension. This requires some degree of understanding of that dimension, which can come about only through exposure and personal engagement in practice—learned or deepened either through meditation retreats at Buddhist centers or through professional training programs in MBSR with teachers who have themselves trained in that way, or, ideally, both.² The Stress Reduction Clinic requires extensive grounding in mindfulness practice as one criterion in hiring new teachers. The standards we employ are outlined in a series of recommendations for assessing teaching readiness and competency in MBSR instructors in general (Santorelli, 2001).

The Stress Reduction Clinic, embedded within a department of medicine and a division of preventive and behavioral medicine, was originally designed to serve as a referral service for physicians and other health providers, to which they could send medical patients with a wide range of diagnoses and conditions who were not responding completely to more traditional treatments, or who were “falling through the cracks” in the health care system altogether and not feeling satisfied with their medical treatments and outcomes. MBSR was thus framed from the beginning as a generic challenge to each patient to train in ancient and potentially transformative meditative practices as a complement to his or her medical treatments (Kabat-

Zinn, 1993). The clinic, in the form of an 8-week course for outpatients, was meant to serve as an educational (in the sense of inviting what is already present to come forth) vehicle through which people could assume a degree of responsibility for their own well-being and participate more fully in their own unique movement towards greater levels of health by cultivating and refining our innate capacity for paying attention and for a deep, penetrative seeing/sensing of the interconnectedness of apparently separate aspects of experience, many of which tend to hover beneath our ordinary level of awareness regarding both inner and outer experience (Kabat-Zinn, 1990; Santorelli, 1999).

MBSR as a model. If the experience was “successful” in terms of acceptability of the process to the participants and the referring physicians, and in terms of attaining measurable outcomes of clinical significance, the second intention in developing MBSR was that the program might serve as a model for other hospitals and medical centers, which indeed has proved to be the case, and would be adaptable to other contexts in which stress, emotional and physical pain, or illness and disease were primary concerns. To this end, the clinic eventually developed a range of professional training programs in MBSR.³ Mindfulness-based programs are now offered in hospitals and clinics around the world, as well as in schools, workplaces, corporate offices, law schools, adult and juvenile prisons, inner city health centers, and a range of other settings.

SOME CHALLENGES ASSOCIATED WITH TEACHING MINDFULNESS-BASED INTERVENTIONS

It should be clear from what has been said that mindfulness, from our point of view, cannot be taught to others in an authentic way without the instructor’s practicing it in his or her own life. Mindfulness meditation is not simply a method that one encounters for a brief time at a professional seminar and then passes on to others for use as needed when they find themselves tense or stressed. It is a way of being that takes ongoing effort to develop and refine, in T. S. Eliot’s apt phrase, “A condition of complete simplicity / (Costing not less than everything)” (Eliot, 1943). It is both the work of a lifetime and, paradoxically, the work of no time at all—because its field is always this present moment in its fullness. This paradox can be understood and embodied only through sustained personal practice over days, weeks, months, and years.

Recall that practice as we have been using the word is not a mechanical self-repetition of meditation instructions (although it can sometimes subtly feel that way), but a commitment to reside as best one can from moment to moment in awareness with an open heart, a spacious, non-judging, nonreactive mind, and without trying to get anywhere, achieve anything, reject anything, or fall into either the stream of conceptual thought or what the Dalai Lama calls “afflictive” or “unwholesome” emotions (Goleman, 1997, 2003). Since it is virtually inevitable that people will fall into both the stream of conceptual thought and afflictive emotions (and potentially unwise actions) over and over again, the practice involves working intimately and compassionately with whatever arises in the field of awareness, so that whatever arises is seen and known (recognized) in the field of awareness as it arises (or as soon as one can). Thus, mindfulness can always be large enough to include whatever arises if it can be seen, felt, and known nonconceptually, directly apprehended through the five senses (including proprioception) and through the mind, which in Buddhism is considered another sense door. However, it takes personal commitment and perseverance in formal practice gradually to establish a degree of stability in one’s capacity to attend, especially to stressful or aversive objects, including severe emotional turbulence or enduring dysphoria, and to see beneath the surface of the phenomena themselves as they arise in the field of experience. Classes and periodic retreats form a supportive group environment within which practice can develop and deepen over time for both teachers and students of mindfulness. A working principle for MBSR teachers is that we never ask more of our patients in terms of practice than we ask of ourselves on a daily basis. Another is that we are all students and the learning and growing are a lifelong engagement.

The decision to teach mindfulness, even among those teachers with many years of personal meditation practice, whether they be trained as psychologists, physicians, surgeons, or other health professionals, can at times be intimidating and humbling, and understandably so. One needs to be well prepared to take on such a challenge, and that usually includes feeling that one is nowhere near ready to begin teaching. In our experience, unless the instructor’s relationship to mindfulness is grounded in extensive personal practice, the teaching and guidance one might bring to the clinical context will have little in the way of appropriate energy, authenticity, or ultimate relevance, and that deficit will soon be felt by program participants. For how

can one ask someone else to look deeply into his or her own mind and body and the nature of who he or she is in a systematic and disciplined way if one is unwilling (or too busy or not interested enough) to engage in this great and challenging adventure oneself, at least to the degree that one is asking it of one’s patients or clients? How will one know how to respond appropriately and specifically to their questions if one cannot draw on one’s own lived experience, not just on book knowledge and concepts, when the practice itself is all about seeing clearly and transcending (not getting caught up in and blinded by) the limitations of the conceptual mind while, of course, not rejecting the conceptual mind or the power and utility of thought within the larger context of awareness?

Since people with stress, pain, and medical conditions of all sorts invariably and quite naturally come to stress reduction or to various forms of therapy with agendas and goals (and, in fact, are encouraged to define realistic goals for themselves in MBSR), how will a teacher skillfully reconcile their motivation to achieve these perfectly sensible goals with the orientation of nonstriving, nondoing, and letting go that must inform the meditation practice and the entire program if it is to be mindfulness? It can be done only if one feels a deep experience-based confidence in the practice and an equally deep humility in offering it to others, developed through one’s own intimate engagement and struggles with it. Ultimately, one teaches out of one’s own passion for the practice itself, keeping things grounded in the actuality of present-moment experience. Of course, a skillful teacher will bring in any number of things as appropriate to inform and round out the teaching, dialogue, and practice itself, drawing on his or her extensive professional and personal knowledge base, temperament, and skills. However, without the foundation of personal practice and the embodying (a preferable term to “modeling,” which carries the unfortunate connotation of intentionally acting in a particular way for the sake of appearances) of what it is one is teaching, attempts at mindfulness-based intervention run the risk of becoming caricatures of mindfulness, missing the radical, transformational essence and becoming caught perhaps by important but not necessarily fundamental and often only superficial similarities between mindfulness practices and relaxation strategies, cognitive-behavioral exercises, and self-monitoring tasks.

Over the past 10 years numerous health professionals have taken on the teaching of mindfulness-based stress reduction and have developed well-established clinical and

research programs. Although there is no formal vehicle for assessing competency of MBSR teachers at this time, nor a professional credentialing mechanism,⁴ the feedback from the people coming out of these programs, when we have occasion to meet them, tends to be highly enthusiastic and positive. They themselves tend to speak of the experience as transformative. There is a sense among those of us teaching mindfulness that we continue to be nurtured personally and professionally by the work itself and by the practice. This, and a sense of connectedness with local and global communities of colleagues who do this work are constant reminders of the importance of staying true to the spirit of mindfulness practice.

RECENT RESULTS FROM THE CENTER FOR MINDFULNESS AND THEIR IMPLICATIONS FOR THE SCIENCE OF THE MIND/BODY CONNECTION AND FURTHER STUDIES

From a research perspective, work at the Center for Mindfulness and the Stress Reduction Clinic has attempted to provide various platforms upon which increasingly rigorous explorations of aspects of mindfulness and its clinical and social applications could ultimately be built. A number of early descriptive studies, reviewed by Baer (2003), attempted to investigate the validity and short- and long-term clinical effectiveness of the MBSR intervention in patients with a wide range of medical conditions (Kabat-Zinn, 1982; Kabat-Zinn, Chapman, & Salmon, 1997; Kabat-Zinn & Chapman-Waldrop, 1988; Kabat-Zinn, Lipworth, & Burney, 1985; Kabat-Zinn, Lipworth, Burney, & Sellers, 1986; Kabat-Zinn et al., 1992; Salmon, Santorelli, & Kabat-Zinn, 1998; Miller, Fletcher, & Kabat-Zinn, 1995;). This work eventually led us to undertake several small randomized trials, one with patients with moderate to severe psoriasis undergoing ultraviolet phototherapy treatments (Kabat-Zinn et al., 1998), the other a worksite intervention in which we delivered the 8-week MBSR program to company employees and monitored quantitative EEG and immune responsivity at various times, as well as a range of psychosocial measures (Davidson et al., in press). These studies demonstrated clinical effectiveness with two very different mindfulness-based interventions: one delivered in isolation solely by audiotaped instructions; the other, in the group context of MBSR. Their designs may serve as models in the design of further and larger studies of the potential healing and restorative effects of mindfulness and MBSR for different classes of individuals

with different life situations in different environments. These studies are described below in some detail.

Skin Clearing in Psoriasis

In the psoriasis study we asked if mindfulness could influence a healing process that we could see and photograph in people with a skin disease that has a strong relationship with psychological stress, namely, psoriasis. Thirty-seven patients with moderate to severe psoriasis who were candidates for treatment with phototherapy (UVB) or photochemotherapy (PUVA) were randomized into two groups. One group (meditators) followed guided mindfulness meditation instructions delivered by audiotape during their ultraviolet (UV) treatments (either PUVA or UVB) on a 3-times-per-week protocol. (For full study design and methods, see Kabat-Zinn et al., 1998). This tape included a guided visualization in which the subject visualized the ultraviolet light slowing down and then stopping the rapidly growing cells in the epidermis. The other group (usual care) received the light treatments (either PUVA or UVB) without listening to a tape. The skin status of each patient was monitored by clinic nurses at each treatment session and documented periodically by photography. The photographs were rated in terms of skin status by dermatologists blind to the identity and group assignment of the patients. These ratings were then used to validate or invalidate the nurses' necessarily unblinded ratings. A Cox proportional hazards analysis of the photographically validated data showed that the meditators' skin cleared at about 4 times the rate of the nonmeditators' (usual care group) during the 12-week study period ($p = .033$). An earlier and smaller study (Bernhard, Kristeller, & Kabat-Zinn, 1988) also found that the meditators' skin cleared more rapidly than that of the nonmeditators.

Although both studies suffer from a small sample size, the replicability of the finding suggests that the effect is real and merits further research. We cannot conclude from these observations that it is the mindfulness practice per se that is responsible for the fourfold rate of skin-clearing in the meditation cohort, although that is our hypothesis. However, the finding does lead to a number of potentially important, if currently tentative conclusions: (1) that some factor or combination of factors having to do with the activity of mind can positively influence a healing process in a specific disease; (2) that psychological participation of this sort on the part of the patient during the light treatments can lead to reduced time to clearing in at least some

patients, and thus to fewer treatments, and thus to potential cost savings; (3) that the need for fewer light treatments also reduces the risk of basal cell carcinoma associated with ultraviolet light treatment; (4) that social support—minimal in this intervention because the patient is isolated in the light box, there is no group experience, and all the instruction in the meditation is by audiotape—cannot be a major factor in the observed outcome; (5) that the experimental design itself is well suited for studying the role of the mind (intention, attention, belief, expectation, psychological conditioning, meditation, visualization) in a readily observable healing process for a specific disease down to the level of gene expression, including concurrent investigation of appropriate biological mediators associated with psoriasis, such as cytokines, transforming growth factor (TGF- α), and Bcl-x protein; (7) that, since psoriasis is an uncontrolled cell proliferation, although not oncogenic, such investigations may shed light on the potential for positive psychological involvement in oncogenic processes, such as basal cell carcinoma, which shares some molecular characteristics with psoriasis; and (8) that this design is an example of both integrative (Snyderman & Weil, 2002) and participatory (Kabat-Zinn, 2000) medicine: integrative because the meditative (unconventional) intervention is coextensive in time and place with the allopathic treatment, and participatory because the full engagement of the patient's mind and body is a critical part of the psychological intervention. All of these areas suggest further studies that might illuminate critical issues in mind/body medicine and adjunctive psychological approaches to patient care and treatment, including mindfulness-based approaches with specific diseases.

Our 1998 study was criticized by Relman on various methodological grounds, including the small sample size, the way we accounted for dropouts, the effectiveness of the blinding of physician-evaluators, and our statistical treatment of the data. He also took umbrage at our conclusions. While recognizing the validity of some of his criticisms, we were able to respond to each one, refuting their criticality either to the basic observation or to our conclusions (see Relman, Riley, Kabat-Zinn & Hosmer, 2001). I cite this interchange because it highlights the degree of controversy that occasionally arises, particularly regarding the quality of the evidence in studies investigating mind/body phenomena. Such controversy extends beyond the psoriasis study. Relman also challenged the validity of the findings and conclusions of much larger clinical trials and epidemio-

logical studies that are widely accepted in behavioral medicine (see "The Great Debate": Relman & Angell, 2002; Williams and Schneiderman, 2002).

Debates of this kind are welcome and healthy for any field of research. They certainly underscore the importance of larger and better designed studies to further establish or dispute findings in the nascent field of mindfulness-based clinical interventions and their potential therapeutic effects in people with specific medical and psychological conditions, as called for by Baer (2003) and Bishop (2002). They also illuminate the degree to which well-trained scientists can and should disagree about the evidentiary status underpinning even widely accepted phenomena in the behavioral and human sciences.

Brain, Immune Changes, and Emotional Processing in a Work Site MBSR Program

In another study (Davidson et al., in press) 41 employees of a biotechnology company were randomized to either an MBSR condition ($n = 25$) or a wait-list condition ($n = 16$). The MBSR subjects participated in an 8-week program during working hours. All subjects underwent extensive laboratory testing on three occasions, pre and post the 8-week intervention period and at 4-month follow-up, including EEG to measure brain electrical activity in response to various emotional challenges. All subjects were also vaccinated with influenza vaccine at the end of the 8-week intervention period and subsequently tested for antibody titer.

As originally hypothesized, we found significant increases in left-sided activation in the anterior cortical area in the subjects who had undergone MBSR training as compared to the wait-list controls. Left-sided activation in several anterior regions has been observed during certain forms of positive emotional expression and in subjects with more dispositional positive affect (Davidson, 1992; Davidson, Ekman, Saron, Senulis, & Friesen, 1990), as well as in studies of the highly trained Tibetan monk cited earlier, in whom the effect was of remarkable magnitude (Goleman, 2003). Right-sided activation is usually associated with negative emotional expression such as anger, anxiety and depression (Davidson, 2000; Davidson & Irwin, 1999).

We also found that the meditators displayed a significantly greater rise in antibody titers from the 4-week post-vaccination to the 8-week blood draw as compared to control subjects. Moreover, among the subjects in the MBSR group, those who showed the greatest pre-to-post

increase in left-sided activation displayed a significantly larger rise in antibody titers, whereas there was no significant relationship for control subjects. This study suggests that MBSR training can lead to brain changes consistent with more effective handling of negative emotion under stress. These changes endured for at least 4 months after the intervention.

To our knowledge, this study is the first to demonstrate a reliable effect of meditation on an *in vivo* measure of immune function and on anterior activation asymmetry in the brain. The results suggest that there may be multiple biological consequences of mindfulness training relevant to emotional and physical health, and that such an intervention can be delivered effectively in a work setting to a broad spectrum of employees and influence psychological and emotional health under stressful conditions. In light of the findings of Teasdale et al. (2000) and the development of MBCT for relapse prevention in the treatment of depression (Segal et al., 2001), mindfulness/acceptance-based treatments for generalized anxiety disorder (Roemer & Orsillo, 2002), DBT for borderline personality disorder (Linehan, 1993), and mindfulness-based therapy for obsessive-compulsive disorder (Schwartz, 1996), these results suggest that it would be fruitful to explore mindfulness-based interventions in various affective disorders, using an approach that maps potentially relevant underlying neurobiological mechanisms and pathways together with affective behavior change measures, taking advantage in the study design of the intrinsic adaptability of mindfulness-based approaches to different life circumstances and conditions.

A New Prostate Cancer Intervention Combining MBSR and Dietary Intervention

In addition to these studies, a recent uncontrolled pilot study (Saxe et al., 2001) combined and expanded MBSR training with a low-fat vegetarian dietary intervention to explore the effectiveness of this new 12-week intervention, which included spouses and significant others, in slowing, arresting, or reversing prostate-specific antigen (PSA) velocity in men with prostate cancer who had previously undergone prostatectomies and who subsequently proved to have rising PSA levels, indicating metastatic spread. In a series of 10 patients, we found that the rate of PSA increase decreased in 8 of the 10 patients, while 3 had a decrease in absolute PSA (signed rank test $p = .01$). Estimated median PSA doubling time increased from 6.5 months

before the intervention to 17.7 months after the intervention. This study demonstrates the potential feasibility and utility of using the cultivation of mindfulness within the context of MBSR to achieve behavior changes, such as dietary compliance, that are frequently difficult to attain and maintain with use of strictly behavioral motivators. In this case the mindfulness training and application was extended to include bringing mindfulness to shopping and food selection, cooking, and eating in ways that can enhance dietary adherence. This remains an area of ongoing investigation.

CONCLUSION

Baer's conceptual and empirical review of mindfulness-based interventions points toward the potential promise of further and increasingly methodologically rigorous studies of mindfulness-based clinical interventions. This commentary highlights and contextualizes some of the fundamental issues, opportunities, and challenges facing both clinicians and researchers alike, in the design, delivery, and evaluation of such a deceptively simple yet highly complex intervention approach and its effective integration, at the level of theory as well as treatment, with other therapies and practices in medicine and psychology. It necessarily glosses over or leaves undescribed the nature, spirit, and substance of the curriculum of mindfulness-based interventions; the inherent flexibility of the curriculum in terms of both content and delivery and yet its reliance on essential core meditative practices grounded in silence, stillness, self-inquiry, embodiment, emotional sensitivity, and acceptance of the full gamut of emotional expression held in awareness (all practices that shape and inform the intervention and its unfolding at every level); and, finally, its acknowledgment of the universal longing in people for happiness, well-being, resilience, and peace of mind, body, and soul, and how that longing might be effectively met, honored, and mobilized for transformation among program participants (Kabat-Zinn, 1990; Santorelli, 1999). This commentary has perforce also ignored the poetry of mindfulness, and the appropriate uses of the poetic imagination within mindfulness-based interventions.

NOTES

1. Following Baer, I will not discuss the social-psychological construct that Langer (1989) has termed "mindfulness," but focus on the traditional usage stemming from Buddhist meditation practices that have been adapted to one degree or another and

integrated within the mainstream of medicine over the past 20-plus years.

2. Note that while this perspective may seem commonsensical, if not axiomatic—just as surgeons who want to perform an unfamiliar complex procedure would first need to acquire, from those who developed it or their designees, first-person, hands-on experience through specialized postgraduate training before becoming competent in performing it—this proposition has not been subject to empirical testing in the case of mindfulness. Hayes (2002) has emphasized that methods involving acceptance and mindfulness must be separated from their religious and spiritual traditions so they can be conceptualized and studied from a scientific perspective and integrated into Western psychological understanding. Of course, any true integration of a new and fundamental element into psychology is likely to contribute to a broadening of the field itself and its perspective on alternative epistemologies, in this case those epistemologies lying at the interface of meditative experience itself, influenced in some measure by cultural and contextual considerations, and empirical science, as suggested by Walsh (1980). This area is one for fruitful research and deserving of rich debate and dialogue, which can only deepen the profession's ultimate understanding of what works, for whom, and why. I am merely delineating in this article the bare outlines of a perspective that my colleagues and I have developed from both our own firsthand experience of meditation practice and teaching, and our clinical experience with medical patients undergoing training in MBSR in the context of mainstream medicine and health care. Of course, it is important to point out that research has yet to probe systematically the relationship between specific outcomes of MBSR and the degree and depth (difficult to measure) of formal practices engaged in by participants, either in the classes themselves or between sessions, to achieve optimal clinical effects.

3. Further information on MBSR and its professional training opportunities, standards of practice, guidelines for providers, background bibliographies on mindfulness, and ongoing projects can be obtained by contacting the Center for Mindfulness in Medicine, Health Care, and Society at University of Massachusetts Memorial Medical Center, Shaw Building, Worcester, MA 01655-0267, or accessing the Web site: <http://www.umassmed.edu/cfm>. There are also training opportunities in MBCT. Information for these can be obtained by contacting Zindel Segal, Center for Addiction and Mental Health, Clarke Division, University of Toronto, Toronto, Ontario M5T 1R8, Canada, for training programs in North America; and John Teasdale, Medical Research Council, Cognition and Brain Sciences Unit, 15 Chaucer Road, Cambridge CB2 2EF, U.K., for training programs in Europe. For mindfulness meditation retreats in the Buddhist Theravada tradition (vipassana), see the Web site: <http://www.dharma.org>. The Center for Mindfulness requires that prospec-

tive interns have experienced at least one and preferably two teacher-led 10-day vipassana retreats (or an equivalent) before enrollment.

4. *Note added in proof:* The Center for Mindfulness in Medicine, Health Care, and Society has recently initiated a multistage credentialing process, teacher certification in MBSR. See www.umassmed.edu/cfm for details.

REFERENCES

- Baer, R.A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*, 125–143.
- Batchelor, S. (1994). *The awakening of the West: The encounter of Buddhism and Western culture*. Berkeley, CA: Parallel Press.
- Bernhard, J., Kristeller, J., & Kabat-Zinn, J. (1988). Effectiveness of relaxation and visualization techniques as an adjunct to phototherapy and photochemotherapy of psoriasis. *Journal of the American Academy of Dermatology, 19*, 572–573.
- Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction? *Psychosomatic Medicine, 64*, 71–84.
- Borkovec, T. D. (2002). Life in the future versus life in the present. *Clinical Psychology: Science and Practice, 9*, 76–80.
- Chomsky, N. (1965). *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Chuang Tsu (1964). *Chuang tsu: Basic writings* (B. Watson, Trans.). New York: Columbia University Press.
- Davidson, R. J. (1992). Emotion and affective style: Hemispheric substrates. *Psychological Science, 3*, 39–43.
- Davidson, R. J. (2000). Affective style, psychopathology and resilience: Brain mechanisms and plasticity. *American Psychologist, 55*, 1196–1214.
- Davidson, R. J., Ekman, P., Saron, C., Senulis, J., & Friesen, W. V. (1990). Approach/withdrawal and cerebral asymmetry: Emotional expression and brain physiology, I. *Journal of Personality and Social Psychology, 58*, 330–341.
- Davidson, R. J., & Irwin, W. (1999). The functional neuroanatomy of emotion and affective style. *Trends in Cognitive Science, 3*, 11–21.
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S., et al. (in press). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*.
- Davis, W. (1998). *Shadows in the sun: Travels to landscapes of spirit and desire*. Washington, DC: Island Press.
- Depraz, N., Varela, F. J., & Vermersch, P. (2000). The gesture of awareness: An account of its structural dynamics. In M. Velmans (Ed.), *Investigating Phenomenal Consciousness* (pp. 121–136). Amsterdam: Benjamin.
- Eliot, T. S. (1943). *Four quartets*, p. 39. New York: Harcourt Brace.

- Fields, R. (1992). *How the swans came to the lake: A narrative history of Buddhism in America*. Boston: Shambhala.
- Goldstein, J. (1987). *The experience of insight*. Boston: Shambhala.
- Goldstein, J. (2002). *One dharma: The emerging Western Buddhism*. San Francisco: HarperSanFrancisco.
- Goldstein, J., & Kornfield, J. (1987). *Seeking the heart of wisdom*. Boston: Shambhala.
- Goleman, D. (Ed.). (1997). *Healing emotions*. Boston: Shambhala.
- Goleman, D. (Ed.). (2003). *Destructive emotions: A scientific dialogue with the Dalai Lama*. New York: Bantam Books.
- Gunarantana, H. (1992). *Mindfulness in plain English*. Boston: Wisdom Publications.
- Hanh, T. N. (1999). *The heart of the Buddha's teaching*. New York: Broadway.
- Hayes, S. C. (2002). Acceptance, mindfulness, and science. *Clinical Psychology: Science and Practice*, 9, 101–106.
- Houshmond, Z., Harrington, A., Saron, C., & Davidson, R. J. (2002). Training the mind: First steps in a cross-cultural collaboration in neuroscientific research. In R. J. Davidson & A. Harrington (Eds.), *Visions of compassion: Western scientists and Tibetan Buddhists examine human nature* (pp. 3–17). New York: Oxford University Press.
- Jacobson, E. (1938). *Progressive relaxation*. Chicago: University of Chicago Press.
- Kabat-Zinn, J. (1982). An out-patient 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: Delacorte.
- Kabat-Zinn, J. (1993). Mindfulness meditation: Health benefits of an ancient Buddhist practice. In D. Goleman & J. Gurin (Eds.), *Mind/Body Medicine* (pp. 259–275). Yonkers, NY: Consumer Reports Books.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion.
- Kabat-Zinn, J. (2000). Participatory medicine. *Journal of the European Academy of Dermatology and Venereology*, 14, 239–240.
- Kabat-Zinn, J. (2003). Mindfulness: The heart of rehabilitation. In Leskowitz, E. (Ed.), *Complementary and alternative medicine in rehabilitation* (pp. xi–xv). Saint Louis: Churchill Livingstone.
- Kabat-Zinn, J., Chapman, A., & Salmon, P. (1997). The relationship of cognitive and somatic components of anxiety to patient preference for alternative relaxation techniques. *Mind/Body Medicine*, 2, 101–109.
- Kabat-Zinn, J., & Chapman-Waldrop, A. (1988). Compliance with an outpatient stress reduction program: Rates and predictors of completion. *Journal of Behavioral Medicine*, 11, 333–352.
- Kabat-Zinn, J., Lipworth, L., & 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., Lipworth, L., Burney, R., & Sellers, W. (1986). Four year follow-up of a meditation-based program for the self-regulation of chronic pain: Treatment outcomes and compliance. *Clinical Journal of Pain*, 2, 159–173.
- Kabat-Zinn, J., Massion, A. O., Kristeller, J., Peterson, L. G., Fletcher, K., Pbert, L., et al. (1992). Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry*, 149, 936–943.
- Kabat-Zinn, J., Wheeler, E., Light, T., Skillings, A., Scharf, M., Cropley, T. G., et al. (1998). Influence of a mindfulness-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemotherapy (PUVA). *Psychosomatic Medicine*, 60, 625–632.
- Krishnamurti, J. (1999). *This light in oneself: true meditation*. Boston: Shambhala.
- Langer, E. J. (1989). *Mindfulness*. Reading, MA: Addison Wesley.
- Lao-tsu (1988). *Tao te ching* (S. Mitchell, Trans.). New York: Harper Perennial.
- Linehan, M. M. (1993). *Cognitive behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- Maharaj, N. (1973). *I am that* (Vols. 1 and 2). Bombay: Chatana Pvt.
- Maharshi, R. (1959). *The collected works of ramana maharshi*. New York: Weiser.
- Miller, J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, 17, 192–200.
- Nanamoli, B., & Bodhi, B. (1995). *The middle length discourses of the Buddha: The majjhima nikaya*. Boston: Wisdom Publications.
- Relman, A., & Angell, M. (2002). Resolved: There is no good published evidence that psychosocial interventions can directly affect the outcome of organic diseases, or that psychosocial factors directly cause such diseases. *Psychosomatic Medicine*, 64, 558–563.
- Relman, A., Riley, D., Kabat-Zinn, J., & Hosmer, D. (2001). Parsing the data: An examination of a study on meditation and psoriasis. *Advances in Mind-Body Medicine*, 17, 66–77.
- Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice*, 9, 54–68.
- Rosenberg, L. (1998). *Breath by breath: The liberating practice of insight meditation*. Boston: Shambhala.

- Salmon, P., Santorelli, S. F., and Kabat-Zinn, J. (1998). Intervention elements promoting high adherence to mindfulness-based stress reduction programs in the clinical behavioral medicine setting. In S. A. Shumaker, E. B. Schron, J. K. Ockene, & W. L. McBee (Eds.), *Handbook of health behavior change* (2nd ed., pp. 239–266). New York: Springer.
- Santorelli, S. (1999). *Heal thy self: Lessons on mindfulness in medicine*. New York: Random House.
- Santorelli, S. (2001). Mindfulness-based stress reduction: Qualifications and recommended guidelines for providers. In J. Kabat-Zinn & S. Santorelli (Eds.), *Mindfulness-based stress reduction professional training manual*. Worcester, MA: Center for Mindfulness in Medicine, Health Care, and Society.
- Saxe, G. A., Hebert, J. R., Carmody, J. F., Kabat-Zinn, J., Rosenzweig, P. H., Jarzowski, D., et al. (2001). Can diet, in conjunction with stress reduction, affect the rate of increase in prostate-specific antigen after biochemical recurrence of prostate cancer? *Journal of Urology*, *166*, 2202–2207.
- Schwartz, J. M. (1996). *Brain lock*. New York: HarperCollins.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York: Guilford Press.
- Snyderman, R., and Weil, A. T. (2002). Integrative medicine: Bringing medicine back to its roots. *Archives of Internal Medicine*, *162*, 395–397.
- Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J., & Lau, M. (2000). Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting and Clinical Psychology*, *68*, 615–623.
- Thakar, V. (1972). *Mutation of mind*. Ahmedabad, India: New Order Books.
- Thera, N. (1962). *The heart of Buddhist meditation*. New York: Weiser.
- Tolle, E. (1999). *The power of now*. Navato, CA: New World Library.
- Varela, F. J., Thompson, E., & Roach, E. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.
- Walsh, R. (1977). Initial meditative experiences: I. *Journal of Transpersonal Psychology*, *9*, 151–192.
- Walsh, R. (1978). Initial meditative experiences: II. *Journal of Transpersonal Psychology*, *10*, 1–28.
- Walsh, R. (1980). The consciousness disciplines and the behavioral sciences: Questions of comparison and assessment. *American Journal of Psychiatry*, *137*, 663–673.
- Williams, R. B., & Schneiderman, N. (2002) Resolved: Psychosocial interventions can improve clinical outcomes in organic disease. *Psychosomatic Medicine*, *64*, 552–557.
- Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford, CA: Stanford University Press.
- Woolfolk, R. L., & Lehrer, P. M. (1984). Clinical stress reduction: An overview. In R. L. Woolfolk & P. M. Lehrer (Eds.), *Principles and practice of stress management* (pp. 5–6). New York: Guilford Press.
- Zajonc, A. (2000). Molding the self and the common cognitive sources of science and religion. In V. H. Kazanjian, Jr., & P. L. Laurence (Eds.), *Education as transformation: Religious pluralism, spirituality, & a new vision for higher education in America* (pp. 59–68). New York: Peter Lang.

Received May 17, 2002; revised September 27, 2002; accepted October 2, 2002.