Cognitive Error and Contemplative Practices

The Cultivation of Discernment in Mind and Heart

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Brains are amazing organs in all creatures with central nervous systems and especially in human beings. But they are not perfect. Without forgetting the larger success story of cognitive evolution, I want to explore the way that cognitive biases sometimes produce errors in both religious and secular social settings and how such errors can be diagnosed and corrected when they occur. This will involve noticing that error diagnosis and correction is a process that certain social groups have a vested interest in resisting or neglecting, in some respects, while the very same social groups may furnish resources that support the detection of cognitive errors, in other respects.

This presents a moral quandary for both secular and religious groups. Should we educate children to be fully aware of their cognitive vulnerability to advertising, thereby learning how to resist and eventually become immune to one of the fundamental power sources of modern market economies? Should religious groups explain to young people their cognitive tendencies to posit the action of supernatural beings whether or not any such action exists, even though this may disrupt the power of religious groups to forge bracing social togetherness that supports psychologically useful coping skills? While I do not seek to answer such complex moral questions in this paper, I do argue that knowledge of cognitive biases and the resulting tendencies to cognitive error, self-defeating behaviors, and self-deception should be made available to those individuals and groups who are interested in promoting a high degree of critical self-awareness in the analysis of beliefs and behaviors in both secular and religious contexts.

The term "error" is a potentially problematic one in that it misleadingly suggests that there might be a uniquely correct way in which cognition should work. I do not wish to suggest such a binary opposition. After all, biases exist in the human cognitive system either because they have been selected in the evolutionary process for their survival benefits or because they are side effects of other traits selected for their usefulness. My concern is with the wondrous human discovery that we can analyze

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our behaviors and beliefs with such precision that we can sometimes detect when our cognitive biases produce mistaken beliefs and self-defeating behaviors. This forms the basis for my contention that cognition can often work better than it does—more accurately, less self-destructively—when tendencies to cognitive error are diagnosed, corrected, and perhaps even systematically resisted.

The profound irony here is that the very same social groups (secular and religious) with an obvious vested interest in resisting such enlightenment in some respects can also promote processes of discernment and insight in other respects. Existing literature in the cognitive psychology of religion rarely bothers with such subtleties. It is common to assume that simply to notice the operation of cognitive biases in religion—say, in supporting belief in supernatural entities who providentially interact in human affairs, or in establishing and reinforcing people's willingness to defer to certain kinds of religious authority—is at the same time to establish the presence of rampant cognitive error, massive resistance to diagnosing and correcting it, and thus the infliction of pernicious cruelties on young children who have no way of escaping the resulting irrational indoctrination.

This moral reflex to condemn religious groups because of their characteristic reluctance to acknowledge the role of cognitive biases in their beliefs and practices is understandable given the irrationality, ignorance, or denial that such reluctance suggests. I frankly acknowledge that I share this moral concern. But the actual complexities of religious practice demonstrate that the situation demands a subtler evaluation. Resistance to awareness of cognitive biases exists both inside and outside religious groups; economic and political practices in all eras and of all types have every bit as much to gain from neglecting to enlighten people about their cognitive operations as religious groups do—just consider the techniques employed in commercial advertising and political campaigns. Moreover, religious groups also promote methods of discernment and self-awareness that have historically been, and continue to be, the dominant method by which ordinary religious people diagnose and resist at least some types of cognitive error—particularly those bearing on self-defeating behaviors and distorted perceptions of reality. As usual in life, as well as in the analysis of anything as complex and vibrant as religion, the case can and must be argued on both sides before drawing final conclusions. I shall not be drawing final conclusions here, as I have said, but I will endeavor to surface both sides of the case concerning the relationship between religion and cognitive error.[1]

SEVEN COGNITIVE ERRORS

Psychologists have analyzed, isolated, tested, and named dozens of cognitive and perceptual tendencies that predictably produce errors in certain well-understood contexts.[2] An efficient way into this world of commendable self-criticism is psychologist Thomas Gilovich's survey of the fallibility of human reason in everyday life.[3] This approach involves setting aside the many illusions and misjudgments and imperfections related to the brain's sensory and motor systems, focusing instead on memory, interpretation, and reasoning, which are the parts of human cognition most relevant

to personal religious beliefs and practices. Drawing on a host of psychological experiments in the preceding decades, Gilovich distinguishes between cognitive factors in producing erroneous beliefs, on the one hand, and motivational or social factors, on the other. He discusses three classes of each type, making six factors; to those I add a seventh factor derived from the core hypothesis of cognitive psychotherapy. I illustrate each here in relation to everyday life experiences and in relation to religious beliefs and behaviors. In each case, the point is that well-established cognitive tendencies regularly and predictably produce errors in belief and interpretation, that such vulnerabilities to error are amply present in religious settings, and thus that means of diagnosis and correction of such tendencies to error have a potentially vital role to play in religious settings. Whether techniques for diagnosis and correction are actually employed in religious settings is, of course, another question, to which the answer is yes and no, as I have suggested.

The first of the three cognitive factors is our tendency to produce meaningful patterns from purely random data.[4] This arises from a general capacity for pattern recognition in human beings that in many instances is tremendously useful and important for social life, inquiry, and survival. For example, social life crucially depends on facial recognition, our fondness for music requires an embodied sensitivity to rhythmic patterns, and much of advanced mathematics requires people with a prodigious talent for pattern recognition. The error in question arises when our native talent for pattern recognition leads us to misinterpret and sometimes even to misperceive random data. Any psychology undergraduate has seen and probably participated in the entertaining experiments that manifest the turning point at which this enormously useful cognitive tendency becomes a source of errors in interpretation. Statistical analysis of the shooting results of professional basketball players shows that belief in the "hot hand" that supposedly makes them hit baskets in streaks is just such an error—Gilovich seems to relish recounting the rocky reception of this scientifically robust research within the basketball fraternity.[5] Many aspects of a basketball player's game may measurably improve when he or she is in the wondrous flow state—being "in the groove"—but shooting accuracy is not one of them, on the whole, regardless of the player's feelings about the matter. In the religious context there is a virtually unlimited amount of data available for interpretation as meaningfully patterned, as when an apparent coincidence strikes us as highly religiously significant and evidence of the providential action of deities, ancestors, angels, demons, ghosts, or other discarnate entities. The data may well be random and we may well be experiencing an instance of this cognitive tendency producing cognitive error, but it is difficult to decide whether this is so. In fact, the ontology of religion is such that there is a significant scarcity of information capable of correcting mistaken religious beliefs. As a result, this kind of cognitive error, if it occurs in religious settings, is more difficult to detect and harder to eradicate from the religious domain than from many other domains of human cultural expression where resources for correction may be more readily accessible and analyzable.

The second cognitive factor is our tendency to infer a great deal from too little information.[6] Again, this is a useful aspect of our pattern recognition skills that

allows us to interpolate effortlessly and efficiently produce interpretative hypotheses that guide action plans. When this otherwise useful cognitive bias goes awry, however, we misinterpret incomplete and unrepresentative data. This problem is common in epidemiology, as when people pay more attention to instances of cell phone users getting brain cancer than to cell phone users not getting cancer, or when people feel certain that there is a link between autism and childhood inoculations without ever conducting statistical analyses on what is a prodigiously complex data set to which our personal experience gives us only an incomplete and possibly unrepresentative sample. Such questions remain unanswered until the research necessary to answer them is performed and replicated, but such answers do not convince everyone, such is the strength of this particular cognitive bias. In religious settings, groups and their leaders typically make available only information that is supportive of preferred religious beliefs and either suppress or make no effort to inform themselves about contraindicating evidence. For example, people notice and report on supposedly answered prayers but do not mention the host of unanswered prayers, or prayers allegedly answered in the form of divine permission of an unwanted tragic outcome. The resulting information sets are incomplete and unrepresentative, which makes more likely (without of course guaranteeing) the occurrence of a cognitive error in the corresponding beliefs about providence and the power and mechanisms of prayer. In respect of the virtues of transparency and full disclosure, unfortunately, religious leaders rarely acknowledge these limitations in data, hopefully because they themselves remain unaware of them rather than because of any deliberate intent to deceive. But this may not be all bad: to point out the human vulnerability to cognitive error in such cases would probably disrupt the sort of positive thinking and enthusiasm that appear to produce desirable physical and mental health outcomes, particularly for people grappling with a health challenge that might be emotionally crippling without supportive social and cognitive resources.

The third cognitive factor is our tendency to see what we expect to see.[7] The linkage between expectations and perceptions is necessary for making sense of the world and for navigating it smoothly without having to attend to every little detail of our environments. Imagine if we had to think about every little movement of our limbs and every potential obstacle in our path as we went walking! The obvious usefulness of our tendency to see what we expect to see can leave us ill prepared to detect the error that occurs when something unusual happens and our existing expectations distort our interpretation. When it occurs, this error often involves biased evaluation of ambiguous and inconsistent data, as when scientists interpret mixed data as supportive of their favored hypothesis and discount unfavorable data as aberrant. In religious settings, there is ample opportunity for this error to occur, though again actually detecting the error if and when it occurs is difficult because of the scarcity of convenient corrective resources. For example, religious people may attach an interpretation to a sacred story such as Noah's ark that conforms to expectations formed in their religious group about a loving God who saves people from disaster and protects helpless animals. This in-group interpretation makes it almost impossible for a group member to perceive the story as one of divine mass murder and arbitrary cruelty.

Does an error occur because of this blindness to unexpected outsider perspectives on familiar precious stories? Perhaps, but perhaps not, depending on the theological outlook and prevailing attitudes toward sacred texts and our obligations in interpreting them. In this case, for example, the possibility of discerning a vengeful deity is almost eliminated by the "saving God who is kind to helpless animals" reading of the Flood story; against the long run of biblical interpretation and theological reflection this elimination certainly seems to be a serious error. It may also be a serious error in respect of practical considerations such as appreciating how traumatizing this story might be to a young child who hears it for the first time (as it proved to be for one of my children when he was three years old). Religious groups and leaders sometimes do a good job of interrupting people's expectations so that they can see reality as it more truly is—certainly they endeavor to catch some instances of this error in a way that they rarely attempt to diagnose and correct errors of the first two types.

Fourth, and the first motivational or social factor, is our tendency to see what we want to see.[8] Note the difference between seeing what we *expect* to see, which is typically a matter of cognitive instinct, and seeing what we *want* to see, which is typically a matter of social-emotional needs. This cognitive tendency can produce errors when our desires seriously distort our interpretation of others and ourselves. For example, almost everyone believes he or she is more intelligent and less prejudiced than the average person—an obvious statistical impossibility. Religious groups and belief systems are particularly vulnerable to this error, as many critics of religion from Feuerbach to Marx and from Nietzsche to Freud have pointed out. This is fundamentally because religious messages encode promises (possibly valid promises) to meet some of our most vital existential and social needs. This predisposes us to see in religious groups and systems of religious beliefs what we most need to see. Is what religious people most need to see really there, or are they victims of need-driven self-delusion as the projection critiques allege? While this question is difficult to answer at the best of times, there is no question that the vulnerability of religious groups and religious believers to error is particularly strong at this point. Correspondingly, the question of the obligation of religious groups and leaders to be transparent about the possibility of error is particularly pointed, the resistance to this sort of self-awareness particularly pronounced, and the need for mechanisms to detect and correct cognitive delusions due to projection and wish fulfillment particularly urgent.

Fifth, and the second motivational or social factor, is our tendency to believe what we are told.[9] This cognitive tendency makes social life more exciting and reduces the felt obligation to investigate all stories personally—both valuable effects. But secondhand information also has biasing effects on interpretations. In everyday life, most people tend to believe entertaining gossip passed on by friends, regardless of its actual truth. We give our friends special authority to determine what we believe about the world, other people, and ourselves. While that saves energy and increases the richness of our interpretation of reality at low cost to us, it can also lead to serious errors of judgment and mistaken beliefs. Religious settings are ripe for such errors to occur, though as usual it is easier to note the probability of error than it is to demonstrate that an error actually occurs. The vulnerability to error derives particularly from the

fact that religious groups often exercise authority in service of potent forms of social control. Members of religious communities tend to believe what their religious leaders tell them, particularly in religious groups that esteem their leaders highly and embrace the role of centralized authority in their common life. In this way, religious groups are frequently able to maintain leadership-defined plausibility structures even in the face of considerable evidence to the contrary. The authority-laced social fabric of religious groups appears to depend to a significant degree on this tendency to believe what we are told, and the outcomes are not always positive.

Sixth, and the third motivational or social factor, is the tendency to imagine that others agree with us.[10] Another energy-saving device, this derives from a social instinct to fit in with a group. We imagine we fit in better if we can sustain the belief that others agree with us, whether or not it is the case. This tendency can also produce incorrect beliefs at times. For example, people who drink alcohol mistakenly assume that far more people also like to imbibe than actually do. In religious settings, the messages and practices of group life promise (and frequently deliver) not only individual benefits but also corporate belonging of a uniquely satisfying kind. The powerful experience of intimate belonging and acceptance makes religious people particularly vulnerable to the expectation—which surveys show tends to be dramatically mistaken—that their religious beliefs enjoy broad support from the group to which they belong. People rarely pause to check if this is really so, and the need to check is effectively obviated by religious leaders who define the putative common faith of a religious community through preaching and teaching. In fact, people routinely make private adjustments to official group beliefs. While a relatively less harmful tendency than the others discussed here, it does appear that religious groups are particularly vulnerable to capitalizing unintentionally on putative near unanimity of opinion and belief for consolidating group identity and the authority of group leaders.

Seventh, and finally, we are liable to cognitive errors in the form of self-defeating thought processes and behaviors that seem obviously stupid to ourselves and to others and yet are surprisingly difficult to change. This is a standard assumption of cognitive therapies. Unfortunately, the errors that result from the tendency to self-defeating thoughts and behaviors can bring tremendous suffering. Consider the woman who needs and wants comfort because she is panicky and afraid, yet pushes away every possible source of help. Or the man who drinks himself out of a job and family and eventually to death despite the fact that he loves his work and his family and at most levels wants to continue living. In both cases, ways of thinking and patterns of self-understanding are implicated in the most tangled and destructive way with emotional needs and powerful behavioral habits. In religious settings, unlike in the case of the other six tendencies to cognitive error, there is a wealth of resources for diagnosing and mitigating the effects of self-destructive beliefs and behaviors; this is one of the most impressive aspects of religious groups and one of the recurring reasons why people commit to involvement in them.

Why are these tendencies to cognitive error present in human beings? Errors 1, 2, and 3 are results of our innate talent for recognizing patterns and attaching meaning to them. These cognitive skills are apparently tuned within the evolutionary process

to be overactive, which is optimally functional for hunter-gatherer survival. We all know how this works from our own experience—if there is a rustling in the bushes it is better for me to notice it, impute a dangerous cause to it, and then to run away than it is to poke around in the bushes trying to decide whether the wind or a dangerous animal caused the rustling. This same degree of vigilant tuning can be counterproductive on occasion within many cultural settings, which is the point at which a useful cognitive tendency becomes a cognitive bias that produces errors in belief and self-defeating behaviors. As witch crazes and persecution of minorities—among a host of other human moral disasters—show, overactive pattern recognition, cause detection, and intention attribution skills give rise to mistaken beliefs, dangerous superstitions, and sometimes terribly violent, fear-driven behavior. Errors 4, 5, and 6, which are the three classes of motivational and social factors, derive ultimately from the social embodiment of human brains. Sociality is crucial for producing healthy brains that function optimally. The problem is that more intricate forms of social organization and subtler types of belief assessment manifest inferential liabilities hidden within the same cognitive functions that operate well enough for most ordinary purposes.

The evolutionary context for human cognitive abilities underlines the fact that pattern recognition skills and social embodiment of brains, along with all other cognitive abilities, have a wide range of applications. Their innate level of tuning may prove highly functional and advantageous for survival and world making in some social settings and yet practically and intellectually disadvantageous or even disastrous in other social settings. This spectrum of functional evaluations of human cognitive powers confutes any simple binary opposition between useful and useless, or between true and false. When cultural activities (such as empirical psychology) permit the careful analysis and relatively objective testing of cognitive functions, it is sometimes possible to detect the occurrence of cognitive mistakes, even when the functional usefulness of the corresponding cognitive operation persists. And when common sense is enhanced with psychological and medical criteria for mental, physical, and spiritual well-being, it is also possible to give nuanced and relatively objective analyses of the senses in which a cognitive operation is healthy and unhealthy. These judgments call on socially stabilized networks of norms bearing both on the truth of interpretations and on human well-being. Obviously, it is not always in our interests to expose those webs of normative resources to scrutiny, or even to become fully aware of their operations. It is partly in virtue of this natural resistance to self-awareness that we are sometimes powerfully motivated to neglect the possibility of cognitive errors and to resist naming and correcting them. Yet these judgments are also crucial in the human quest for physical, mental, and spiritual well-being, so in other respects we are strongly motivated to diagnose cognitive errors and identify ways of mitigating them.

FIVE RESOURCES FOR CHANGE

As we learn about our cognitive limitations, we can choose to become aware of them and subsequently to resist them through forging new habits that are strong enough to contend with the innate wiring, the functional tuning, and the social framing of

our cognitive systems. We may not so choose, however, and in fact few people elect to fight for a high degree of self-awareness across the full range of ways that we are prone to cognitive error, let alone volunteer for the arduous work required to forge new habits that overcome those liabilities. The fact that this kind of self-awareness can disrupt some aspects of otherwise smoothly functioning secular and religious groups is added disincentive to take on this sort of moral and intellectual project. Nevertheless, the possibility for pursuing the project exists if we want to embrace it. Perhaps it is awareness of personal moral and spiritual shortcomings that most consistently triggers a quest for transformation in most people, religious or not; there is greater incentive to fight for change in that domain.

Every type of personal change depends on a variety of methods for attaining self-awareness and a range of techniques for arresting unwanted habits and forging desired ones in their place. All of these techniques involve education and self-awareness to various degrees and most also involve deploying corporate wisdom in addition to individual self-discipline. The ensuing transformation is not a simple one. I have two reasons for discussing fundamental resources for change in this section. On the one hand, self-awareness about the likelihood of cognitive error is simply depressing and misleading if it is not accompanied by understanding of the prospects for recognizing and resisting our tendencies to err. On the other hand, noticing the detailed mechanisms of change even in a preliminary way is essential for evaluating secular and religions methods for promoting discernment, self-awareness, and character change, which is the task of the next section of this essay.

The first resource for change is neuroplasticity. This is a feature of brains whereby new neurons (neurogenesis) and dying neurons, changes in number and type of synapses (synaptogenesis), and changes in the biochemical capacities of synaptic receptors individually and jointly produce changes in functional capacities of the organism. Contrary to earlier neurological assumptions that many parts of the brain are anatomically and functionally immutable after the periods of development critical to their formation, the neuroplasticity thesis is that virtually every part of the brain remains mutable long after it is initially formed and functional, not merely the parts related to memory and learning. The evidence for the neuroplasticity thesis is extremely compelling, led by spectacular longitudinal studies of athletes and musicians.[11] It is one of the most important contemporary discoveries about human neurology—indeed, about human life—because it implies that the brain has a fundamental capacity for rewiring itself in response to environmental circumstances, training, and traumatic injury. All capacities for cognitive and behavioral transformation of both the short-term and long-term varieties appear to depend to various degrees on neuroplasticity.

A second resource for change is implementation intentions. The brain's executive control functions allow ideas, judgments, memory, and desires to impact action plans so that behavior rises above the merely instinctual and reactive to become creative and imaginative. This capacity in human beings is profoundly open to intervention through training, ritualized habit formation, and the deployment of action scripts. In particular, we can deploy behavior-specific implementation intentions to form new

habits. This involves stipulating a goal (such as being courteous to family members), imagining circumstances in which the goal is at risk of not being achieved (such as feeling stressed when overworked or grumpy after a midday nap), defining actions that we intend to take under those circumstances (such as reminding ourselves of our likelihood of being discourteous and our desire to show respect for our loved ones), and practicing the implementation intention until we consistently achieve the desired goal. Implementation intentions deployed in this way have been shown to be highly effective in avoiding risky behaviors, in overcoming addictions, in blocking unhealthy impulses, and in changing behavioral habits.[12]

A third resource for change is ritual. Socially reinforced rituals can also produce behavior change and character transformation, even when they do not involve specific implementation intentions of the sort just discussed. The explanation for this probably lies in at least two considerations. On the one hand, ritual repetition is intrinsically rewarding thanks to the fact that its neural realization appears centrally to involve the dopamine circuitry of the frontal lobes, which implicates pleasure centers.[13] On the other hand, repeated actions reinforce a way of thinking that subsequently more easily emerges into consciousness even under stress when more automatic behavior tends to take over.[14] Once a way of thinking—a worldview, a moral framework, and a suite of moral purposes—intrudes itself into a reflexive stream of behavior, we have an opportunity to evaluate our actions and arrest their trajectory if we so choose. Carefully crafted rituals lay down cognitive pathways that then appear within the flow of consciousness more consistently. This helps to decrease automatic behavior in problem areas while increasing awareness of behaviors and behavioral consequences, thereby creating opportunities to interpose interpretations and action plans deriving from those ritually established cognitive networks. Underneath the double role of ritual in both maintaining social order and transforming society—a classic tension in ritual studies—participation in specific forms of ritual programming can increase cognitive alertness and moral freedom and thereby both reinforce self-understandings and help to transform behavior.[15]

A fourth resource for change is unconscious processes. Some forms of change appear to be rooted beneath the level of conscious awareness altogether. In particularly aggressive quests for self-understanding, it is possible to expose automatic behavioral impulses and cognitive habits to awareness, analysis, and modification. This is not a reference to direct behavioral modification of the sort used in cognitive-behavioral therapies, which more properly falls under the category of implementation intentions, above. Rather, this refers to the kind of therapeutic process prized in the psychoanalytic tradition of psychotherapy, in some types of spiritual direction, and in some types of shamanistic intervention. The premise here is that cognitive and behavioral patterns are often set so early and deeply—sometimes by trauma but more often by ordinary habit formation—that they lie beyond the reach of memory and understanding, yet remain behaviorally intrusive. Some of these induce great unhappiness and resist every conscious effort at change. The techniques for indirectly exposing such reflexive ways of thinking and acting vary. Some involve the construction of interpretative narratives that are useful for gaining some reflective control over unwanted

behavior sequences—the historical accuracy of such narratives is secondary to their personal intelligibility and leverage potential so the leading criteria of their quality are pragmatically existential and transformative. Some involve the symbolic and often unconscious reenactment in a nontraumatic therapeutic context of the problematic structural dynamics, in the course of which unexpected responses may defuse the causal inevitability of the behavioral and cognitive reflexes and allow new possibilities for behavior and self-understanding to arise. Such therapeutic processes can effectively promote change without the client ever gaining a clear understanding of how the change occurs or why change previously seemed so impossible.[16]

A fifth resource for change is social inducements. As the behaviorist school of psychology has emphasized, inducements to attempt specific behavioral change, and also to tackle the wider context of character and personality change, help us overcome natural resistance associated with confronting aspects of ourselves that may be painful to contemplate. Escaping existential despair and self-loathing is a major inducement of a personal kind. Meeting the requirements of group belonging and social fluency is inducement of the social variety (as when appropriate behavior is rewarded and inappropriate behavior punished). Moreover, the last three mentioned techniques for behavioral and character change—implementation intentions, ritual forms, and unconscious processes—either require some degree of social connection or can be powerfully reinforced by an appropriate social group. For example, twelve-step programs crucially deploy group contexts to establish and consolidate implementation intentions, to cultivate healthy ritual reinforcement of cognitive and behavioral programming, and to help people find their way to new spaces of personal freedom even when they do not know how to get there by themselves. Social context is every bit as vital as neural plasticity for facilitating these techniques of behavioral and character change.

This litany of transformational possibilities may suggest that human character is mercurial and readily changes with the slightest effort. But experience indicates that this is not so. Change occurs most readily at the level of behaviors and beliefs that can be impacted by attentional shifts—shifts that allow us to expose otherwise automatic cognitive and behavioral sequencing to scrutiny and thereby to interpose more desirable alternative possibilities. By contrast, the kinds of change needed to overcome the cognitive errors that are all-important in religious beliefs and behaviors are extraordinarily difficult to achieve and require adept-level training. Moreover, fundamental personality change is exceptionally unusual in human beings. Character transformation is thus variously a readily available live possibility, an exceptionally hard-won life goal, and virtually impossible, depending on what type and degree of transformation we have in mind.[17]

THREE TECHNIQUES FOR MITIGATING COGNITIVE ERROR

What techniques work best to mitigate cognitive error? For transforming human behavior and character, both religious and secular techniques have proved useful for accessing and marshalling the natural resources for change just discussed. These include meditation and psychotherapeutic processes, and I address these first in what

follows. In relation to subtle forms of cognitive error, rigorous intellectual training seems most effective, in both religious and secular variations, and I come to that last. Throughout I am concerned to demonstrate the complexity of the ways that human groups—and I have religious groups in mind particularly—both furnish resources for dealing with the problem of cognitive error in some respects while simultaneously resisting the requisite self-awareness and corrective resources in other respects.

First, many branches of Buddhism emphasize mindfulness meditation—as *vipassanā* or in a variety of related forms. Overstated claims about the transformational efficacy of meditation have been criticized but the neurological and psychological evidence at this point is compelling. The most comprehensive survey of psychological research into putative changes due to meditation is Jean Kristeller's multidomain model of meditation effects.[18] Kristeller distinguishes six domains of effects: attentional/cognitive, physical, emotional, behavioral, self-relational/other-relational, and spiritual. She then distinguishes within each domain the kinds of changes that can be expected in the initial stages of meditation training, as well as in the intermediate and advanced stages. For example, in the behavioral domain, beginners can expect increases in impulse control and improved awareness of behavior patterns, while intermediate meditators can expect to enjoy increased ability to overcome bad habits, increased compassionate behavior, and decreased addictive behavior. Kristeller presents significant empirical evidence in support of her multidomain model, including a fairly comprehensive list of relevant research studies.[19]

The most spectacular, though not necessarily the most robust, neurological evidence for sustained long-term changes due to meditation is probably a research study by neurologist Richard Davidson. In response to a personal request by the Dalai Lama, Davidson's research group used EEG equipment to measure the electrical activity in the brains of eight Tibetan Buddhist monks with at least ten thousand hours of meditation practice and ten volunteer controls with a modest week of meditation training specifically for the purposes of the experiment. The widely reported result was that the adepts displayed distinctive and nontypical gamma-wave signaling before, during, and after meditation, while the novice controls displayed no change after meditation whether or not they experienced similar gamma-wave changes during meditation. This was hailed as important evidence for neuroplasticity in relation to high-level cognitive-behavioral features of human beings.[20] Critics were quick to point out that it may merely be evidence that some brains are better suited to intense meditation than others, and that the intricate selection processes of full-time meditators in Buddhist monastic settings inevitably locate the few people with the right neural gear for the job. The longitudinal studies of meditation needed to settle the question of whether meditation produces neurologically detectable changes in brain structure and function are only just now under way.

While meditation is typically the domain of religious traditions, secular forms of meditation practice do exist. Perhaps best known among these is Herbert Benson's reduction of pointedly religiously framed Transcendental Meditation to the simple and thoroughly secular technique of relaxation. The bodily response to this simplest form of relaxation meditation has been shown to have significant health

effects, particularly in relation to stress-related illnesses affecting the cardiovascular system.[21] Within religious traditions, meditation practices take an enormous variety of forms and enjoy a wide array of legitimating explanations. Some traditions stress meditation as a central aspect of corporate and individual spirituality. Others stress prayer as a relational encounter between a believer and a supernatural entity, but such acts of prayer can often involve elements of meditation such as focused attention, heightened concentration, and wide awareness. Under a host of descriptions, therefore, meditation and its varied effects on cognition, emotion, behavior, and stress have been central to religious practice of many kinds whereas to date secular versions of meditation have proved hard to motivate beyond the associated medical (physical and psychological) benefits.

Kristeller's survey and analysis demonstrates that traditions of meditation practice, with widely varying emphases, have a robust claim to confront our vulnerability to cognitive error in several domains. Most notably, some forms of meditation are well suited to confront error 7 by raising awareness about self-defeating modes of thought and increasing the willingness and ability to change the resulting behaviors. Other forms of meditation, when pursued to adept level, are well suited to the task of discerning oneself, one's relationships, and even the world as they are, beneath the distortions of social and motivation factors and behind the biases of the cognitive factors that predispose us to errors of perception, interpretation, and behavior (errors 1–6). Very few meditation experts reach the adept level necessary to benefit from the full wealth of resources for confronting our vulnerability to cognitive error. But even moderately seasoned meditators understand the point from their own experience: the focus of attention and broad awareness achieved in certain meditation states allows meditators to escape the grip of their self-delusions and distorted interpretations to some degree. It follows that religious traditions have been responsible for promoting one of the very few more or less timeless resources for confronting, diagnosing, and correcting cognitive error.

Second, religious and secular psychotherapeutic techniques are best suited for addressing the cognitive processes that produce self-defeating beliefs and self-destructive behaviors (error 7). Psychotherapeutic methods promise immediate benefits for everyday life to a wide range of people—benefits related to healthy emotional and social function, and even improved physical health, particularly through the reduction of unhealthy stress.[22] Fundamentally, it is enormously satisfying and intrinsically rewarding as well as socially advantageous to break self-defeating habits of mind, to rise above self-destructive behaviors, and to craft new ways of being that bring greater happiness, peace of mind, and social artfulness.

As with meditation, exaggerated claims on behalf of the efficacy of psychotherapies have been vigorously challenged. The valid criticisms are that psychotherapy lacks an integrative framework of interpretation that allows therapists to generate powerful consensus about which therapeutic techniques to apply to which problems; that there are high dropout rates (47 percent in the United States[23]); that dropout rates are much higher for minority, less educated, and low-income clients; that it is difficult to tell when success and failure have been achieved; and that it is difficult

to distinguish the healing effects of the passing of time from the healing effects of an extended therapeutic process. Nevertheless, the most careful and comprehensive research suggests that, despite these difficulties, a conditionally affirmative assessment of the value of psychotherapies is in order.[24]

At this point in Western cultures, and increasingly in other world cultures, there exist side-by-side extensive religious and secular traditions of psychotherapy. On the one side, religions are peppered with practices and techniques that fall under the descriptor "psychotherapeutic" broadly construed. For example, there is Scientology's auditing process (involving an interview in conjunction with "E-meter" biofeedback measurement of electrical resistance on the surface of the auditee's finger), more conventional pastoral counseling and Dharma studies, advanced forms of spiritual direction, and group training in spiritual practices. On the other side, secular psychotherapy achieved professional recognition during the twentieth century and now is a large tent filled with hundreds of therapeutic techniques. Academic psychologists, insurance companies, and professional therapists have subjected dozens of these techniques to formal outcome studies. Many "standard of care" therapeutic modalities are virtually indistinguishable in religious and secular settings, because the operative norms for mental and physical health and the training of caregivers are so similar. But there are also characteristic differences related mainly to the way spirituality and religiousness are handled: therapeutic relationships can be constructed with or without articulated goals for spiritual maturity as well as mental health, with or without norms for therapeutic success rooted in authoritative spiritual traditions and sacred texts, and with or without the resources and conceptual frameworks of particular religious traditions.

The five basic resources for cognitive and behavioral change—neuroplasticity, implementation intentions, ritual practices, unconscious processes, and social motivations and supports—are leveraged in a variety of ways within the host of psychotherapeutic processes. The resulting psychotherapeutic methods appear to range across essentially the same suite of possibilities in both religious and secular contexts. This is part of the reason that dialogues between religion and psychotherapy are so rich.[25] I suspect that the therapeutic relationship and the therapeutic technique determine the mechanisms of transformation more than the religious or secular context—certainly, this is how things appear to the religious naturalist who rejects the idea of supernatural divine beings that can supposedly change people in the blink of an eye. In all cases, therapeutic transformation is as difficult as it is rewarding. It involves painful moments of self-realization and repeated, multileveled failure to realize one's cognitive and behavioral goals. But it also involves ever deepening awareness of circumstances and one's responses to them, as well as the joy of breakthrough moments and increased freedom of thought and action in moments of stress. The drama and intensity of the therapeutic process is indicative of a fundamentally spiritual quest, whether or not patient or therapist thematizes spirituality.

Psychotherapeutic techniques, whether secular or religious, may be best for dealing with the tendency to error 7, but they also appear to be somewhat useful for confronting the social and motivational factors that expose us to cognitive errors 4–6. As self-awareness is enhanced in therapeutic processes, the ability to discern motivations and

interests is reinforced, which thereby promotes discrimination between our strongly motivated and inevitably narrow interpretations of events and the actual complexity of those events. To understand the factors that condition the way we read people and events is to give ourselves the beginnings of the freedom and insight necessary to interpret them differently, more richly and complexly. The change derives from a blend of implementation intentions, unconscious change, and social inducements. The impact of these changes on cognitive errors 4–6 may be small, but the same research that ascribes overall effectiveness to psychotherapeutic processes appears to entail that there should be some improvement in these social and motivational factors in cognitive error. Unfortunately, psychotherapies do not appear to be useful for confronting the cognitive factors that lead to errors 1–3.

Third, rigorous intellectual training is particularly useful for detecting and resisting all of the cognitive tendencies that produce mistaken beliefs, including errors 1–6. Effectively resisting such cognitive impulses is not the work of a mere few years of education in reading, writing, humanities, and sciences, however. It takes many years to ritualize the process of following evidence where it leads rather than where we want it or expect it to lead. Such educational achievements may be of no interest to some and out of reach financially or intellectually for others. But the possibility exists nonetheless that the error-prone aspects of our otherwise eminently functional and generally accurate cognitive instincts can be resisted, ameliorated, and eventually significantly overcome through disciplined education and training.

To the extent that religious groups and leaders do not acknowledge their vulnerability to cognitive error, whether or not actual errors occur—to the extent, that is, that religious groups and leaders do not avail themselves of available resources for diagnosing the potential for cognitive error and educating religious people about it—rigorous intellectual training can be and has been seen as the enemy of religion. The so-called New Atheists do not fail to stress this point, and there is good reason for this interpretation.[26] For example, a 2005 Pew survey reports that 42 percent of Americans believe that "life on earth has existed in its present form since the beginning of time" (this includes 70 percent of white evangelical Protestants). Moreover, a further 18 percent believe that evolution is guided by a divine being and not by natural selection. Thus, a staggering 60 percent of Americans possess what appear to be profoundly religiously motivated and sustained beliefs about nature and history that are directly challenged by rigorous intellectual education. Notice that the subtle synthetic views in which a *divine being works through natural selection* (classic theistic evolution) are excluded from this 60 percent, as are atheistic, naturalistic, and religiously indifferent interpretations of evolution; the 60 percent figure encompasses people with beliefs that directly contradict the most basic elements of evolutionary biology.

The fact that most of this 60 percent have had some science education and yet still hold these supernatural beliefs about Earth geology and biology indicates the extent to which religious social settings are capable of supporting scientifically erroneous beliefs. The errors in this case are understandable; they derive from failures of imagination in the face of biological complexity and evolutionary time spans, and believing what we want to believe in light of justified worries about what evolution,

if correct, portends for the moral intelligibility and existential relevance of a divine being. Correcting and resisting the cognitive impulses that yield such errors is evidently extremely difficult. It can take decades for exceptional minds to learn how to combine apparently competing worldviews into satisfying syntheses that relieve anxiety about the confrontation between evolution and, say, supernatural personal theism. The fact that only a few people undertake such arduous cognitive self-reconstruction is one of the reasons that education introduces a genuine hierarchy of expertise into a social system, from Plato's time up to today, whether recognized as such or not. It also injects a problematic tone of condescension and defensiveness into debate over social issues whereby some effectively claim with significant justification more objectivity and insight than others.

One of the most interesting features of rigorous intellectual training is how little impact correcting cognitive errors related to belief formation (errors 1–6) often has on cognitive errors related to self-defeating relational and personal beliefs and behaviors (error 7)—and vice versa. Even different disciplinary specializations produce new cognitive habits that ameliorate the effects of some cognitive errors more than others. For example, professional historians are enormously sensitive to errors associated with contextual specificity, such as anachronism and abstraction—a species of the "everyone thinks, behaves, and believes like I do" error—whereas natural scientists appear to have little advantage over the general population in overcoming this instinctive flaw in human cognitive operations. Meanwhile, good scientists develop impeccable suspicion of their overactive inbuilt pattern recognition and cause-detection skills—a variant of the "too much data underdetermines interpretations" error—which directly mitigates against superstitious beliefs in every domain of life, while humanities specialists typically are not trained in this way and do not have the same sensitivities. I suspect that this is one of the fundamental reasons why belief in a supernatural divine being is so rare among premier scientists in the United States, as measured by membership in the National Academy of Sciences (7 percent)—much lower than among US scientists generally (39 percent) and enormously lower than in the general US population (more than 90 percent).[27]

Another fascinating feature of the cognitive effects of disciplined education and training is that, in some forms, it produces cognitive fruits in relation to errors 1–6 that are quite similar to some that flourish in advanced meditation practice. For example, Edmund Husserl believed that phenomenologists, with prodigious effort and focused training, could penetrate a variety of cognitive and perceptual processes in order to make objective observations without falling prey to the sorts of cognitive errors that routinely produce mistaken beliefs about the structure of consciousness and distorted interpretations of the surrounding world. The two best known techniques for achieving such mastery are bracketing, which involves deliberately not taking account of some features of an object of consciousness (say, ordinary assumptions about its ontological status or social function) in order to interpret other features in their own terms (say, its qualitative characteristics and contextual importance); and variation of parameters, which involves imaginatively changing conditioning factors in an effort to detect the most salient underlying causal structures and dynamic features of a phenomenon.[28] The

phenomenological tradition flowing from Husserl has substantiated these claims to a significant extent. Much the same kinds of claims are made by and about advanced meditation practitioners.[29] It is these features of meditation practices that underlie the wealth of phenomenological observations about states of consciousness in South Asian philosophical traditions, both Hindu and Buddhist, and also in Tibetan and Zen Buddhist literature. There are differences: phenomenological training focuses on describing internal states of consciousness and the surrounding world, whereas advanced meditation insight seems most useful for understanding internal states of consciousness and interpersonal dynamics. But the similarities are impressive.

As a more concrete example of this, consider Robert Forman's claim that states of so-called "pure consciousness" permit adepts to discriminate the contribution made to experience by our operative conceptual frameworks and social contexts.[30] Forman argues that this skill enables mystics from all traditions to agree on the ineffable nature of the logical object of mystical experience, regardless of the cultural, historical, religious, doctrinal, or devotional contexts of the mystics themselves. Forman deploys this argument against contextualists who argue on essentially Kantian grounds that it is impossible to tease apart the intrinsic content of mystical experiences from their various conditioning factors.[31] Which side is finally correct in this debate remains to be seen, if the debate is in fact tractable. But in attempting to resolve the issue, it is important to contend with the fact that advanced states of concentrated attention permit the discrimination of extremely fine features of cognitive, perceptual, emotional, and memory processing—with far more depth and precision of insight than would be thought possible by a person familiar with only the usual range of states of consciousness, no matter how well educated and highly trained they may be in other respects.

We have important evidence here, therefore, that both religious and secular techniques exist that are capable in principle of confronting most and perhaps all of the cognitive errors 1–6, just as we saw earlier that there are both religious and secular techniques that address cognitive error 7. Yet the differences matter a great deal. Secular forms of education are far more effective than secular or religious therapeutic techniques in addressing all of errors 1–6. Moreover, even if advanced meditation practice is year for year just as effective as secular forms of education in addressing these six errors, education is far more widely available, imposes far fewer special requirements on those who pursue it, and remains far more directly relevant to ameliorating the sometimes erroneous effects of our cognitive abilities. This defines the sense in which the rise of awareness about tendencies to cognitive error of the first six types is a notable and commendable achievement of secular cultures, often battling against significant resistance from religious groups, and it has massively outstripped the ancient and limited achievements of religious practices in relation to these six cognitive errors. In relation to the seventh error, pertaining to self-defeating beliefs and behaviors, the story is quite different. Religious means of confronting such tendencies to cognitive error are more widely accessible than secular therapeutic techniques and, roughly speaking, apparently no less effective. These conclusions indicate the sense in which the story about religion and cognitive error is a complex and fascinating one.

CONCLUSION

For all of the ways we are right to stand in awe of human cognitive powers, they are quite imperfect. This is not surprising, given the evolutionary circumstances to which human cognition is so marvelously adapted. But our cognitive deficits have always caused great personal suffering through self-defeating ways of thinking and self-destructive behaviors. In the last two-and-a-half thousand years, and more intensively than ever in the last half century, our subtly adjusted socially grounded ways of evaluating beliefs have shown that cognitive biases can also produce mistaken beliefs—predictably, routinely, and across our species. Evolution will not solve this problem for us, at least not in the short term—and perhaps not at all, given the difficulty of exposing subtle cognitive processes to selection pressures capable of changing our species' genetic-cognitive fortunes. To fix this problem, short of genetic engineering—and where would we begin with that?—we will have to deploy our most creative and rigorous forms of social organization to establish relevant rituals, implementation intentions, training practices, and therapeutic processes. Fortunately, the message of neuroplasticity is that some degree of change is possible with respect to overcoming both the instinctive formation of mistaken beliefs and incessantly self-defeating modes of thoughts and behavior.

Given that a lifetime of disciplined training seems necessary to achieve internal resistance sufficient to contend with our cognitive liabilities, what can we reasonably expect at the personal and cultural levels from all this effort? For one thing, we should expect that people would inevitably specialize in one or a few types of cognitive reprogramming, rather than all of them simultaneously. Expert historians immune to cognitive liabilities of the "people in other eras must think as we do" sort may still mistakenly expect a coin almost certainly to come up tails when told it has already come up heads fifty times in a row. Mathematicians who would never make common mistakes in probability may find themselves deeply superstitious because it was never in their professional interest to tame instinctively overactive pattern recognition skills. The highly trained physicist who would never make mistakes in the domain of pattern recognition and thus would never fall prey to superstition may nonetheless be thoroughly ensnared in cycles of self-defeating beliefs and behaviors that make everyone miserable and cause terrible suffering. And the monk who is deliciously free from attachment and the suffering it brings—on the very edge of enlightenment—may still be utterly unable to avoid biased interpretation of incomplete data about Earth's evolutionary and geological history. We do well to spread the word about cognitive error, especially if it prevents people expert in one type of reprogramming from arrogantly supposing that they are thereby immune to cognitive error in every sense.

Spreading the word in this way—regardless of its salutary effects for individual happiness and social understanding—will not delight some representatives of religions. It is in religious groups, after all, that cognitive errors such as superstition and biased appraisal of incomplete evidence find a sanctified home, where they are sometimes set apart from criticism and presented as the height of wisdom. And it is

in religious contexts that resources for the diagnosis and correction of tendencies to cognitive error are routinely neglected and the full story about human cognitive processes is routinely suppressed. Yet is it also religious traditions that furnish the most widely accessible techniques for personal transformation in relation to self-defeating beliefs and behaviors (error 7). Religion is such an enigma!

From my point of view, the way forward is, first, to recognize that religious groups, as well as economic and political practices, do have vested interests in neglecting resources for diagnosing and correcting tendencies to cognitive error. This suggests that there may be little large-scale change in the human cognitive profile for the foreseeable future. Yet, second, there are always individuals and some groups who seek transparency in social practices and greater consistency between those practices and the realities of human cognitive biases. Those people should have uncomplicated access to all of the information and techniques relevant to achieving their intellectual and transformational goals. Third, therefore, people in a position to assist those who seek help in handling the effects of cognitive bias should speak plainly about it, battling instinctive tendencies toward cognitive error on as many fronts as possible, and fostering as many techniques of diagnosis and correction as are available. This means diverse and disciplined education. It means meditation. It means suitable therapeutic processes.

After that, we must let the chips fall where they may with regard to religious beliefs and practices. Perhaps we come to see some of those beliefs as superstitious. Perhaps we conclude that those beliefs are the height of wisdom despite the constant threat of undiagnosed cognitive error. More likely we will find wisdom hovering within and behind the superstitions and errors. Wisdom lives on despite the abuse it suffers at the hands of cognitively careless mortals whose particular form of idolatry is to make ultimate reality conform to their undiagnosed tendencies to cognitive self-delusion. For those who learn to see wisdom there present in the midst of cognitive confusion, however, there is great and simple joy as the world untangles and wisdom shines through clearly. That makes the work of transformation worth the effort.

NOTES

1. For a fuller discussion of these issues, see Wesley J. Wildman, *Science and Religious Anthropology: A Spiritually Evocative Naturalist Interpretation of Human Life* (Aldershot, UK: Ashgate, 2009), chap. 5.

2. Any introductory textbook in cognitive psychology works through this material. For example, see Jonathan Baron, *Thinking and Deciding*, 4th ed. (Cambridge: Cambridge University Press, 2006).

3. See Thomas Gilovich, *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life* (New York: Free Press, 1991). For similar presentations, see Massimo Piatelli-Palmarini, *Inevitable Illusions: How Mistakes of Reason Rule Our Minds* (New York: John Wiley and Sons, 1996) and Scott Plous, *The Psychology of Judgment and Decision Making* (New York: McGraw-Hill, 1993).

4. See Gilovich, *How We Know What Isn't So*, 9–28.

5. See ibid., 11–17.

6. See ibid., 29–48.

7. See ibid., 49–72.

8. See ibid., 75–87.

9. See ibid., 88–111.

10. See ibid., 112–122.

11. The journal *Neural Plasticity* contains a wealth of information on the topic of its title. Also see the accessible surveys in Sharon Begley, *Train Your Mind, Change Your Brain: How a New Science Reveals Our Extraordinary Potential to Transform Ourselves* (New York: Ballantine Books, 2007); Norman Doidge, *The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science* (New York: Viking Adult, 2007); Joseph LeDoux, *Synaptic Self: How Our Brains Become Who We Are* (New York: Viking Adult, 2002); and Jeffrey M. Schwartz and Sharon Begley, *The Mind and the Brain: Neuroplasticity and the Power of Mental Force* (New York: Harper, 2002).

12. Implementation intentions have been used and shown to be effective in a wide variety of research studies. See C. J. Armitage, "Evidence That Implementation Intentions Reduce Dietary Fat Intake: A Randomized Trial," *Health Psychology* 23 (2004): 319–323; C. J. Armitage, "Evidence That Implementation Intentions Promote Transitions between the Stages of Change," *Journal of Consulting and Clinical Psychology* 74 (2006): 141–151; A. L. Cohen and P. M. Gollwitzer, "The Cost of Remembering to Remember: Cognitive Load and Implementation Intentions Influence Ongoing Task Performance," in M. Kliegel, M. McDaniel, and G. Einstein, eds., *Prospective Memory: Cognitive, Neuroscience, Developmental, and Applied Perspectives* (Mahwah, NJ: Erlbaum, 2007), 367–390; M. Galanter, "Spirituality and Addiction: A Research and Clinical Perspective," *American Journal on Addictions* 15 (2006): 286–292; P. M. Gollwitzer, "Goal Achievement: The role of Intentions," *European Review of Social Psychology* 4 (1993): 141–185; P. M. Gollwitzer, "Implementation Intentions: Strong Effects of Simple Plans," *American Psychologist* 54 (1999): 493–503; P. M. Gollwitzer and G. B. Moskowitz, "Goal Effects on Action and Cognition," in E. T. Higgins and A. W. Kruglanski, eds., *Social Psychology: Handbook of Basic Principles* (New York: Guilford Press, 1996), 361–399; P. M. Gollwitzer and B. Schaal, "Metacognition in Action: The Importance of Implementation Intentions," *Personality and Social Psychology Review* 2 (1998): 124–236; S. Orbell, S. Hodgkins, and P. Sheeran, "Implementation Intentions and the Theory of Planned Behavior," *Personality and Social Psychology Bulletin* 23 (1997): 945–954; S. Orbell and P. Sheeran, "Motivational and Volitional Processes in Action Initiation: A Field Study of the Role of Implementation Intentions," *Journal of Applied Social Psychology* 30 (2000): 780–797; A. Prestwich, R. Lawton, and M. Conner, "The Use of Implementation Intentions and the Decision Balance Sheet in Promoting Exercise Behavior," *Psychology and Health* 18 (2003): 707–721; P. Sheeran, "Intention-Behavior Relations: A Conceptual and Empirical Review," *European Review of Social Psychology* 12 (2002): 1–36; P. Sheeran and S. Orbell, "Implementation Intentions and Repeated Behaviour: Augmenting the Predictive Validity of the Theory of Planned Behavior," *European Journal of Social Psychology* 29 (1999): 329–369; P. Sheeran and S. Orbell, "Using Implementation Intentions to Increase Attendance for Cervical Cancer Screening," *Health Psychology* 19 (2000): 283–289; P. Sheeran and M. Silverman, "Evaluation of Three Interventions to Promote Workplace Health and Safety: Evidence for the Utility of Implementation Intentions," *Social Science and Medicine* 56 (2003): 2153–2163; P. Sheeran, T. L. Webb, and P. M. Gollwitzer, "The Interplay between Goal Intentions and Implementation Intentions," *Personality and Social Psychology Bulletin* 31 (2005): 87–98; and B. Verplanken and S. Faes, "Good Intentions, Bad Habits, and Effects of Forming Implementation Intentions on Healthy Eating," *European Journal of Social Psychology* 29 (1999): 591–604.

13. See Patrick McNamara, "The Frontal Lobes, Social Intelligence, and Religious Worship," in *Ideas for Creative Research in Neurobiology* (Philadelphia: John Templeton Foundation, 2002), 50–59. For a related but neurologically slightly different account, see Andrew Newberg, Eugene d'Aquili, and Vince Rause, *Why God Won't Go Away: Brain Science and the Biology of Belief* (New York: Ballantine Books, 2001).

14. See David Hogue, *Remembering the Future, Imagining the Past: Story, Ritual, and the Human Brain* (Cleveland: Pilgrim Press, 2003).

15. On ritual as a means for maintaining social order, a classic source is Émile Durkheim, *The Elementary Forms of the Religious Life: A Study in Religious Sociology*, trans. Joseph Ward Swain (London: G. Allen and Unwin; New York: Macmillan, 1915). For ritual as a means for social transformation, a classic reference is Victor W. Turner, *The Ritual Process: Structure and Anti-Structure* (Berlin: Walter De Gruyter, 1969).

16. As a sampling of the varied analyses of how this is possible, see the Jungian approach of Polly Young-Eisendrat, *Subject to Change: Analytical Psychology, Psychoanalysis, and Subjectivity* (New York: Routledge, 2004) and the shamanistic approach of Donald Sandner, *The Sacred Heritage: The Influence of Shamanism on Analytical Psychology* (New York: Routledge, 1996).

17. On the relative likelihood of various kinds of change, see Todd F. Heatherton and Joel L. Weinberger, eds., *Can Personality Change?* (Washington, DC: American Psychological Association, 1994).

18. See Jean Kristeller, "Mindfulness Meditation," in P. Lehrer, R. L. Woolfolk, and W. E. Sime, ed., *Principles and Practice of Stress Management*, 3rd ed. (New York: Guilford Press, 2007), 393–427.

19. In addition to the evidence Kristeller adduces in "Mindfulness Meditation," see the neurological studies of Antoine Lutz, Lawrence L. Greischar, Nancy B. Rawlings, Matthieu Ricard, and Richard J. Davidson, "Long-Term Meditators Self-Induce High-Amplitude Gamma Synchrony during Mental Practice," *Proceedings of the National Academy of Sciences* 101, no. 46 (2004): 16,369–16,373; and the discussions in Begley, *Train Your Mind, Change Your Brain*; B. Alan Wallace, *Contemplative Science: Where Buddhism and Neuroscience Converge* (New York: Columbia University Press, 2007); Herbert Benson, *The Relaxation Response* (New York: Morrow, 1975); and Herbert Benson, *Timeless Healing: The Power and Biology of Belief* (New York: Scribner, 1996).

20. See the report in Lutz et al., "Long-Term Mediators." Also see Begley, *Train Your Mind, Change Your Brain*, and Wallace, *Contemplative Science*.

21. See Herbert Benson, *The Relaxation Response* and *Timeless Healing*.

22. See the journals *Psychotherapy Research* and *Psychotherapy Theory, Research, Practice, Training* for an array of empirical research studies on the effectiveness of psychotherapy. Also see the surveys in John C. Norcross, Larry E. Beutler, and Ronald F. Levant, ed., *Evidence-Based Practices in Mental Health: Debate and Dialogue on the Fundamental Questions* (Washington, DC: American Psychological Association, 2005); Anthony Roth and Peter Fonagy, *What Works for Whom? A Critical Review of Psychotherapy Research*, 2nd ed. (New York: Guildford Press, 2004); Bruce E. Wampold, *The Great Psychotherapy Debate: Models, Methods, and Findings*, 2nd ed. (Mahwah, NJ: Lawrence Erlbaum Associates, 2008).

23. The 47 percent figure derives from Michael Wierzbicki and Gene Pekarik, "A Meta-Analysis of Psychotherapy Dropout," *Professional Psychology: Research and Practice* 24, no. 2 (1993): 190–195.

24. Again, this is the conclusion of a careful review in Wampold, *The Great Psychotherapy Debate*.

25. For standard works in Buddhism and psychotherapy, see M. Epstein, *Thoughts without a Thinker* (New York: Basic Books, 1995); M. Epstein, *Open to Desire, Embracing a Lust for Life* (New York: Gotham Books, 2005); E. Fromm and D. T. Suzuki, *Psychoanalysis and Zen Buddhism* (London: Unwin Paperbacks, 1986); Anthony Molino, *The Couch and the Tree: Dialogues in Psychoanalysis and Buddhism* (London: Constable, 1999); D. J. Meckel and R. L. Moore, ed., *Self and Liberation: The Jung/Buddhism Dialogue* (New York: Paulist Press, 1992); J. D. Safran, ed., *Psychoanalysis and Buddhism: An Unfolding Dialogue* (Somerville, MA: Wisdom, 2003); and N. Wellings and E. W. McCormick, *Nothing to Lose: Psychotherapy, Buddhism and Living Life* (New York: Continuum, 2005). Standard works in Christianity and psychotherapy include M. Alter, *Resurrection Psychology: An Understanding of Human Personality Based on the Life and Teachings of Jesus* (Chicago: Loyola University Press, 1994); D. Capps, *Life Cycle Theory and Pastoral Care* (Philadelphia: Fortress Press, 1983); T. E. Clarke, SJ, "Jungian Types and Forms

of Prayer," in R. L. Moore, ed., *Carl Jung and Christian Spirituality* (New York: Paulist, 1988): 230–249; H. Clinebell, *Basic Types of Pastoral Care and Counseling: Resources for the Ministry of Healing and Growth*, rev. ed. (Nashville: Abingdon, 1984); J. W. Fowler, *Stages of Faith: The Psychology of Human Development and the Quest for Meaning* (San Francisco: Harper San Francisco, 1981); E. W. Kelly Jr., *Spirituality and Religion in Counseling and Psychotherapy* (Alexandria, VA: American Counseling Association, 1995); M. T. Kelsey, *Christo-Psychology* (New York: Crossroad, 1982); J. McDargh, *Psychoanalytic Object Relations Theory and the Study of Religion: On Faith and the Imaging of God* (Lanham, MD: University Press of America, 1983); C. R. Schlauch, *Faithful Companioning: How Pastoral Counseling Heals* (Minneapolis: Fortress Press, 1995); and E. E. Whitehead and J. D. Whitehead, *Christian Life Patterns: The Psychological Challenges and Religious Invitations of Adult Life* (New York: Crossroad, 1992).

26. See Richard Dawkins, *The God Delusion* (Boston and New York: Houghton Mifflin Company, 2007); Daniel C. Dennett, *Breaking the Spell: Religion as a Natural Phenomenon* (New York: Viking, 2006); Sam Harris, *Letter to a Christian Nation* (New York: Knopf, 2007); Christopher Hitchens, *God Is Not Great: How Religion Poisons Everything* (New York: Twelve Books, 2007).

27. See Edward J. Larson and Larry Witham, "Scientists Are Still Keeping the Faith," *Nature* 386 (1997): 435–436; Edward J. Larson and Larry Witham, "Leading Scientists Still Reject God," *Nature* 394 (1998): 313.

28. For an overview of Husserl's phenomenological method and the associated techniques, see Edmund Husserl, *Ideas: General Introduction to Pure Phenomenology, Library of Philosophy*, trans. W. R. Boyce Gibson (London: George Allen and Unwin; New York: Macmillan, 1931).

29. For example, see Dharm P. S. Bhawuk, "Anchoring Cognition, Emotion and Behavior in Desire: A Model from the Bhagavad-Gita," in K. Ramakrishna Rao, Anand C. Paranjpe, and Ajit K. Dala, eds., *Handbook of Indian Psychology* (Cambridge University Press India, 2008), 390–413; R. F. Bornstein and J. M. Masling, eds., *Empirical Perspectives on the Psychoanalytic Unconscious* (Washington DC: American Psychological Association Press, 1990); Kristeller, "Mindfulness Meditation"; Joel W. Krueger, William James and Kitaro Nishida on *'Pure Experience,' Consciousness, and Moral Psychology*, PhD dissertation (Purdue University, 2008); K. Ramakrishna Rao and Anand C. Paranjpe, "Yoga Psychology: Theory and Application," in Rao and Paranjpe, *Handbook of Indian Psychology*, 186–216; L. Rinbochay and E. Napper, *Mind in Tibetan Buddhism* (Ithaca, NY: Snow Lion Publications, 1986); J. L. Singer and G. A. Bonanno, "Personality and Private Experience: Individual Variations in Consciousness and in Attention to Subjective Phenmoena," in L. Pervin, ed., *Handbook of Personality* (New York: Guildford Press, 1990), 419–444; Frederick Travis and Craig Pearson, "Pure Consciousness: Distinct Phenomenological and Physiological Correlates of 'Consciousness Itself,'" *International Journal of Neuroscience* 100, nos. 1–4 (January–February, 2000): 77–89; and Henry M. Vyner, "The Dialectal Phenomena and Processes of the Mind," *Imagination, Cognition and Personality* 27, no. 2 (2007): 163–196.

30. This is the centerpiece of Robert K. C. Forman, *Mysticism, Mind, Consciousness* (Albany: State University of New York Press, 1999).

31. Classic works defending the contextualist line are Steven T. Katz, ed., *Mysticism and Philosophical Analysis* (Oxford: Oxford University Press, 1978); Wayne Proudfoot, *Religious Experience* (Berkeley: University of California Press, 1985); and Matthew C. Bagger, *Religious Experience, Justification, and History* (Cambridge: Cambridge University Press, 1999).