Cognitive Theories of Ritual and Buddhist Practice: An Examination of Ilkka Pyysiäinen's Theory

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WHILE WE ARE HERE CONCERNED with the cognitive theory of ritual put forward by Ilkka Pyysiäinen, it is important to note at the start that Pyysiäinen's project is much more ambitious. It is nothing less than a cognitive theory of religion as a whole. As a consequence, it will be necessary to contextualize his treatment of ritual in terms of the theoretical bases of his larger project.

THE "COUNTER-INTUITIVE": BASIS OF PYYSIÄINEN'S THEORY

Pyysiäinen's general theory of religion works with a notion of the counter-intuitive as the necessary—though not sufficient—marker of religious beliefs:

> Religious representations, considered in isolation, are not a unique type of mental representation, and 'religion' does not refer to objects with distinctive causal properties. It is a more or less arbitrary process whereby certain counter-intuitive representations become selected for a use such that they are regarded as instances of religion.[1]

Pyysiäinen's approach to understanding religion in terms of the counter-intuitive contrasts with approaches frequently found in anthropology and religious studies, which employ such categories as "the supernatural" or "the superhuman." However, these categories in turn depend upon what is understood as "natural" and "human," categories which are not stable across cultures, or even in different contexts within the same culture.[2] Consequently, what might be considered "natural" or "human" varies so

greatly across religious cultures that no universally applicable under-
standing of religion can be developed from these categories. For these
reasons Pyysiäinen argues that the categories of "the supernatural" or "the
superhuman" are inadequate for application across different religious
traditions.

However, there are universal standards of intuitive reasoning based
on what are known as "intuitive" or "natural ontologies." These are
categories of existence which appear to be universally shared by all
humans, but which are not fixed—they change and develop over time.[3]
Intuitive ontologies are most clearly revealed in developmental studies of
children's cognition. Pascal Boyer has developed the research on intuitive
ontologies as an approach to cognitive theories of religion, and is one of the
primary sources for Pyysiäinen. Boyer explains that,

> Children, whose vocabulary does not include abstract terms like
> "event," "property," and "living kind," nevertheless make clear
> distinctions between these ontological categories. The ontological
> "tree" is of course gradually developed, mainly by subdividing
> categories that originally merge two or more adult categories.[4]

In relation to religion Boyer makes the point that "Religious representa-
tions typically center on claims that violate commonsense expectations
concerning ordinary things, beings and processes."[5] Boyer further speci-
fies that such religious claims range over four different "repertoires":
representations concerning ontological categories, causal relations, ac-
tions or episodes, and social categories.[6] These repertoires are inter-
related: for example, a deceased ancestor (ontological) may when angry
cause disease (causal) to his or her descendants (social), requiring a
sacrificial offering (event). Out of these four repertoires Boyer focuses on
the ontological, and is followed in this by Pyysiäinen. To establish the
intuitive or natural character of ontological representations, Boyer cites the
work of Frank C. Keil.[7] In his experimentation with children—who are not
able to explicitly express abstract, general categories—Keil found that they
still worked with "implicit ontological categories, for example, EVENT,
OBJECT, LIVING THING, ANIMATE, HUMAN, and so forth, which are
(1) organized in a hierarchy and (2) made manifest by predicate selection."[8]
The hierarchical nature of concepts refers to the way in which there are
more general categories which subsume more specific ones: oranges are
members of the category fruit. That these implicit ontological categories
are made manifest in predicate selection means that children will attribute
thought to humans, while they will not do so to objects.

With this background Pyysiäinen uses the term "counter-intuitive"
with a very specific meaning: "'Counter-intuitive' means 'violating
panhuman intuitive expectations' in a well defined fashion."[9] While the

kinds of "natural" or "intuitive" categories established by Keil's research grounds the notion of the counter-intuitive, Pyyiäinen cites Boyer for two specific ways in which counter-intuitive ideas are created: transference of qualities appropriate to one category to another where those qualities are not appropriate, and violation of the boundaries of an intuitive category:

> It is important to bear in mind that counter-intuitiveness consists precisely of violations against or tranferences across the boundaries between ontological categories. "Counter-intuitive" is not by definition the same as "false," "ridiculous," or "odd." Counter-intuitiveness also contradicts *intutive* expectations; it is therefore possible that a believer finds some familiar counter-intuitive representations as being quite natural, because this judgement is made at the level of *explicit* knowledge.[10]

This notion of the counter-intuitive is strengthened as a definition for religion by recent research that has demonstrated the fact that counter-intuitive ideas are more memorable than intuitive ones: "optimally counter-intuitive ideas are better recalled than ordinary or overly counter-intuitive ones, and thus are also more effectively distributed."[11] In other words, if an idea is unusual but not obviously implausible, then we are more likely to remember it, and it is more likely that we will share it with others. If we consider the prevalence and similarity of miracle stories in so many different religious traditions, as well as the speed with which conspiracy theories propagate in society, this concept may be less implausible than it perhaps seems upon first hearing. "Counter-intuitiveness has also been shown to enhance the recall of items in experimental conditions. This enhanced recall may explain—*ceteris paribus*—why counter-intuitive representations seem so easily to become widespread in and across cultures."[12] As explified in the notion of "optimally counter-intuitive," religious representations are not simply counter-intuitive, but rather form part of a system of beliefs, some of which are intuitive, while others are counter-intuitive:

> [C]ounter-intuitive representations form only one aspect of religious cognition, the other being that counter-intuitive representations are embedded in intuitive ones. . . . It is the intuitive aspects of religious representations that make them understandable and learnable, but it is the counter-intuitive aspect that makes them religious.[13]

The idea that there are benevolent elders, perhaps aunts and uncles, who might come to one's assistance in times of need is an intuitive one based on our experience of social categories, causal relations, ontological statuses,

and episodic events. Disembodied benevolent others—deceased ances-
tors, saints, bodhisattvas—located in some non-physical reality who can
come to one's assistance in times of need is a counter-intuitive category.

ON RITUAL

Pyysiäinen's treatment of ritual draws on Harvey Whitehouse's stud-
ies of ritual in Melanesia.[14] The cognitive character of Whitehouse's anthro-
pological studies is found in the way in which he bases his distinction
between two modes of religion—imagistic and doctrinal—on two kinds of
memory—episodic and semantic, respectively. The connection between
these two kinds of memory and the two kinds of religious practice is that
in general the doctrinal mode of religion is given its sense of validity
through repetition and is a part of semantic memory, while the imagistic
mode of religion is given its sense of validity through emotional stimula-
tion and is part of episodic memory.

Whitehouse bases his link between mode of religion and frequency of
ritual performance on psychological studies of memory. Episodic memory
(also known as autobiographical memory) involves "recollections of spe-
cific events" and this is "the way people remember revelatory rituals, the
specific moments when their understandings about the nature of the world
were violated or transformed."[15] Infrequent and highly emotionally charged
rituals, such as the Melanesian initiatory rites Whitehouse has studied, are
according to this theory remembered as specific episodes, including such
things as the identity of the specific participants. Infrequency, episodic
memory, and dramatic uniqueness form an integral relation in
Whitehouse's theory:

> The transmission of imagistic practices depends upon the unique
> and intense quality of ritual experience. It is not conducive to the
> cultivation of such messages to repeat them very often. Repetition
> deprives the experience of its uniqueness.[16]

Semantic memory, on the other hand, deals with frequently repeated
events which are "repetitive and predictable" and are remembered in the
form of "scripts or 'schemas'."[17] Frequently occuring rituals, such as a
Sunday service in Christianity, are not remembered as specific episodes,
but rather as a typical sequence of familiar events. While dramatic rituals
recorded in episdodic memory and performed infrequently provide op-
portunities for revelatory shifts of how one understands the world, famil-
iar rituals recorded in semantic memory and performed frequently are
opportunities for inculcating a specific doctrinal perspective. Indeed,

Whitehouse argues that the creation of repetitive ritual is actually more important in the history of religion than the creation of print media:

> [N]otwithstanding those historians who emphasize the impor-tance of printing in the Reformation, it must be appreciated that ideas contained in print were only able to exercise a sustained and uniform influence on those they reached in so far as the written words were continually reviewed and, in practice, rehearsed in countless speech events.[18]

In some places Whitehouse writes as if he thinks of the two modes of religion as forming something of a dialectic. The repetitive quality of doctrinal religion leads to boredom, and this sets the stage for imagistic practices to be appealing.

Pyysiäinen borrows this fundamental three-fold distinction (religious mode, frequency of ritual performance, and type of memory involved) and applies it to the way in which religious belief is created by ritual practices: "[B]elief in the truth and importance of religious beliefs is created in two ways: through repetition and through emotional stimulation."[19] These different ways of creating religious belief correlate with different kinds of rituals. Rituals which are performed repetitively inform doctrinal under-standing, and rituals which are performed irregularly create a memorable experience. Pyysiäinen notes that the two are not mutually exclusive of one another—while repetitive rituals are not specifically intended to create emotional responses, emotional reactions to such rituals may still occur. However, "these emotional experiences are soon interpreted according to the prevailing doctrinal schemata."[20] When that happens, the memories become depersonalized, and are remembered in semantic rather than episodic memory. Emotion is still the key here according to Pyysiäinen, as it is emotion that establishes the sense of commitment to religious doctrines (or what he calls "schematized religious representations"), despite their counter-intuitive character. Further, "doctrines too may be enhanced by imagistic experiences."[21] According to Pyysiäinen, "religious belief" is defined by this emotionally-rooted commitment. In contrast to religious belief is "religious experience" which Pyysiäinen defines as "emotion-laden thoughts and perceptions that come to be encoded in episodic memory as unique events."[22] Pyysiäinen then attempts to ground both religious belief and religious experience in a neurophysiology of emotion: "The emotions that characterize both belief and experience are bodily states that mark religious representations and bodily reactions that are experienced as fear, sadness, happiness, anger or disgust."[23]

Pyysiäinen draws on Damasio's "somatic marker hypothesis" for his link between the emotional basis of religious belief in the bodily responses of fear, and so on, and the character of religious experience produced by

different ritual types. Damasio's hypothesis is that there is an emotional reaction which precedes rational decision-making.[24] This has the evolutionary benefit of reducing the number of alternatives between which a person has to choose. These responses can either be positive or negative, and "may operate covertly (without coming to consciousness)."[25] It is the strength of these bodily responses that give religious beliefs their resilience, despite the counter-intuitive character of those beliefs.

> These somatic markers force particular attention on the negative outcome of the possible rejection of religious belief. . . . Although this holds in most non-religious cases as well, religious thinking is special in that it involves counter-intuitive representations more difficult to process than representations merely confirming domain-specific intuitive ontology.[26]

For Pyysiäinen, then, the two ways of creating religious belief (repetition and emotional stimulation) serve to identify two kinds of ritual (frequent and irregular), which utilize two kinds of memory (semantic and episodic) and characterize two different modes of religion (doctrinal and imagistic). These can be schematized as follows:

MODE OF RELIGION	IMAGISTIC	DOCTRINAL
kind of memory	episodic	semantic
kind of ritual	irregular	frequent
ways of creating belief	emotional stimulation	repetition

According to Pyysiäinen's theory, religious beliefs are counter-intuitive, the commitment to which is grounded in the bodily, preconscious emotional response formed under these two modes of religion.

There is a greater variety to the types of rituals and to the ways in which they may effect us cognitively than Pyysiäinen's bipartite theory would indicate. That Whitehouse has only considered two modes of religion—justifiably so on the basis of his research field—does not mean that there are not more.

PERFORMATIVE MEMORY

Cognitive studies of memory have pointed to a third form of memory—procedural memory. Procedural memory is evidenced by knowing how to do things, and is therefore also sometimes referred to as "procedural

knowledge."[27] As Alvin I. Goldman has pointed out, the "phrase 'how to do things' first brings to mind motor skills, because these are the most concrete examples of procedural knowledge."[28] However, it can also be taken to include "cognitive skills such as decision making, mathematical problem solving, and language generation."[29] In other words, cognitive skills involving "how to do things" as well as specifically motor skills are understood to be part of the same cognitive faculty—procedural memory.[30] Studies of brain activity have found "that extensive practice on a task often produces a shift in the brain pathways used to complete the task."[31] This shift of brain pathway is linked with increased facility in task performance.

Procedural memory does not appear to be as well-studied as other forms of memory.[32] One of the leading contemporary memory researchers, Daniel L. Schachter, tells us that it was only in the early 1980s he began "to take seriously the idea that memory is not a single thing. Laboratory evidence pointed toward three different long-term memory systems: *episodic* memory, which allows us to recollect specific incidents from our pasts; *semantic* memory, the vast network of associations and concepts that underlies our general knowledge of the world; and *procedural* memory, which allows us to learn skills and know how to do things."[33] The procedural memory system "is selectively involved in 'knowing how' to do things: ride a bicycle, type words on a keyboard, solve a jigsaw puzzle, or read words in mirror-image form."[34]

The character of Buddhist ritual practice—repetitive but not semantic, experiential but not emotionally charged—suggests that it employs procedural memory to produce its effects. This appears to also be the case in traditions of Japanese arts (Jpn. *dō*), which employ very repetitive forms of practice emphasizing physical activity. In contrast to the dichotomy proposed by Pyysiäinen, such ritualized practices do not primarily depend on verbal information, i.e., are not primarily semantic; nor do they employ intense emotional experiences. Dorinne K. Kondo has discussed this as a "theory of pedagogy." She says of these "methods of learning and self-cultivation" that

> [O]ne first learns through imitation. Stereotyped movements are repeated endlessly; for example, as a student of tea ceremony, one begins with seemingly simple tasks such as how to walk properly, how to fold a tea napkin, how to wipe the tea utensils. Unlike similar movements in everyday life, these are precisely defined, to be executed "just so." Later these learned actions are orchestrated into a ceremony that is the epitome of "natural," disciplined grace. The martial arts, also arts of "the way" (*dō*), practice their *kata*, patterned movements, until the movements are inscribed in muscle memory.[35]

Kondo's "muscle memory" is procedural memory. This kind of approach to pedagogy is found not only in Buddhist ritual practice and Japanese arts of "the Way," but also informs neo-Confucian educational practice as well. In the following we will explore the tantric tradition of ritual practice found in the Shingon sect of Japanese Buddhism.

SHINGON BUDDHIST RITUAL PRACTICE: EMPTINESS AND CONSTRUCTION OF THE SELF

One of the teachings central to Mahāyāna Buddhism is the emptiness of all existing things, including both objects and persons. Today, from the Mahāyāna perspective, this idea is identified most clearly with the Mādhyamika school of thought from which the terminology of emptiness derives. However, emptiness of the self does have precursors all the way back to Śākyamuni Buddha under different terminology.

The emptiness of the personal self means that there is no permanent, eternal, absolute, or unchanging essence, and not—as the idea of emptiness is misunderstood to mean—that there is no personal self. Rather than a permanent or unchanging self, the personal self as empty does exist as a construct. It is not a given and it is never fully stable. It is, rather, an ongoing construction which may be interpreted as the interface between attempts to preserve our own sense of self-identity—whether positive or negative—in the face of changing situations and expectations.

As cognitive beings we hold mental images, memories, narratives, and so on about the world of our experience.[36] Because we are also self-consciously aware, one of the images that we hold is an image of our self. This self-image is constructed out of our own experience, including what others reflect back to us. The malleability of the self-image suggests that it can be purposely reconstructed.[37]

One way of framing the issue of awakening, then, is how to transform this self-representation from one of a foolish being (Skt. *pṛtagjana*, Jpn. *ishō*), to one of an awakened being. This suggests that a self-representation is the basis for living life from an awakened perspective, changing the way that one not only thinks of oneself, but also the ways in which we engage with others and the world around us. This way of framing the issue purposely attempts to shift the understanding of awakening from being conceived as a sudden, transformative "mystical" experience, to a conception which acknowledges the importance of the interpersonal, social, and cultural construction of such a sense of self-representation. The category of mystical experience introduces a set of problems about defining mysticism and the attendant issues of mediated versus unmediated experience that have proven to be so intransigent that one may reasonably conclude that the problem has been so poorly stated that it is a pseudo-problem. Further,

the rhetoric of transformative experience generally ignores both the social nature of humans and the way in which culture itself molds the developmental process. It assumes that there is an individual person who is separate from both the others around him/her, and separate from the effects of the culture within which the person has grown up. The view being developed here is that one's self-identity is constructed specifically out of interaction with both society and culture, and is fully interdependent with both society and culture. This interdependence is one of the reasons that change is often so difficult—existing ways of being are "over-determined," that is they are supported both by a person's own self-conception and by the conceptions that others have of that person, manifested in the ways that they act toward the person. Consequently, there can be no unmediated, transformative experience occuring to the separate self, since the separate self does not exist. It is important to note that this approach to awakening does not deny the existence or value of transformative experience, but rather intends to open up an understanding of how such experiences become transformative in a particular way, i.e., become defined as Buddhist experiences of awakening.

The emptiness of the self, its constructed nature, matches the findings of cognitive science across the range of different theoretical approaches to cognitive science—computational, connectionist, embodied-enactive. From a religious perspective, the question which needs to be asked then is: How can the nature of the self-representation, the sense of self-identity, be changed, particularly if it is so over-determined?

Turning specifically to the Shingon tradition, as an esoteric or tantric Buddhist tradition, the actual performance of ritual practice is only done by initiates. Different kinds of ritual practices may be performed by different kinds of initiates, from very simple meditative rituals for what may be called "lay initiates" to very complex rituals performed by full initiates (Skt. *ācārya*, Jpn. *ajari*). While there are many different strands making up any polythetic definition of tantra, in this case it is the use of ritual identification that is important to our discussions here. Ritual identification refers to the central ritual action in almost all Shingon rituals—the identification of the practitioner with the deity evoked in the ritual. In the parlance of Shingon ritual manuals, this is known as *nyū ga, ga nyū* (Skt. *ahaṃkāra*) or "me entering, entering me." Through the unity of one's body, speech, and mind with the body, speech, and mind of the Buddha, one gradually learns to live from a perspective of being awakened. The theoretical background for this is the idea that all living beings are already inherently awakened (Jpn. *hongaku*), and that it is possible for human beings to become aware of this state in this very lifetime (Jpn. *sokushin jōbutsu*). According to traditional Shingon interpretations, ritual practice leads to this awareness through three stages.

First, the inherent principle of being awake (Jpn. *rigu-jōbutsu*), which refers to the view that the *dharmakāya*, i.e., Mahāvairocana Buddha, is the actual existence of all things as empty. Second, practice toward being awake (Jpn. *kaji-jōbutsu*), which refers to the power inherent in ritual practice to activate the compassionate response of the awakened consciousness of the Buddha, is itself nothing other than the awakened nature of one's own consciousness.[38] Third, realization of being awake (Jpn. *kendoku-jōbutsu*), which refers to the revealing (*ken*) and acquiring (*doku*) of the awakened character of one's existence.

The hypothesis that I am suggesting here, then, is that the repetitive practice of ritual identification in the course of Shingon training serves to transform the self-image through embodied action recorded in procedural memory. Shingon ritual practice does not fit into either of the two categories of ritual discussed by Pyysiäinen. This would seem to be too sharp a dichotomy for an adequate treatment not only of Shingon, but also of much of Buddhist practice, which works on a repetitive experiential approach. While not disconnected from doctrine (note that the doctrine versus experience dichotomy needs also to be questioned), much practice in the Buddhist tradition is repetitive and primarily experiential. Contrary to Pyysiäinen's use of Whitehouse's paired categories, Buddhist practice is often repetitive without being semantic, and experiential without being highly emotional. It is, however, strongly embodied, a fact reflected in the slogan by which Shingon Buddhism is often characterized: *sokushin jōbutsu*. *Sokushin jōbutsu* literally means "becoming buddha in this body," despite it often being taken to refer to "this lifetime." Conversely, the emphasis on embodiment implies that the obscurations (Skt. *kleśa*, Jpn. *bonnō*) which impede us from living as awakened beings are not simply mental in character. Such mistaken conceptions and misplaced affections are themselves embodied activity that we repeatedly perform (Skt. *saṃsāra*) despite its unsatisfactory outcome (Skt. *duḥkha*). The third form of memory, procedural memory, fits Buddhist ritual practice much more adequately than do either semantic or episodic memory. The constructed character of the self suggests that the self-image can be transformed through embodied activity, and the work of Varela, Thompson, and Rosch has shown that embodied activity is central to cognition.[39]

THE CONTRIBUTION OF BUDDHISM TO
A COGNITIVE THEORY OF RITUAL

In Pyysiäinen's view, repetition is linked with the acquisition of doctrinal claims as discursive elements in semantic memory in such a fashion that they are held as true beliefs, despite their counter-intuitive status. "Rituals form an artificial reality of sorts, set apart from ordinary

life, in which counter-intuitive representations acquire an aura of factuality."[40] In contrast, dramatic, emotionally charged events form the basis for episodic memories, ones which are highly specific in nature—one remembers not only the content of the initiatory teaching, for example, but also the specific participants in the ritual as well. This mode for Pyysiäinen is an emotional one in which brief, intense experiences provide religious experiences which serve to complement religious beliefs. This dichotomy between imagistic and doctrinal modes of religion, or put more simply the dichotomy between emotion and reason, is rooted in the Enlightenment recovery of Platonism, and is such a fundamental assumption in Western society that it has informed the modern study of religion from its origins in the nineteenth century to the present.[41] This suggests that the mind-body, reason-emotion, semantic-episodic distinction serves as a prototypical ontology structuring thought about ritual, but one which does not include Buddhist ritual in its scope.

RELIGIOUS PROTOTYPES IN THE STUDY OF RELIGION AND RITUAL

Ilkka Pyysiäinen opens his *How Religion Works* by noting that the study of religion has depended upon intuitive folk-categories informed by the religious traditions that are most familiar to the scholar. He distinguishes between the category of "religion" as an academic construct, and the phenomena that we identify as religious. The academic construction of the category "religion" does not mean that "scholars have also *invented* religion as a phenomenon." As a constructed category, however, "To the extent that the scholar is guided by the specific tradition(s) with which he or she is most familiar, those traditions exercise a prototype effect on the way the scholar recognizes something as an instance of religion."[42] By "prototype effect" Pyysiäinen is referring here to a cognitive, rather than logical, approach to concept formation.

The classic Aristotelian, or logical, model of concepts is known as "genus and species," meaning that one has a general idea of a category of things or genus, and then a set of discriminating characteristics which identify more specific items within the genus. The paradigmatic example is defining humans as "rational animals." Here humans are defined as being members of the genus animals, the defining characteristic of which is their rationality. While this may be useful epistemologically, it does not represent the way in which we actually form concepts.

Prototype theory, largely the work of Eleanor Rosch, suggests that we have a primary experience which then goes on to serve as the fundamental model for other members of the category. For example, for many people, robins are the prototypical bird. They are much more readily recognized as

members of the category of birds than, for example, penguins or even chickens might be.[43] As Pyysiäinen suggests, this insight is important in a critical approach to the way in which theories of religion are formed. Cognitive theories will need to not only take into account the universal characteristics of human cognition as Pyysiäinen has attempted to do, but also recognize the effects on theory when different religions are prototypical for the theorist. Buddhist thought and practice is important then to the development of a cognitive theory of religion, since it can not only provide important test cases for a cognitive theory of religion, but more fundamentally a radically different prototype for understanding what religion is.

NOTES

1. Ilkka Pyysiäinen, *How Religion Works: Towards a New Cognitive Science of Religion* (Leiden: Brill, 2001), pp. 1–2.

2. Pyysiäinan, *How Religion Works*, pp. 13–14.

3. Note that these are cognitive categories, i.e., psychological in character, and not proposed as metaphysical categories. I would myself understand these as an interaction between the experienced world and the developing cognitive abilities which are shared by humans. There is, perhaps not surprisingly, continuing debate over these ideas, much of which centers on the question of the influence of socially based linguistic categories. See Melissa Bowerman and Stephen C. Levinson, eds., *Language Acquisition and Conceptual Development* (Cambridge: Cambridge University Press, 2001).

4. Pascal Boyer, "Cognitive Constraints on Cultural Representations: Natural Ontologies and Religious Ideas," p. 401 in Lawrence A. Hirschfeld and Susan A. Gelman, eds., *Mapping the Mind: Domain Specificity in Cognition and Culture* (Cambridge: Cambridge University Press, 1994, pp. 391–411).

5. Boyer, "Cognitive Constraints on Cultural Representations," p. 393. See also Pascal Boyer and Sheila Walker, "Intuitive Ontology and Cultural Input in the Acquisition of Religious Concepts," in Karl S. Rosengren, Carl N. Johnson, and Paul L. Harris, eds., *Imagining the Impossible: Magical, Scientific, and Religious Thinking in Children* (Cambridge: Cambridge University Press, 2000, pp. 130–156), and Pascal Boyer, "Causal Understandings in Cultural Representations: Cognitive Constraints on Inferences from Cultural Input," in *Causal Cognition: A Multidisciplinary Debate*, Dan Sperber, David Premack, and Ann James Premack, eds. (Oxford: Oxford University Press, 1995, pp. 615–644).

6. Boyer, "Cognitive Constraints," p. 395.

7. Frank C. Keil, *Concepts, Kinds, and Cognitive Development* (Cambridge: The MIT Press, 1989). Keil himself discusses three different sorts of concepts: natural kinds, nominal kinds, and artifacts (see "Chapter 3: Natural Kinds, Nominal Kinds, and Artifacts"). See also Frank C. Keil, "The Birth and Nurturance of Concepts by Domains: The Origins of Concepts of Living Beings" in Hirschfeld and Gelman, eds., *Mapping the Mind* (Pp. 234–254).

8. Boyer, "Cognitive Constraints," pp. 400–401.

9. Pyysiäinen, *How Religion Works*, p. 23.

10. Ibid., p. 20.

11. Ibid., p. 20.

12. Ibid., p. 23.

13. Ibid., p. 21.

14. Pyysiäinen's treatment of ritual *per se* occupies something under one third of one chapter (twenty pages out of a 236-page work), comprising first a critical review of some of the familar theories of ritual, and then a constructive section, which is almost entirely based on two sources—Harvey Whitehouse's anthropological study of ritual in Melanesia, and Robert N. McCauley's critique of Whitehouse based on his own cognitive approach to the study of religion (with some references to McCauley's joint work with E. Thomas Lawson).

15. Harvey Whitehouse, *Arguments and Icons: Divergent Modes of Religiosity* (Oxford: Oxford University Press, 2000), p. 50.

16. Ibid., p. 110.

17. Ibid., p. 50.

18. Ibid., p. 153.

19. Pyysiäinen, *How Religion Works*, p. 140.

20. Ibid., p. 140.

21. Ibid., p. 140.

22. Ibid., p. 140.

23. Ibid., p. 141.

24. Antonio R. Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York: Avon Books, 1994), esp. pp. 165–222. See also Antonio Damasio, *The Feeling of What Happens: Body and Emotion in the Making of Consciousness* (San Diego, New York, and London: Harcourt, 1999).

25. Damasio, *Descartes' Error,* p. 174. The somatic marker hypothesis has some very close parallels in Buddhist *abhidharma* descriptions of mental processing. Pursuing this comparison, however, falls outside the scope of this essay.

26. Pyysiäinen, *How Religion Works*, p. 141.

27. See for example Timothy P. McNamara, "Single-Code versus Multiple-Code Theories in Cognition," in Robert J. Sternberg, ed., *The Nature of Cognition* (Cambridge: The MIT Press, 1999), p. 116.

28. Alvin I. Goldman, *Epistemology and Cognition* (Cambridge and London: Harvard University Press, 1986), p. 369.

29. Goldman, *Epistemology and Cognition*, p. 369.

30. According to another author, such procedural knowledge also includes perceptual skills as well as motor and cognitive. Hans J. Markowitsch, "Neuroanatomy of Memory," in *The Oxford Handbook of Memory*, Endel Tulving and Fergus I. M. Craik, eds. (Oxford: Oxford University Press, 2000), p. 466.

31. Daniel L. Schachter, Anthony D. Wagner, and Randy L. Buckner, "Memory Systems of 1999," in *The Oxford Handbook of Memory*, p. 636.

32. For exemplary brief discussions of procedural memory, see George Botterill and Peter Carruthers, *The Philosophy of Psychology* (Cambridge: Cambridge University Press, 1999), p. 37, and Francis Crick and Christof Koch, "Towards a Neurobiological Theory of Consciousness," in Ned Block, Owen Flanagan, and Güven Güzeldere, eds., *The Nature of Consciousness: Philosophical Debates* (Cambridge and London: The MIT Press, 1997), p. 279.

33. Daniel L. Schachter, *Searching for Memory: The Brain, the Mind, and the Past* (New York: Basic Books, 1996), pp. 134–135.

34. Schachter, *Searching for Memory*, p. 170.

35. Dorinne K. Kondo, *Crafting Selves: Power, Gender, and Discourses of Identity in a Japanese Workplace* (Chicago and London: University of Chicago Press, 1990), p. 106. Internal reference deleted.

36. The circumlocution here is to avoid use of the term "representations" which has become a key term for particular theories of cognition, i.e., the computational and connectionist approaches. On these matters, see Joseph de Rivera and Theodore R. Sarbin, eds., *Believed-In Imaginings: The Narrative Construction of Reality* (Washington, D.C.: American Psychological Association, 1998).

37. I employ the term "self-image" here in preference to such apparently synonymous terms as "self-representation" or "self-identity" in order to avoid many of the connotations those other terms carry. Self-image is intended simply to identify the full array of ways in which we represent ourselves both to others and to ourself. The dialectical or recursive nature of the process by which self-images are constructed, maintained, projected, and responded to by others not only represents the complexity of the process, but the difficulty of discussing it.

38. This interpretation is informed by the distinction clarified by Jacqueline Stone between two models of *hongaku* thought—one which sees the inherent awakened mind as occluded by obscurations and requiring cleansing, and the other in which all things simply as they are are awakened, buddha-nature. See Jacqueline I. Stone, *Original Enlightenment and the Transformation of Medieval Japanese Buddhism* (Honolulu: University of Hawai'i Press, 1999).

39. Francisco J. Varela, Evan Thompson, and Eleanor Rosch, *The Embodied Mind: Cognitive Science and Human Experience* (Cambridge: The MIT Press, 1993). The embodied-enactive approach to cognition has received convincing support from work in robotics. See Andy Clark, *Being There: Putting Brain, Body, and World Together Again* (Cambridge: The MIT Press, 1997).

40. Pyysiäinen, *How Religion Works*, p. 140.

41. See Ann Taves, *Fits, Trances, and Visions: Experiencing Religion and Explaining Experience from Wesley to James* (Princeton: Princeton University Press, 1999), and Catherine Bell, *Ritual Theory, Ritual Practice* (New York: Oxford University Press, 1992).

42. Pyysiäinen, *How Religion Works*, p. 1.

43. Barbara Knowlton, "Declarative and Nondeclarative Knowledge: Insights from Cognitive Neuroscience," in Koen Lamberts and David Shanks, eds., *Knowledge, Concepts, and Categories* (Cambridge: The MIT Press, 1997), p. 232.