Cognition, Religious Ritual, and Archaeology

by

Robert N. McCauley

Department of Philosophy
Emory University

and

E. Thomas Lawson

Institute for Cognition and Culture
Queen's University Belfast

Introduction

The emergence of cognitive science over the past thirty years has stimulated new approaches to traditional problems and materials in well-established disciplines. Those approaches have generated new insights and reinvigorated aspirations for theories in the sciences of the socio-cultural (about the structures and uses of symbols and the cognitive processes underlying them) that are both more systematic and more accountable empirically than the recently available alternatives. Without rejecting interpretive proposals, projects in both the cognitive science of religion and in cognitive archaeology seek to redress imbalances within those disciplines favoring the interpretive over the explanatory. (See Lawson and McCauley, 1990 and Renfrew, 1994a, respectively.) Both projects aim to reinvigorate scientific aspirations without reviving any sort of scientistic or explanatory *exclusivism*. Both have arisen, in part, in response to the science-bashing crusades that have enjoyed such prominence in both disciplines over the past twenty years.

With the exception, perhaps, of linguistics, the influence of cognitive science has been as notable in archaeology and religious studies as it has been in any discipline in contemporary intellectual life. In both disciplines new sub-fields have begun to thrive, which take theoretical inspiration from cognitive science and, at least sometimes, deploy its findings and, in the case of the cognitive science of religion, even its methods in the course of testing their theories.

This paper contains three sections. The first provides a framework for thinking about the constituents of culture as a means both for situating ritual and for considering its accessibility to cognitive and archaeological analysis. The second section outlines our theory of religious ritual competence and the ritual form hypothesis. The final section reviews the theory's predictions about an assortment of properties of both individual religious rituals and religious ritual systems. It includes occasional speculations about some of the theory's possible implications for some archaeological matters.

A word of caution before we begin . . . we are not archaeologists. Our knowledge of that field is slight. Speculating (anywhere other than, by invitation, here) about how any aspect of our theory might bear on archaeologists' positions or findings or activities (especially their activities in the field) would border on unbridled presumption. Because of a broad coincidence in our orientations, what comments we do offer will look primarily at resonances and connections with work in cognitive archaeology.

I. *The Constituents of Culture*

A central assumption of Dan Sperber's (1996) "epidemiological" approach to culture is that culture is constituted in part through distributions of beliefs in populations of human minds. Humans have all sorts of beliefs. Every human mind contains various idiosyncratic beliefs. Probably, human minds also automatically develop some intuitive beliefs in common. (Tooby and Cosmides (1992) have suggested that the range and variety of this kind of intuitive belief may be far greater than previously suspected.) Human minds also contain other beliefs (both intuitive and reflective) that seem to manifest striking similarities across individuals but that have originated neither as a part of our built-in equipment nor as a standard development thereof but rather on the basis of communication with other people in the course of humans making their ways in the world. Cultures change, in part, because the frequencies of those communicated beliefs change within populations of human minds.

That such regularities across individual minds should exist at all among these communicated beliefs is surprising at one level, according to Sperber, in light of the vagueness and the vagaries of human communication and the tendencies of human minds to misunderstand, to misremember, and to play around with ideas. Sperber insists that communication usually does *not* result in the replication of beliefs but rather in their alteration. Consequently, among other things, this new psychologically grounded account of culture must survey the cognitive variables that influence the shapes of these beliefs as well as their persistence, their proliferation, and their resulting distributions. The shift to the sub-personal, cognitive level is vital, however, since detecting such distributions of beliefs is not the same thing as explaining them. A central question concerns how cognitive processes constrain both the forms of these beliefs and their transmission. (See Sperber, 1996: 106-112.)

Nonetheless, this position entails no drastic psychological reductionism. That is because, first of all, it is not out to explain everything about culture. Second, these widespread, enduring, communicated beliefs are by no means the whole story about culture. They are only a subset of the class of "cultural representations." (Sperber, 1996: 25) An epidemiological approach to culture highlights the causal interactions between these beliefs and a second sort of cultural representation, which Sperber (1996: 61-62) calls "public representations." Public representations of culture basically come in two forms: (1) artifacts (broadly construed to include structured environments as well as tools) and (2) practices.

It is with this addition of talk about these two sorts of public representations that a framework arises within which the central notions that this paper addresses can be situated. So, *archaeology* studies, among other things, the public representations of culture that are artifacts (again, broadly construed) -- from past human groups primarily. The public representations of culture that are practices include *ritual*. An *archaeology of ritual* focuses on the causal relations between ritual and artifacts as public representations of culture. *Cognitive approaches in archaeology, cognitive approaches to ritual,* and cognitive approaches to culture, generally, exploit, among other things, the theoretical, substantive, and methodological resources of the cognitive sciences in order to gain insights about the underlying psychological and cognitive constraints that shape these public representations and their connections. These approaches offer promise for such inquiries for at least two reasons. First, public representations of culture (whether artifacts or practices) occupy that status because human minds either do possess or have possessed (relevant) mental representations. Second, presumptions about conceptual relations between artifacts and practices providing clues about their causal relations reliably depend on assumptions that such conceptual relations are at least represented mentally, if not constituted and mediated mentally as well. (See figure 1.) This calls for elaboration.

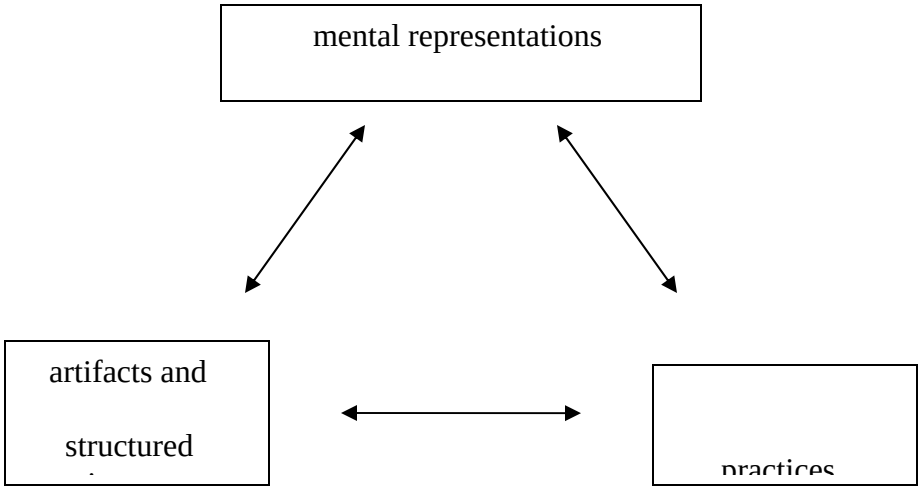

figure 1 causal relations among cultural representations

Virtually all of the public representations that are objects are artifacts.[1] These artifacts include everything from clothes, icons, and gardens to tools, texts, and temples. They are the parts of the natural world that humans have intentionally altered and structured to serve their own purposes. In and of themselves, these objects are not topics of direct psychological investigation, though, as cognitive archaeologists have stressed, human beings have plenty of states of mind and mental representations (that cognitive scientists may study in living human beings) pertaining to such objects. In fact, on Sperber's epidemiological account of culture, humans *must* have (or have had) these mental representations for these objects to exist as public representations of culture at all. As Sperber (1996: 81) notes, public representations of culture "have meaning only through being associated with mental representations." Cognitive scientists are continuing to develop ever more sophisticated means for acquiring empirical evidence about the character of those mental representations. Cognitive archaeologists have made valuable contributions here by investigating the inferences that can be drawn about mental representations on the basis of the remnants of the material cultures available. (For examples, see Mithen, 1996 and Renfrew and Scarre, 1998.)

Typically, the mental representations and states of mind pertaining to artifacts are tied up with various practices associated with those objects. It is such bonds that enable archaeology to

[1] Exceptions include some natural arrangements imbued with cultural valence. Some (e.g., Mt. Fuji) may undergo some minimal human manipulation. Others (e.g., the sun) do not (yet).

contribute to our understanding both of cultures' practices and of the accompanying mental representations. (Renfrew, 1994b, p. 51) Such practices concern language, education, agriculture, politics, religion, art, science, and more. The link between practices and mental representations is, perhaps, even more transparent than is the one between mental representations and artifacts. That practices are practices and that they are the specific practices that they are clearly depend at least as much upon people's mental representations as they do upon those practices' publically available properties.[2]

This is particularly true about rituals. That the practices that constitute a wedding are the practices that constitute a wedding depends crucially upon the participants' beliefs about those practices. Our theory of religious ritual competence examines the underlying psychological and cognitive constraints that shape this particular type of cultural practice. (Lawson and McCauley, 1990; McCauley and Lawson, 2002.) The cognitive approach to the study of ritual concentrates (1) on the similarities among the mental representations that people possess about ritual actions, (2) on cognitive explanations of those similarities, and (3) on the implications of the cognitive theories behind those explanations for further explaining a variety of rituals and ritual systems' features.

The strategy of studying ritual by attending to the mental representations that accompany those cultural practices offers some significant advantages. Approaching ritual or any other cultural phenomenon in this way increases the prospects for testing hypotheses experimentally, since the cognitive sciences generally and psychology especially have developed far more extensive and sophisticated experimental means for testing theories than have the social sciences. Moreover, minds and brains (even more so) are both more discrete and more localized than cultural systems are. We do not wish to overplay this last point, though, since it touches directly on the relationship of the cognitive approach to ritual and cognitive archaeology. Let us explain.

[2] This is not to imply, however, that the relevant representations are either always or even usually *consciously* available to practitioners. For example, virtually no utterances involve a speaker's conscious awareness, in any sense, of the grammatical principles of the language in which the utterance has been formulated.

The causal arrows in figure 1 are all *bi-directional*. No doubt, for many explanatory purposes, our skulls basically limn the contours of our cognitive systems. However, if for no other reasons than the pervasive and pivotal roles of perception and action for the human cognitive economy, for many other explanatory purposes cognitive analyses of culture will not only require the examination of the causal relationships between mental representations and public representations (both artifacts and practices), they will also often require the *inclusion* of both public representations and those causal relationships in their characterizations of the relevant cognitive processes. Cognizing and cultural cognizing, in particular, is regularly *situated* cognizing. (Hutchins, 1994) Or, alternatively, if not our minds, then certainly our mentality constantly extends into the external environment, which is to say that it extends into the public representations of culture. Carrying out what may initially seem like thoroughly *cognitive* tasks commonly involves explanatory appeals to public representations. So, for example, I can "remember" what to take to the office each day by consulting a list I compile across the previous day that is left by the door to the carport. Remembering here employs an *external* tool that enables me to gather the items that I will need at considerable temporal remove from when they came to mind. My mnemonic skill in this case unequivocally depends on structures outside of my cranium that I have imposed on the environment.[3]

[3] This point has *genuine practical import*. For example, moving the elderly from their homes, for which they not only have well-developed spatial memories for their layouts but particularly for the locations of the tools that we all require to get through a day, to assisted living facilities, for which they do not possess such memories, can result in the appearance or, worse, the mis-diagnosis of dementia.

Cognitive scientists, such as Merlin Donald (1991), William Bechtel (1996), and Andy Clark (1997) have underscored the vital role that external prosthetic devices often play in our cognitive accomplishments. Our species' development of language[4] (at least tens of thousands of years ago) and the technology of literacy (a few thousand years ago) have driven the most profound changes in our cognitive abilities. By imposing structures on our environments and especially by imposing coded, symbolic structures on them, we expand our cognitive horizons by according things in the world -- from the books that fill our libraries to the world wide web -- roles to play in our cognitive processing, transforming these materials in question into cognitive devices.

Human beings are often incapable of solving problems without such tools. Try multiplying two four digit numbers without using one of these tools or another. As Matthew Day notes, even "for . . . problems like this run-of-the-mill multiplication task, the solution is often *unthinkable* without the aid of these cognitive artifacts." (Day, 2004, p. 107). An important debate within the contemporary cognitive science of religion concerns the extent to which *religious* cognition depends upon possessing such external cognitive artifacts.

Pascal Boyer (1994a and 2001) has tended to downplay the place of such external cognitive gadgetry in religious cognition. Boyer argues that religious cognition is the *natural* outcome of common variations across a constellation of *internal*, domain specific, cognitive dispositions that have evolved in the human mind. On his view, religious representations readily arise in human minds, and once they do, they are particularly likely to persist and get transmitted to other minds. Religious representations are ideas that human minds find good to think. Religious artifacts only play a prominent role in the *transmission* of religious ideas (if even there). They may enhance the appeal of religious ideas, but for Boyer those ideas originate and persist in human minds because of their *intrinsic* psychological interest.

It should come as no surprise that cognitive archaeologists put greater emphasis on the role of external over internal cognitive equipment and on the role of such equipment in religious cognition, in particular. Their objects of study, after all, are the cognitive accessories that are outside of human heads. Cognitive archaeologists raise two pivotal issues at least about cognition. The first concerns what kind of mind it takes to have created such artifacts. The second, which is the issue at hand, deals with what such artifacts enable these minds to do. When he claims that "we transform religious ideas into material form so that we can perform operations on them which are *beyond the capacity of the mind*," Steven Mithen falls short of adopting the strong position Day scouted above, since he does not hold that all religious ideas depend upon such artifacts for their *creation*. (1997, p. 72, emphasis added) But he and other cognitive archaeologists argue, in effect,

[4] Undoubtedly, the development of language is our most fundamental accomplishment on this front, however, we will not discuss the role of *spoken* utterances in any systematic way, since they are not part of the *persisting* material culture that archaeologists can study (at least not until the development of audio recording in the last century).

that accounts of religious cognition, let alone of religion, will prove needlessly impoverished and, at least some of the time, notably incomplete, if they ignore the contributions that public representations of culture play. (See, for example, Renfrew, 1998, p. 2.)

We agree with Boyer that religious cognition, at least *comparatively* speaking, involves forms of thought that human beings find much easier and more natural to handle than they do many others (for example, many of the forms of thought necessary for doing science). (McCauley, 1999a and 2000a) Furthermore, since *we discover almost none of our tools in nature fully formed*, it seems fairly clear that activities *inside* human heads bear the principal responsibility for getting this synergistic relationship between our mental states and aspects of the external environment rolling. This is why the *fabrication* of tools plays such a prominent role in the discussions of both archaeologists and primatologists. (Mithen, 1996 and Boesch and Boesch, 1993) But those observations do not diminish the importance of Day's (forthcoming) argument that those tools regularly provide a "scaffold" that is indispensable to many of our subsequent cognitive activities and achievements. The simple storage of information in texts, instead of in human memories, is probably the most obvious illustration -- a topic to which we shall return at the end of this section.

When construing ritual as the outcome of situated cognition, exploring the connections between cognitive theorizing about ritual and the cognitive archaeology of ritual brings us to the crossroads of this debate. Ritual performances, no less than spoken words, are transitory public representations of culture. (See footnote 4 above.) Ritual is neither the cognitive dispositions and representations that constitute ritual knowledge and inform ritual performance that our theory discusses nor the artifacts and structured environments that are inevitably associated with performances that cognitive archaeologists study. These, however, are -- from the standpoint of this more liberal cognitive approach to culture -- the two key variables (internal and external, respectively) that shape, constrain, and illuminate ritual performances.

Like any other archaeologists interested in ritual, cognitive archaeologists scrutinize artifacts in order to obtain evidence about rituals, however, cognitive archaeologists must also remain alert to the bearing of material culture on the guiding questions in their field, viz., "what do artifacts show about the minds that created them?" and "what do those artifacts enable those minds to do?" Cognitive archaeologists attend to the clues that artifacts offer about their creators' psychological states and cognitive accomplishments. Thus, they burden themselves with an extra problem, but they also enjoy an extra set of inferential opportunities. A culture's artifacts and its practices not only provide evidence about one another, they also constitute evidence about cultural participants' mental representations. (Mithen, 1996) Consistent with the *comprehensive* set of possibilities that figure 1 illustrates, though, the crucial point for our purposes here is that independent evidence from cognitive science about cultural participants' mental representations can offer insights about their public representations too. Our theory analyzes the links between participants' mental representations and their ritual practices. The hope here is that summarizing its major commitments in the next section will spur archaeologists' reflections on these matters in some useful way.

Whether our specific theory will prove helpful or not, the framework we have sketched suggests adding a fifth type to Colin Renfrew's list of four types of evidence available to anthropologists about cultural participants' mental representations pertaining to ritual. (1985, pp. 12-13) Renfrew cites

(1) verbal testimony (both oral and written),
(2) direct observation of practices,
(3) non-verbal records (e.g., depictions documenting beliefs and practices), and
(4) material culture (both artifacts and structured environments).

To this list we propose adding cognitive and psychological evidence about the mental representations of religious ritual participants.

This evidence comes in two forms -- ethnographic and experimental. (See, for example, Abbink, 1995 and Malley and Barrett, 2003, respectively.) Behind the contention that *experimental* evidence from contemporary populations of subjects may have some bearing on archaeologists' proposals about past cultures stand assumptions about features of human minds that have persisted for dozens of millennia in the face of considerable cultural variability -- as Boyer is wont to stress. This is hardly less true about the applicability of *ethnographic* evidence in an age in which scarcely a single place on earth that humans inhabit remains untouched by radio, air travel, television sets, T shirts, and baseball caps. Wary of evolutionary psychologists' strong claims about fixed mental modules in contemporary human minds, Mithen argues for increasing "cognitive fluidity" between these domain specific capacities over our genus' evolutionary course. Yet even he thinks that such cognitive fluidity results in *recurring patterns of religious representations* (such as totemism and anthropomorphism) throughout human groups, regardless of their material circumstances. (Mithen, 1996, pp. 164-167)

In contrast to the approaches that have dominated religious studies and the psychology of religion for the last hundred years, the cognitive science of religion looks *primarily* to cognitive constraints both on the forms of religious representations and on their transmission, rather than to religious experience, to explain these recurring patterns. (McCauley, 2000b) The two most important rationales that researchers cite are, first, that *many* participants in religious systems do not have anything that either they or those who study them are inclined to describe as uniquely religious experiences, and, second, that whatever role extraordinary experience may play in the generation of religious representations, those representations inevitably encounter selection pressures in the course of their transmission. Their successful transmission turns on them assuming forms that are, at least, recognizable, attention grabbing, memorable, motivating, and communicable. Boyer has discussed the first three of these considerations at length and in detail. (1994b, 1999, and 2001) In our discussions of religious ritual we have focused on the third and the fourth, i.e., on memory and motivation. (McCauley, 1999b and McCauley and Lawson, 2002)

In reflecting on the contributions of material culture to our cognitive accomplishments, we noted earlier that probably the most conspicuous example is how we use written materials, instead of our memories, to store information. Literacy can promote the preservation, propagation, and elaboration of religious representations, including rituals, just as it can with any other cultural form. This may well be why Renfrew lists verbal testimony, including written verbal testimony, first among the forms of evidence available to anthropologists (and archaeologists) interested in ritual. (See Whitehouse and Martin, 2004.)

Nonetheless, it is non-literate (and overwhelmingly illiterate) societies that occasion the most interesting questions for a cognitive theory of ritual for at least three reasons. First, our theory looks to recurrent features of the human mind to account for some of the recurrent features of religious ritual. It does not follow on our account that literacy does not matter, but it does follow that with respect to the recurrent features in question, it probably does not matter nearly as

much as it does on other fronts. The forms the theory describes should be ones that *all* religious ritual systems manifest. Second, religion predates literacy. Religious representations first erupted and were transmitted among our ancestors before anyone had ever thought of written linguistic symbols. Third, without the aid of lasting public representations of linguistic symbols, the dynamics of human memory abetted only by non-linguistic artifacts disclose a clear cognitive core to these cultural questions. Without the aid of texts, the responsibility not only for remembering what rituals are about but for remembering the rituals themselves falls to individual human memories and their external, non-linguistic, cognitive contrivances.

We raise this point, because human memory only abetted by non-linguistic artifacts is precisely the circumstance in which archaeology would seem particularly well-suited to contribute to our knowledge about ritual. Relevant anthropological evidence indicates, however, that, in small scale societies at least, drawing inferences about either rituals or participants' mental representations in non-literate societies where the only lasting public representations are non-linguistic is tricky business. If that is so, then, presumably, any aid a cognitive theory of ritual might supply should be welcome.

The most orderly connections that Fredrik Barth finds among the Baktaman (a non-literate, small scale society in the highlands of New Guinea) is what he calls "analogic coding." (1975, pp. 207-231) Analogic coding exhibits neither any "logical closure" nor some "limited set of alternatives." (Barth, 1975, p. 208; also see p. 229.) Each setting in which the Baktaman reuse a ritual artifact involves what are otherwise undisclosed symbolic nuances. As often as not they invite new interpretations that introduce new values for these various artifacts. (Barth, 1987, p. 76) "The medium is one of metaphor, as in the manipulation of sacred concrete objects and ritual acts to generate statements about fertility, dependence, etc." (Barth, 1987, p. 75) The underlying "metaphors" are "non-verbal," because the symbols are non-linguistic, concrete artifacts and because the Baktaman are either unwilling to articulate these symbolic relations or incapable of doing so.[5]

Barth (1987, p. 76) holds that participants possess this analogically coded knowledge *intuitively*. The anthropologist cannot reduce such knowledge to unambiguous propositional form, but this does not entail that either its *contents* or, especially, its *effects* are utterly random. "The medium in which the knowledge is cast allows other and rich forms of understanding . . . " (Barth, 1987, p. 76) The inevitable vagueness surrounding these artifacts and rituals' contents requires that an analysis of transmission highlights neither "the sayable" nor "[the] said" but only what is "received," "reactivated," and "constantly re-created" via those metaphors and idioms that "catch on and are re-used."

Two comments are in order here. First, Barth's more detailed comments about those other, rich forms of understanding that analogic coding facilitates concern the artifacts and rituals' effects (rather than any putative contents). The male initiations, on which Barth focuses, transform "a group of young persons into men" who possess "a general area of common sensibilities and intuitions" and "a range of understandings sufficient so its members can be moved by the same symbols and thoughts." (1987, p. 79) Baktaman initiations instill in the initiate distinctive

[5] Although much that he says could be construed as evidence for the claim, Barth does not consider the possibility that such (coded) symbolic relations simply do not exist. (See Sperber, 1975.)

cognitive dispositions and sensibilities concerning self, cohort, society, and Nature, as opposed to any clear symbolic contents. Second, although he characterizes his specific approach as "generative" (1987), Barth's project can also be fairly described as "epidemiological." He (1987, p. 28) maintains that "every person's mind is full of representations of cultural objects, which are handled by mental processes and in due course give shape to the person's acts." For Barth, like Sperber, the chief task is to delineate the causal variables that shape the distributions of cultural representations.

In the next section, we will, in addition to outlining our theory, briefly sketch, near the end, some of its implications for an epidemiological analysis of one salient cognitive variable that shapes religious rituals, viz., memory. The necessary conditions for the successful transmission of cultural representations that we enumerated above dictate that *remembering* rituals and creating the sort of social psychological effects that Barth describes (particularly *motivating* participants to transmit the relevant mental representations to appropriate others) are key selection pressures shaping a religious system's rituals.[6] Although we have discussed both, we will focus on the former here. We have argued that rituals' mnemonic effects are precisely ones that the experimental literature in cognitive psychology suggests make for enhanced accuracy. We have also argued, though, that whatever accuracy of recall is achieved is not to insure the faithful transmission of contents so much as it is to increase the probability of a communal sense of continuity in the transmission of cultural materials and to decrease the probability of introducing socially divisive variations. (McCauley, 1999b and McCauley and Lawson, 2002)

II. *The Theory of Religious Ritual Competence*

Theorizing about religious ritual systems from a cognitive viewpoint involves (1) modeling cognitive processes and their products and (2) demonstrating their influence on religious behavior. Particularly important for such an approach to the study of religious ritual is the modeling of participants' *representations* of ritual form.

The theory of religious ritual competence models the *tacit* knowledge that participants possess about their religious rituals. The principal evidence about that competence is the rich body of intuitions participants have about a variety of features concerning their rituals that pointed investigations can tap. (McCauley and Lawson, 2002, pp.4-6)

The theory's most basic commitment is that the cognitive apparatus for the representation of religious ritual form is the same system deployed for the representation of action in general. The differences between everyday action and religious ritual action turn out to be fairly minor from the standpoint of their cognitive representation. This system for the representation of action

---

[6] The preservation of the metaphors and idioms by which Baktaman knowledge is communicated turns primarily on their employment in repeated communications (however vague) associated with the themes that underlie Baktaman ritual praxis. Still, neither Barth nor his informants (1987, pp. 26-27) hold that any cues or constraints, which the frequently confronted metaphors and idioms occasion, suffice to account for the similarities between two consecutive performances of initiations within any community. Barth and his informants agree that it is the attempts by the seniors responsible for staging these initiations to *recall* past performances that is the primary influence on the shape of the next one. (1987, p. 26)

includes representations of agents. Whether we focus on an everyday action such as closing a door or a ritual action such as initiating a person into a religious group, our understanding of these forms of behavior as actions *at all* turns critically on recognizing agents.

The theory's second crucial commitment is that the roles of agents possessing counter-intuitive properties (CI-agents[7] hereafter) in participants' representations of religious rituals will prove pivotal in accounting for a wide variety of those rituals' properties. "For effective ritual, the deity . . . must in some sense be present." (Renfrew, 1985, p. 18) By examining how ritual participants represent the "presence" of CI-agents in their rituals, the theory accounts systematically for a constellation of religious rituals' varying features.

The claim that this commitment to the existence of CI-agents is the most decisive recurrent feature of religion across cultures is controversial. With everything from Theravada Buddhism to Marxism to football in mind, some scholars maintain that presumptions about CI-agents are not critically important to religious phenomena. On this view cheering at football games or marching on May Day are just as much religious rituals as sacrificing pigs to the ancestors. Perhaps, but in that case what we have, then, may not be a theory of religious ritual. Instead, it is only a theory about actions that individuals and groups repeatedly perform within organized communities of people who possess conceptual schemes that include presumptions about those actions' connections with the actions of agents who exhibit various counter-intuitive properties. If that is not religion (and religious ritual), so be it, but we suspect that this description covers virtually every uncontroversial case that anyone would be inclined, at least pre-theoretically, to include as an instance of religion and very few of the cases they would be inclined to exclude.

Rituals often occasion an astonishingly wide range of interpretations from both participants and observers. The meanings associated with rituals may vary, but such variability typically has no effect on the stability of the rituals' underlying forms. Although they have brought nearly as many interpretations as the times and places from which they hail, pilgrims to Mecca continue to circumambulate the Ka'bah the same way year after year. Not only do other things matter besides meanings, for some explanatory purposes meanings may hardly matter. See, for example, Jason Slone's (2004) account of the absence of nuns in contemporary Theravada Buddhism. We think that much about religious rituals' forms are overwhelmingly independent of meanings. There is also a respect in which some very general features of ritual form are not only independent of meanings but even of specifically cultural details. In other words, these very general features of religious ritual form are independent of both semantic and cultural contents. Clarifying these general features of action is valuable for distinguishing the roles CI-agents can play in participants' representations of their religious rituals.

The action representation system humans possess imposes fundamental, though commonplace, constraints on ritual form. Attention to these constraints enables us to look beyond the variability of religious rituals' details to some of their most general underlying properties. The crucial point is that religious rituals (despite their various unusual qualities) are actions too. Postulating special machinery to account for the representation of religious rituals is unnecessary.

---

[7] Previously, we have referred to "culturally-postulated superhuman agents" or CPS-agents. We abandon that usage, since cultures are not the sorts of things that postulate anything, so far as we can tell.

The requisite cognitive equipment is already available. A wide range of evidence from developmental psychology indicates that from early infancy human beings represent agents and the actions they perform very differently from the ways they represent other entities and events. (See Michotte, 1963 and Rochat, 2001.) Developmental psychologists have discovered that infants know (and therefore are capable of representing) the difference between the agent and the patient of an action as well as whether the patient is just an inanimate object or also an agent capable of acting too. This is to say that they distinguish the vital action roles from one another as well as the sorts of entities capable of filling each.

Humans pick out agents on the basis of a host of cues concerning such things as characteristic structures, motions, and behaviors. So, agents have faces and bodies with bilateral, vertical symmetry. They are self-moving, often with irregular but goal-directed motions, paths, and speeds, and they have particular facial and bodily motions that correlate with various emotional and intentional states. At as early as nine months, we seem capable not merely of recognizing agents but of attributing goals to them. (Rochat, 2001) By roughly the age of four a child grasps that human agents' understanding of their world depends upon how their minds represent it. (Wimmer and Perner, 1983 and Perner et al., 1987) Children recognize agents' intentionality, i.e., they formulate mental representations of other people's mental representations. They come to understand that what people do (usually) depends upon how they represent their actions to themselves. By roughly school age, children have obtained all of the fundamental presumptions built into what developmental psychologists call a "theory of mind" -- a theory that may undergo further elaboration but whose basic assumptions undergo no substantial change thereafter. (Wellman, 1990) This cognitive machinery for the representation of agency and action seems task specific, and it is -- with only a few exceptions -- ubiquitous among human beings. (Baron-Cohen, 1995) The representation of religious rituals requires no special cognitive apparatus beyond this garden-variety cognitive machinery all normal human beings possess.

Agents and their agency are clearly the pivotal concepts for the representation of action, but they are not the whole story. A basic representational framework for characterizing this special sort of event must also capture familiar presumptions about the internal structures and external relations of actions too. The action representation system captures basic action structures, which, among other things:

(1) include the roles (agents, acts, instruments, and patients) that distinguish actions (and rituals) from other events and happenings,

(2) take -- as action (and ritual) elements -- the various entities and acts, as well as their properties, qualities, and conditions, that can fulfill these roles in actions (and religious rituals),

(3) reflect the constraint that although any item filling the role of the agent may also serve as a patient, not all items that serve as patients may also fill the agent role,

(4) reveal points of variability in the forms of actions such as whether they involve the use of instruments as a condition of the act, and

(5) accommodate the enabling relationships between actions, such as whether the performance of one act presupposes the performance of another.

Normal human beings have a ready intuitive grasp of all of these matters.

Since all religious rituals on our theory consist of agents acting upon patients, a description of a religious ritual's structure will include three ordered slots for representing a religious ritual's

three fundamental roles, viz., its agent, the act, and its patient. All of a ritual's details fall within the purviews of one or the other of these three roles. (See figure 2.)

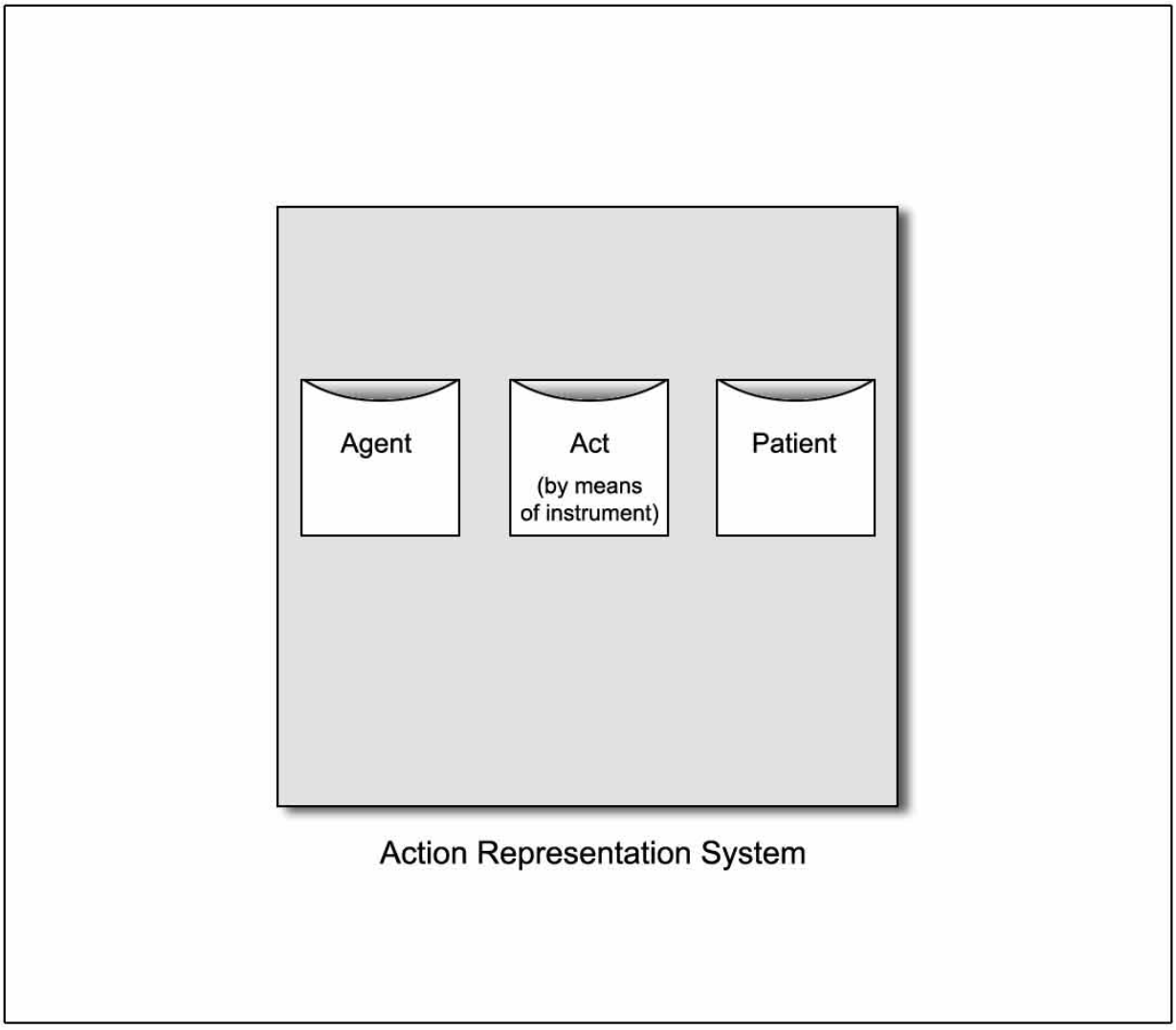

Figure 2 Action Representation System

Our claim that all religious rituals (as opposed to religious action more broadly construed) include an agent doing something to a patient departs from popular assumptions. Priests sacrifice goats, ritual participants burn offerings, and pilgrims circle shrines, but people also pray, sing, chant, and kneel. Even though such religious activities may be *parts* of religious rituals, in and of themselves, they do not qualify as religious rituals in our theory's technical sense. On our theory all religious rituals are inevitably connected sooner or later with actions in which *CI-agents putatively play a role* and which *bring about some explicitly describable change in the religious*

world. So, initiations are religious rituals on this account. In participants' representations of initiations, CI-agents are ultimately responsible for the initiate's change in religious status. Sometimes those CI-agents participate directly. Frequently, initiations culminate in meeting the CI-agent face to face. (Renfrew, 1985, p. 18) Often, though, this link to the actions of CI-agents is indirect. CI-agents can act through their ritually appointed intermediaries, e.g., an ordained priest.

We advance this restricted notion of religious rituals for four reasons. The first is that invariably, religious rituals, unlike mere religious acts, bring about changes in the religious world (temporary in some cases, permanent in others) by virtue of the fact that they involve transactions with CI-agents. Those interactions affect -- on the basis of inter-subjectively available information -- to what or whom anyone can subsequently apply the religious category associated with this act and that application does not turn on the participants' states of mind. So, for example, if the priest baptizes Paul, then henceforth the term "baptized" may be used to describe Paul, *regardless of Paul or the priest's states of mind* when the ritual occurred. (What will matter is only that the priest qualifies as an appropriate ritual agent--which, itself, turns on the priest's own ritual history.) In short, religious rituals in our technical sense are religious acts that cannot be faked. This is not true about religious actions (such as prayer) that are not rituals in this more restricted sense.

Second, religious rituals are distinguishable on the basis of what we have called an "insider-outsider criterion." Although mere religious actions are typically open to outsiders, religious rituals are restricted in some way. (Who counts as an "outsider" may change over time.) A non-Catholic is welcome to pray with Catholics but not to take the Eucharist. Although anyone can practice yoga, only Brahman boys can be invested with the sacred thread. (Penner, 1975) Excepting "entry level" rituals (for example, for juniors or new converts), those who are not participants in the religious system are not eligible to participate in that system's rituals. The third consideration is that rituals are invariably associated with other rituals. Other sorts of religious actions need not be. Again, excepting entry level rituals, participating in religious rituals turns unwaveringly on having performed earlier religious rituals. A Jew must have gone through his bar mitzvah in order to qualify to become a rabbi but that is not necessary for him to be eligible to pray. Below we shall develop this idea further in the discussion of the embedding of what we call "enabling" rituals within the representations of rituals. The fourth ground for employing our technical sense of the term "religious ritual" simply looks to the theory's explanatory success (and to the success of the resulting research program the theory inspires). If a theory is successful on many fronts, then that fact is relevant to the defense of any of its details.

The action representation system can represent ritually salient qualities and properties of the agents, actions, and patients. This includes specifying what makes the agent eligible to perform the action, what properties a particular act must possess, as well as the qualities of the patients that make them eligible to serve in that role. The conceptual schemes of particular religious systems will designate which qualities and properties matter. A cognitive representation of a religious ritual will include the formal features that determine participants' judgments about that ritual's status, efficacy, and relationships to other ritual acts.

Just as participants possess qualities and properties that may require specification, sometimes conditions on ritual actions do too. Rituals sometimes require fulfilling particular conditions for their execution; for example, carrying out some task may require particular

instruments. Ritual agents often need specific tools in order to do their jobs properly. These tools can be anything the tradition permits -- antelope bones for divining, sharp stones for circumcisions, red ochre for coloring corpses, or nettles for whipping initiates. Instruments, however, should not be confused functionally with agents (though religious conceptual schemes sometimes include entries that conflate them ontologically -- Boyer, 2001). For example, a priest uses incense to sanctify a house or uses rocks of a particular shape to establish a temple site. While these instruments are not the agents, they often specify necessary conditions for the success of the agents' ritual actions. If so, it is only by virtue of their ritually mediated affinities with superhuman agency that they derive their efficacy. (Water that has not been consecrated is just plain old water.) The action representation system includes resources for representing the instruments agents employ (the water) as well as their qualities that the conceptual scheme defines as relevant (that it has undergone an earlier ritual sanctifying it). A complete representation of a ritual will, at least, include a representation of an agent with the requisite qualities acting upon a patient with the requisite qualities potentially using an instrument with the requisite qualities.

The most important of the requisite qualities of instruments are their own attachments to CI-agents through the performance of earlier rituals. Making sense of a religious ritual typically involves reference to a larger network of ritual actions. Performing earlier rituals enables the performance of the later ones. Because the priest has blessed the water in the font, participants can use it to bless themselves when they enter the vestibule of a church. These earlier rituals that fulfill necessary conditions for the performance of subsequent rituals are what we call "enabling rituals" (or, more generally, "enabling actions"). In everyday life, actions frequently presuppose the successful completion of previous actions, since those earlier actions fulfill necessary requirements for the performance of the action at hand. For example, operating a car presupposes that someone has put gas in the tank. If there is no direct reference to a CI-agent in a ritual's surface structure, then at least one of its elements must incorporate presumptions about its connections with one or more enabling rituals that eventually implicate a CI-agent. The classic rites of passage offer the best illustrations of these enabling relationships. Consider the sequence of initiation rites among the Zulu. In order for a Zulu male to be eligible for marriage, he has to go through a number of rites of passage starting with the naming ritual and proceeding through the ear-piercing ritual, the puberty ritual, and the “grouping up ritual.” (See Lawson and McCauley, 1990, pp. 113-121.) No uninitiated person can initiate the newcomer. Ritual practitioners performing the initiation will have to have been initiated themselves. (Ritual "practitioners" are participants who hold some privileged religious status by virtue of which they are able to serve as the proximal agents in some rituals that other participants, who do not share their status, cannot.) Ultimately, the gods are responsible for the initiations through these ties to the ritual practitioner, i.e., the immediate ritual agents who serve as the gods' intermediaries.

In the everyday world the exploration of such presuppositions can go on indefinitely either by tracing causal chains (the window broke, because the ladder fell and hit it, because the ground on which it rested was damp, etc.) or by concatenating reasons (John flipped the switch, since he wanted to see the room's contents, since he wanted to ascertain whether he could load them into the truck in the next ten minutes, since, if at all possible, he wanted to complete that job before the police arrived, since he wanted to avoid arrest, etc.) Religious rituals, while engaging the same representational resources, always presume an end point to such causal or rational explorations. With rituals things come to an end. Causal chains terminate; reasons find an uncontroversial

ground. In short, the buck stops with the gods. The introduction of actions involving CI-agents into the conception of an action introduces considerations that need neither further causal explanation nor further rational justification. Religious rituals can be accorded representational closure by terminating in the deeds of CI-agents. The actions of the gods ground religious rituals' normative force. Despite talk in the humanities and social sciences about civil religion, the religion of art, the rituals of football, or the theology of communism, such systems rarely engender such immediate authoritativeness. Our suggestion is that this is because they rarely involve such appeals to specific actions of CI-agents.

Finally, it is what the gods do that matters in religious ritual. Our theory of the cognitive representation of ritual provides descriptions for religious ritual actions, which are, in one respect, exhaustive. For participants there is no more momentous cause to locate, no more crucial reason to propose. The actions of the gods guarantee the comprehensiveness of description, because their actions are causally, rationally, and motivationally sufficient for the ritual actions they inspire. The actions of the gods that serve these foundational roles are what our theory characterizes as *hypothetical* religious rituals. They are actions attributed to the gods to which humans appeal in the course of carrying out their own rituals. So, for example, the authority of popes might turn on Jesus' declaration that Saint Peter was the rock on which he would build his church. Participants appeal to such founding "hypothetical rituals" as actions enabling their own religious ritual practices.

Our ability to attribute the category of agency (and the inferences that accompany it) is the most significant piece of ordinary cognitive equipment deployed in the representation of religious rituals. The notion is fundamental in any theory of religious ritual, because it drives our most basic expectations about the form of *any* action. The identification of action turns critically on the identification of agents. The point is that we import all of our assumptions about agents and their actions when representing CI-agents and rituals. Participants' intuitive assumptions about the psychology of agents purchase them vast amounts of knowledge about CI-agents for free. (Boyer, 1996) So, for example, on the basis of knowing that some CI-agent desires X and believes that doing Y will enable her to obtain X, participants will know that it is likely that the CI-agent in question will do Y. Or knowing that the ancestors are easily offended, if they are not offered the best available foods, and that they are likely to cause mischief in the community when they are offended, participants will recognize that they should insure that the ancestors are well fed. Or, again, knowing that the gods have thought carefully about the laws they have instituted for human conduct, participants know that violations of those laws will likely provoke angry responses from the gods. The "special-ness" of religious rituals, then, does not turn on anomalies in their basic action structures or with irregularities in the way that CI-agents exercise their agency. *Qua agents*, CI-agents are quite similar to human agents; that is why we can so readily draw inferences about their actions, their goals, their desires, and their other states of mind.

On a few fronts, though, CI-agents differ decisively from human agents, and it is those differences that make representations of religious rituals different from representations of ordinary actions. CI-agents possess various counter-intuitive properties. As Boyer argues, those properties arise from violations of the default assumptions associated with basic ontological categories concerning the physical, biological, and psychological realms. So, for example, if something is an agent, then (normally) it is also a physical object and possesses all of the associated physical properties. CI-agents may differ from normal agents in that they *violate* the constraints this

superordinate category, 'physical object,' imposes. Thus, they may pass through solid objects or be everywhere at once. CI agents may violate constraints that other superordinate categories impose. So, CI agents can be eternal, parentless, and capable of recovering from death and they can know other agents' states of mind. (Boyer, 2001)

On our theory, then, very little distinguishes religious rituals from other sorts of actions. A religious system's conceptual scheme provides *special entries* for at least some of the slots in a description of a ritual's structure. For example, the specific acts carried out in religious rituals (such as sacrifices, blessings, consecrations, and so on) are often unique to religious conceptual schemes. Crucially, only with religious rituals do populations of participants carry out actions that routinely presume enabling actions by CI-agents with special counter-intuitive properties, and what we might loosely call inquiry about the causal or rational foundations of religious rituals will always come to an end when they invoke the enabling actions of CI-agents.

It is the roles that CI-agents play in rituals' representations that are the critical variables that determine many of their important properties. Our theory identifies two principles for organizing this information about the impact of CI-agents' roles on religious ritual form. They jointly yield a typology of religious ritual forms that systematically organizes the rituals of *any* religious system and accounts for those properties.

The Principles of Superhuman Agency and Superhuman Immediacy categorize descriptions of rituals' structures that participants' action representation systems generate. At a first level of approximation, the Principle of Superhuman Agency (PSA) distinguishes between two kinds of ritual profiles--ones where CI-agents are ritually connected with the agent of a ritual and ones where they are connected with the ritual elements fulfilling one of the other two action roles. *Special agent rituals* are religious rituals in which the most direct link with the gods is through the current ritual's agent. Special agent rituals join the initial appearance of a CI-agent in the action representation with the entity fulfilling the role of the agent in the current ritual. These include such rituals as circumcisions, weddings, and funerals as well as initiations, consecrations, and ordinations. In these rituals the CI-agents are--so to speak--*in* on the action. The second kind of ritual profile concerns those rituals in which the most direct relationship with the gods is through either of the other two roles, i.e., through the patient or through the act itself (by way of an instrument). These will bind a CI-agent most directly with the items appearing in the second or third slots in the current ritual's structural description. *Special patient rituals* include sacrifices, rituals of penance, and the Eucharist. By contrast, rituals of divination and many blessings are examples of *special instrument rituals*.

The PSA concerns the character of CI-agents' involvement in a ritual. In assessing religious rituals' forms, the PSA focuses attention on the action role(s) of the current ritual that connect *most directly* with CI-agents' actions. Participants include at least one CI-agent somewhere in a ritual's full action representation, i.e., a representation that includes not only the immediate ritual but all of the enabling rituals on which it depends. The crucial question is *where* the entry for the CI-agent appears in a ritual's representation. (See figure 3.) Whether, on

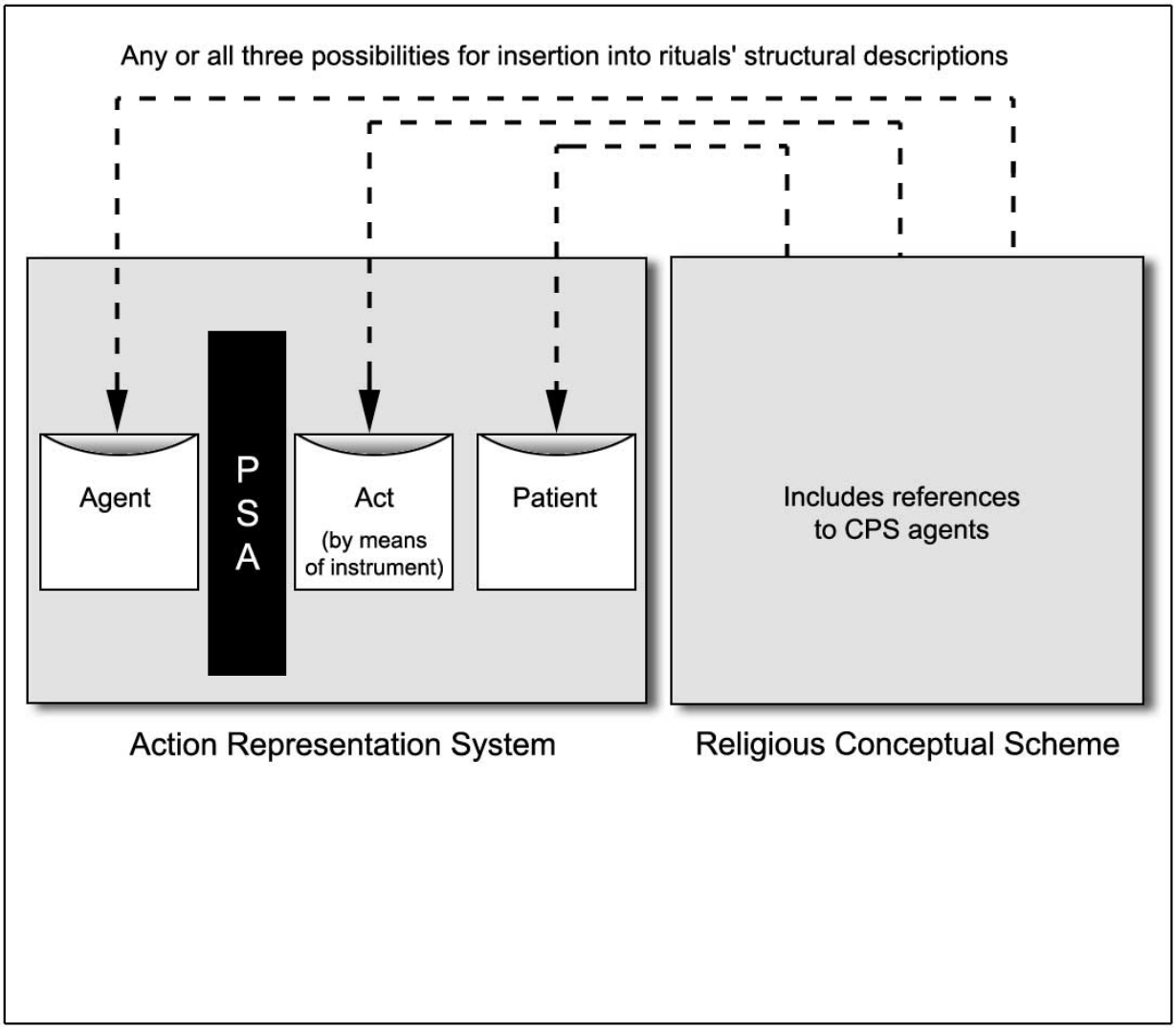

Figure 3 Principle of Superhuman Agency (PSA)

the one hand, a ritual is a special agent ritual or, on the other, a special patient or special instrument ritual determines participants' judgments about numerous ritual properties. Determining which tie to CI-agents in the representation of a religious ritual constitutes the initial entry, i.e., the entry with the "most direct connection" to some element in the current ritual, is not too complicated. This is where the Principle of Superhuman Immediacy comes in.

The Principle of Superhuman Immediacy (PSI) states that the number of enabling rituals required to associate some element in the current ritual with an entry for a CI-agent determines that entry's proximity to the current ritual. Specifically, the initial appearance of a CI-agent in a ritual's full representation is the entry whose relationship to some element in the current ritual involves the fewest enabling rituals. For example, in a Christian baptism at least the priest (the agent) and the water (the instrument) have ritually mediated attachments with God. The priest's affinity is more

direct, however, since it is mediated by fewer enabling rituals. The water engages at least one additional level of ritual mediation in order to achieve its special status, which arises, after all, because it was a *priest* who consecrated it. So, according to the PSI, since the priest, who is the *agent* who performs the baptism, has a more direct ritual link with God than the water with which he carries out this ritual, baptism is a special agent ritual.

These two principles identify two aspects of religious ritual form. They concern (1) what role(s) in the current ritual enabling rituals are associated with and (2) how many enabling rituals are required to establish that association between an element in the current ritual and a CI-agent (which we shall refer to as a ritual's "depth"). The principal sources of complexity in rituals' full action representations concern the number and locations of embedded, enabling rituals. No formal considerations set any principled limits on the possible complexity of the full action representations of rituals that the action representation system can generate, though things like memory limitations probably set some practical limitations. The PSA addresses the action *role* (agent, act, or patient) with which enabling rituals establish the most direct connection with the actions of a CI-agent. By contrast, the PSI is concerned with the *number* of enabling actions, necessary to establish such a bond. With the various concepts and principles presented above in hand, we can account for a variety of religious rituals' properties.

III. *Accounting for Various Properties of Religious Rituals*

Our comments in this section about our theory's possible ramifications for archaeology concerning the various ritual properties we address are occasional, brief, and speculative. This is the result of both limitations of space and of (our) imagination and competence.

A relationship between at least one element in the immediate ritual and the actions of CI-agents is critical to participants' assessments of both their rituals' *well-formedness* and, thus, their *efficacy*. Absent such presumptions, participants will not judge the ritual in question to be well-formed and, consequently, they will judge it as ineffective. Unless eligible agents perform correct actions on eligible patients with the right tools, participants will not judge the ritual successful. Crucially, the eligibility of at least one of the ritual participants or the suitability of a ritual instrument will depend upon enabling actions that establish ties between them and the actions of a CI-agent. If an imposter performs weddings, the couples are not validly married in the eyes of the Church. If someone switches the specially selected bones a Zulu diviner uses, this will explain the diviner's failure to predict accurately.

Considerations of the well-formedness and effectiveness of religious rituals quickly demonstrate the importance of distinguishing between special agent rituals and special patient rituals. Well-formedness is only a necessary but not a sufficient condition for the effectiveness of a special patient ritual. Well-formed rituals, presumably, get the CI-agents' attention (Renfrew, 1994b, p. 51), but while the well-formedness of ritual offerings to the ancestors is necessary for these gifts' acceptability, there is no guarantee that the ancestors will accept them. (Whitehouse, 1995) Similarly, even a casual survey reveals that the well-formedness of special agent rituals is considerably more constrained than special patient or special instrument rituals, since the former exhibit much less flexibility concerning ritual substitutions (see below).

The distinction between special agent rituals, on the one hand, and special patient and special instrument rituals, on the other, has important consequences. For example, individual participants need serve as the patients of special agent rituals only once, whereas participants can

and typically do perform special instrument and special patient rituals *repeatedly*. Consider the difference between what are (typically[8]) once-in-a-lifetime initiations and the many sacrifices that ritual participants will perform as part of their religious obligations. In special agent rituals CI-agents act, at least indirectly, through their ritually entitled middlemen. When the gods do things, they are done once and for all. By contrast, in special patient and special instrument rituals, the gods' closest associations are with the patients or the instruments of the ritual. Whatever ritually mediated connection the agent in such a ritual may enjoy with CI-agents is comparatively less intimate. Consequently, in these rituals the agents' actions carry no such finality. They are typically done again and again. Initiation into adulthood only happens once per participant, whereas participants will make offerings to the gods over and over and over.

Because the consequences of special patient and special instrument rituals are temporary only, it is unnecessary to have procedures (ritual or otherwise) for their *reversal*. Only the consequences of special agent rituals can be reversed. Defrocking priests, excommunicating communicants, expelling initiates, and dissolving marriages are all possible, but undoing Holy Communion or reversing a sacrifice is not. Only special agent rituals' consequences can be permanent, since in these it is CI-agents who have acted (usually through their intermediaries). These, then, are the only rituals whose consequences might ever need reversing.

It is not just the effects of special patient and special instrument rituals that are fleeting. That they are repeatable and that often virtually every participant repeatedly performs them signifies that nothing religiously indispensable turns on any *one* of their performances. Consequently, ritual *substitutions* often arise in these rites. Special patient and special instrument rituals are ones that human participants carry out with or on ritual elements that enjoy closer ritually established relationships with the gods than they. Nothing they do carries any lasting effects when their ritual attachments with CI-agents are less direct than are those of either the rituals' instruments or patients. Of a piece with the importance the PSA accords the role of ritual agent, the special ritual connections of instruments or patients do not override the fact that it is the ritually less-well-connected participants who perform these rites (i.e., who serve in the role of the ritual agent). These rituals' temporary effects (compared with the effects of special agent rituals) explain not only why these rituals are repeatable, but also why they often display greater latitude about their instruments, their patients, and even their procedures.

We suspect that this distinction would leave distinguishable traces in the archaeological record. Contemporary religious systems provide plenty of examples. A Muslim can use sand for a ritual washing in the desert, where water is a particularly scarce and valuable resource. Often, these rituals also permit substitutions for patients. Participants' consumption of bread and wine for the body and blood of Christ is surely the most familiar illustration, but the ethnographic literature teems with examples. Among the Nuer it is particularly auspicious to sacrifice a bull, but since bulls are valuable, a cucumber will do just fine most of the time. (Evans-Pritchard, 1956 and Firth, 1963) These rituals may even display latitude about the actual procedures involved. Humphrey and Laidlaw (1994) note, for example, that the order of ritual actions in the Puja, its frequent

[8] See the discussion of Knight (2003) below.

performance notwithstanding, has manifested a good deal of variability over relatively short spans of time.

Research by Barrett and Lawson (2001) shows that subjects find changes in agents more important to their judgments about ritual efficacy than changes in any other aspect of these rituals' structures. Special instrument and patient rituals do not guarantee what we have called "*super-permanent*" effects, i.e., putative arrangements that exceed even the spatial and temporal limits of participants' lifetimes. (Lawson and McCauley, 1990, p. 134, footnote 8) Those instruments and patients are not the agents in these rituals. Whether participants use ritually consecrated instruments or not, the primary consideration influencing subjects' judgments concerns the status of the current ritual's agent -- even when that agent's ties to CI-agents are comparatively less direct than those of the other ritual elements.

Our theory suggests three closely related trends concerning ritual substitutions. All are of a piece with the primacy that the detection of agency enjoys in the representation of action. First, substitutions will typically apply to instruments and patients -- as opposed to agents. After all, some special patient rituals (e.g., the Eucharist) even substitute for CI-agents -- but *only* when they serve as the *patient* of the current ritual, not as its agent. That substitutions turn on ritual roles as opposed to items' inherent ontological statuses is a corollary of this first point. Second, substitutions will be less likely to arise for the agents in special agent rituals -- as opposed to special patient rituals. Finally, substitutions will more commonly concern the instruments and patients of special patient rituals -- as opposed to those of special agent rituals.[9] All three predictions readily submit to both ethnographic and psychological tests. No doubt, archaeologists will be able to imagine consequences for a culture's material record as well.

The PSI clarifies which among (potentially) multiple entries for CI-agents within a ritual's full structural description is the initial one. The different structural depths of these initial entries from one ritual to the next will determine those rituals' comparative *centrality* to the overall religious system. A ritual's centrality to a religious ritual system is inversely proportional to the depth of its initial entry for a CI-agent; hence, the least central rituals are the ones with the greatest depths. The greater a ritual's depth, the more distant are its connections with CI-agents, and, thus, the less central the ritual is to the religious system.

So, for example, a baptism a Catholic priest performs is valid because he has been ritually certified by the Church, which is attached ritually to the power and authority of Christ. (A variety of different scenarios has been and can be offered to justify that link.) Since the famous doctrine of transubstantiation establishes that the bread and wine are the very body and blood of Christ, Holy Communion -- at least on orthodox Catholic views -- is a ritual that requires no appeal to enabling actions in order to locate a CI-agent.[10] The CI-agent, Christ, is involved *directly* in the ritual at hand; consequently, a representation of a CI-agent arises in the very first level of this ritual's description. Hence, the Catholic Eucharist is one of the rituals that occur at the first level

[9] Note, though, that the latter do exist and sometimes make vital contributions to the persistence of religious systems. (McCauley, 2004)

[10] . . . though it does require appeal to enabling actions in order to make sense of the substitution of the bread and wine for the body and blood of Christ. See the discussion of ritual substitution above.

of structural depth in that religious system. By contrast, the baptism's representation has no CI-agent at its surface. (It is, after all, the priest who performs the baptism, not Christ himself.) Its description requires at least two embeddings of enabling actions (perhaps more -- depending upon the preferred scenario) to establish the connection between the agent of that ritual, viz., the priest, and a CI-agent. Consequently, it falls at no less than the third level of structural depth. It follows that the theory predicts that the Eucharist is a more central ritual to Catholicism than baptism is. (It also follows that Baptists' judgments should reverse these rituals' comparative centrality.)

This technical notion of the comparative centrality of religious rituals is valuable, because it both explains and predicts a variety of psychological, social, historical, and, we suspect, archaeological aspects of religious ritual systems. Claims about rituals' comparative centrality are readily testable. Multiple independent empirical measures correlate with a religious ritual's centrality.

The most straightforward *cognitive* gauge would simply be to elicit participants' judgments about such matters. This is *not* to say that participants have explicit knowledge about this abstract property of religious rituals or even about particular rituals' (absolute) depths. They do, however, possess a reservoir of pertinent tacit knowledge. Specifically, participants can offer a wide range of judgments about the comparative importance of various rituals. (So, for example, we predicted that the behavior of confirmed Catholics, by and large, will indicate that they regard the Eucharist as more central to their religious system than baptism.) That still might prove a fairly coarse measure, though, in light of a variety of extraneous variables that could influence participants' explicit judgments (e.g., performance frequency). Consequently, it would be especially valuable to design experiments that tap this intuitive knowledge by means of indirect behavioral measures while controlling for these potentially confounding factors.

Cognition is not the only source of evidence here, though. Aspects of ritual practice should also furnish evidence about rituals' centrality. For example, participants' knowledge about ritual prerequisites generally reflects genuine constraints on ritual practice. A Hindu cannot perform abbreviated Agnyadhana rituals in his home unless he has previously participated in an initial, full Agnyadhana. An Orthodox Jew's bar mitzvah really is a necessary condition for his becoming a rabbi. These points about ritual practice are so familiar that it is easy to lose sight of their theoretical significance. Because some of these rituals are prerequisites for others, they will ordinarily prove more central to these various religious systems. When apparent exceptions occur (e.g., the Catholic Eucharist), they should be explicable in terms of the theory's principles.

According to the insider-outsider criterion, religious rituals in our theory's technical sense are those religious activities that only participants in the system may participate in. Further restrictions on participation in or, perhaps, observation of religious rituals may also correlate with rituals' centrality. Hierarchies of participant eligibility turning on previous ritual accomplishments pervade religious ritual systems. Renfrew notes, for example, that "the concept of a communal ritual does not . . . imply that participation is open to the whole community . . . The right of participation in specific rituals may be rigidly defined. Moreover, it is likely that some of the rituals carried out on behalf of the community, will be conducted by one or more designated individuals." (1985, p. 21) Participants' tolerance for variation in religious rituals is probably another measure. Presumably, that tolerance decreases with rituals' increasing centrality. History helps too. Ritual practice during periods of religious fragmentation may supply clues about rituals' various degrees of centrality. The perceived degree of upheaval within a religious system and the

probability that diverging religious communities will refuse to identify with one another any longer will surely correlate better with the addition, alteration, or deletion of a comparatively central ritual than with one that is less central. (Vial, 2004)

Finally, we presume that supplementing the theory with a few plausible hypotheses, archaeology will often be able to provide evidence here. So, for example, when groups leave multiple, disparate ritual sites, it seems a reasonable hypothesis that more central rituals will more likely occur at major ritual sites, while less central rituals will more likely occur at less major ritual sites. (See Johnson, 2004.) The locations of ritual equipment and of discards at these special locations may exhibit patterns that will offer clues about such matters. (Marcus and Flannery, 1994, p. 56) Presumably, the prominence of a ritual site will correlate with features such as size, proximity to population centers, comparative ornateness, etc., though, we defer to the archaeological professionals concerning which supplementary hypotheses to enlist.

We are not the first to have addressed these properties of religious rituals. We are, however, the first to offer a *single, unified theory that explains them all*. If our theory did nothing more than this, it should count as progress, however, the theory also explains additional properties of religious rituals that connect directly with the epidemiological considerations we raised in section I. Recall that there we emphasized how in non-literate cultures especially the need to transmit rituals acts, in effect, as a mechanism of cultural selection, imposing constraints on ritual systems that will, among other things, assure particular rituals' memorability and participants' motivation to impart this religious system and its rituals to others (typically the next generation). In these settings, public representations of culture (including rituals) that do not satisfy these criteria will, quite likely, go extinct.

In the absence of literacy, the transmission of cultural representations is a tenuous process at best. Sperber argues that what we know about the variability and vicissitudes of human memory and communication counsel that the *transformation* of cultural representations in the course of transmission is the rule and that the faithful reproduction of mental representations occurs rarely, if at all. So, he concludes that it is primarily similarities in cultural representations persisting across generations that require explanation. He holds that "resemblance among cultural items is to be explained to some important extent by the fact that *transformations tend to be biased in the direction of attractor positions in the space of possibilities*." (1996, p. 108, emphasis added) The first step, then, is to locate those attractors.

The second step, as Sperber notes, is to explain them. "*To say that there is an attractor is not to give a causal explanation*; it is to put in a certain light what is to be explained: namely, a distribution of items and its evolution, and to suggest the kind of causal explanation to be sought: namely, *the identification of genuine causal factors that bias micro-transformations*." (Sperber, 1996, p. 112, emphasis added) The causal factors on which we focus are the cognitive dispositions of the human mind and the constraints that the process of transmission imposes. Because human minds have evolved in the directions that they have and because the necessary conditions for human life (e.g., food) are what they are, some sorts of mental and cultural representations recur again and again.

We have argued at length that the two most prominent considerations that enhance the probabilities that rituals will prove memorable are their *performance frequencies* and the levels of *arousal* (primarily emotional) that they elicit. (McCauley, 1999b and McCauley and Lawson, 2002, especially chapter 2) On the one hand, frequent performance does not produce outstanding

memory for any particular instance, but it usually does insure that we develop excellent procedural memory (at least) for the routine actions we are carrying out, whether they are religious rituals or not. On the other hand, occasions of high arousal can establish particularly vivid memories about specific events. Not all do, but those that we repeatedly rehearse in memory and recount to others and that concern events whose significance we continue to recognize over long periods of time often do. The classic illustration in the psychological literature is so-called "flashbulb memories," i.e., memories for the circumstances under which people have learned about culturally significant events, such as the terrorist attacks on September 11, 2001. (Brown and Kulik, 1982) Controlled experiments indicate that the vividness and confidence subjects associate with such memories do not guarantee their accuracy. (Neisser and Harsch, 1992) *Just as in ritual*, though, *participating* in, as opposed to *observing*, a momentous event seems to have a more substantial mnemonic impact. The experimental evidence reveals that precisely when flashbulb memories are for participation in such salient events, even when they are not particularly arousing at the time (for example, experiencing a major earthquake in a comparatively safe location), subjects' memories, by contrast, seem to be every bit as vivid and as accurate as they claim. (Neisser et al., 1996)

We have argued that arousal in rituals may not be to consolidate memory so much as to signal that the ritual is significant, which, if corroborated by the artifacts in the vicinity (e.g., images of the gods and of the gods' faces) and the participant's subsequent experience, does promote improved memory. The chief means for producing arousal in rituals is to stimulate participants' senses in order to excite their emotions, however, some religious systems also employ drugs, sexual arousal, and more. (See Marcus and Flannery, 1994, p. 59 and Whitehouse 1995, pp. 110-114, respectively.) We coined the term "sensory pageantry" to cover all of these ritual measures for arousing participants. It seems reasonable to expect that the means for producing such pageantry should leave detectable traces, if not patterns, in a culture's material record. (Renfrew, 1985)

If we construct a two-dimensional space of religious ritual possibilities with the two variables we have isolated, it is not difficult to locate two attractors. See figure 4.

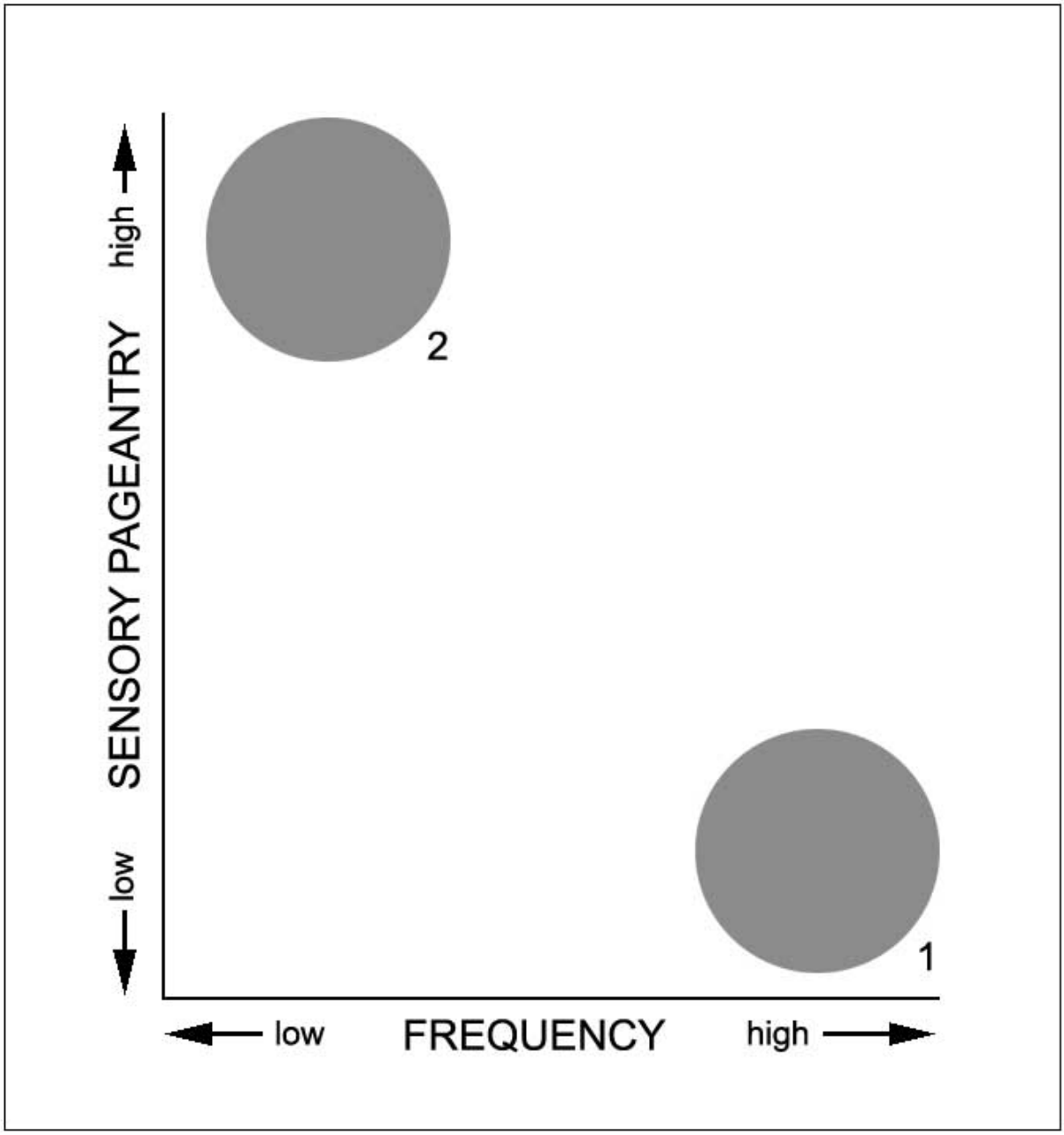

Figure 4 Two attractors

To call these regions “attractors” means that the conditions they represent are conducive to the successful transmission of rituals, where “successful transmission” means at least that participants are satisfied with the continuity in the system over time.

These two attractors mirror the paradoxical associations that most people have about religious rituals. Reflection on ritual usually produces one or both of two reactions. The first is that rituals are boring, mindless activities that we do over and over again. The second is that rituals are rare, exciting occasions in which we are the center of attention and which mark some of the most significant moments in our lives. As the two attractors signify, both, in fact, are true. The numbers of the two attractors in figure 4 correspond to these two arrangements.

Looking to the same mnemonic considerations we stress, Harvey Whitehouse (1992, 1995, and 2000) holds that performance frequency explains the different levels of sensory pageantry. This ritual frequency hypothesis proposes that the amount of sensory pageantry and, therefore, the amount of emotional arousal any religious ritual involves are inversely proportional to the frequency with which that ritual is performed. (See figure 5.) We have argued[11] that,

[11] See McCauley and Lawson, 2002, chapters 3-5. Whitehouse (2004) responds to some of these arguments. Space does not permit replies to those responses here, however, *with respect to the points of contention about the cognitive grounds of religious ritual dynamics*, as opposed to interpreting the various versions of Whitehouse's larger (interesting, but evolving) theory of religious modes, our arguments for the superiority of the ritual form hypothesis stand unscathed. We should emphasize, however, that this is a family squabble among cognitivists. Regardless of which theory proves the more successful, the cognitive approach they share has yielded comparatively precise, testable theories that have generated illuminating programs of empirical research that bear on their assessment. Demonstrating *that* is what matters most in the long run.

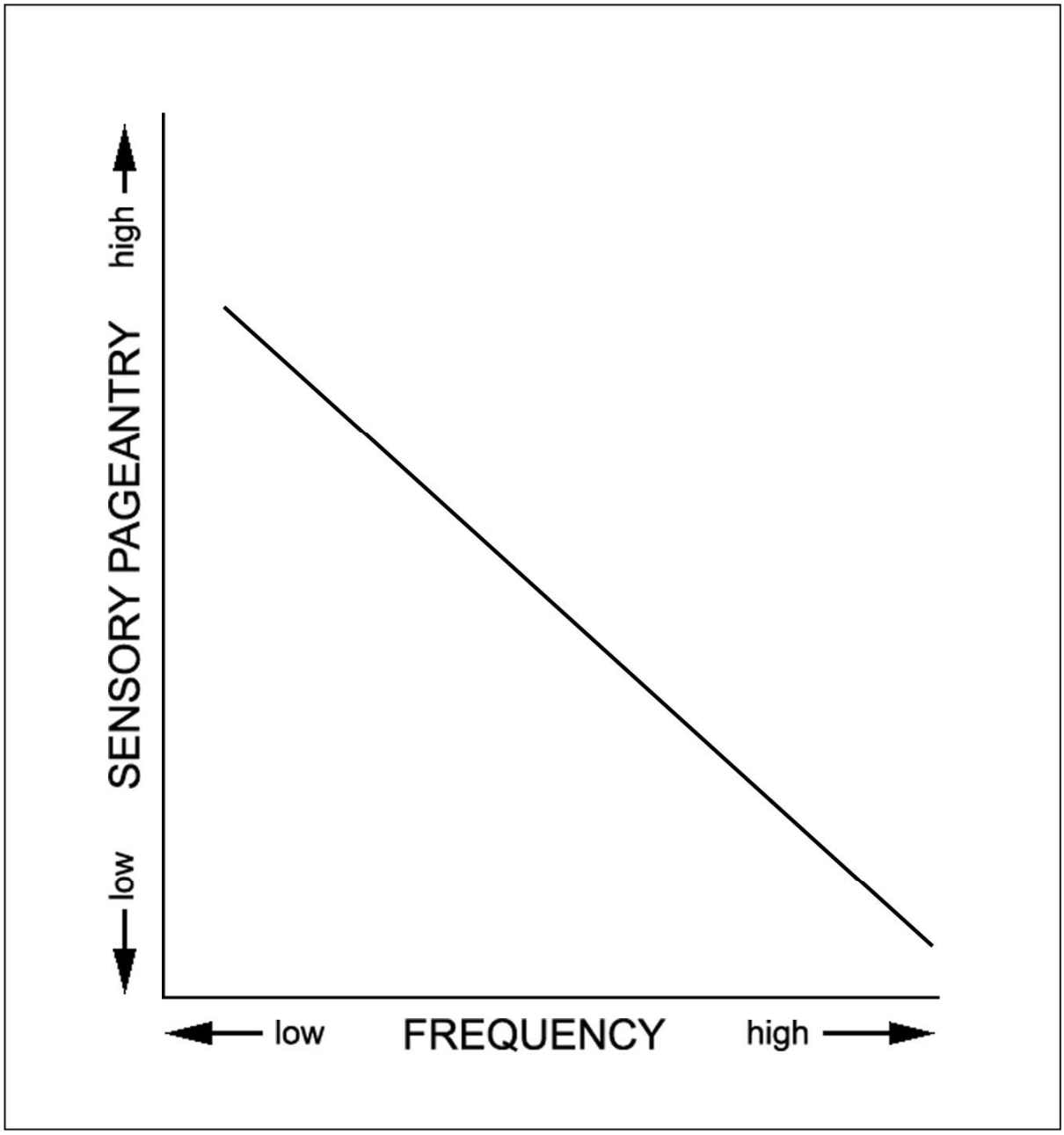

Figure 5 Ritual frequency hypothesis

although the ritual frequency hypothesis makes sense of most rituals' positions in this space (which fall at one or the other attractor), it can neither make sense of the arrangements associated

with the numerous rituals that do not fall near the line it defines, e.g., the Agnicayana (Staal, 1990; McCauley, 2001) nor does it supply *any* account of rituals' performance frequencies.

By contrast, we have advanced the *ritual form hypothesis*, a corollary of the theory of religious ritual competence. In addition to providing a finer-grained analysis that enriches the space of ritual possibilities, the ritual form hypothesis also handles the ritual frequency hypothesis' first problem, makes significant headway with the second, and explains and predicts the evolution of ritual form in ritual innovation. The ritual form hypothesis states that for all religious systems, the *comparative* levels of sensory pageantry within *particular religious communities* will never be higher in special patient and special instrument rituals than it will be in special agent rituals. This hypothesis introduces an additional (discrete) variable, viz., ritual form, which aids in explaining the two attractors. This results in a three dimensional space that offers a new perspective on both the positions of the attractors as well as the regions distant from the ritual frequency function. (See figure 6.)

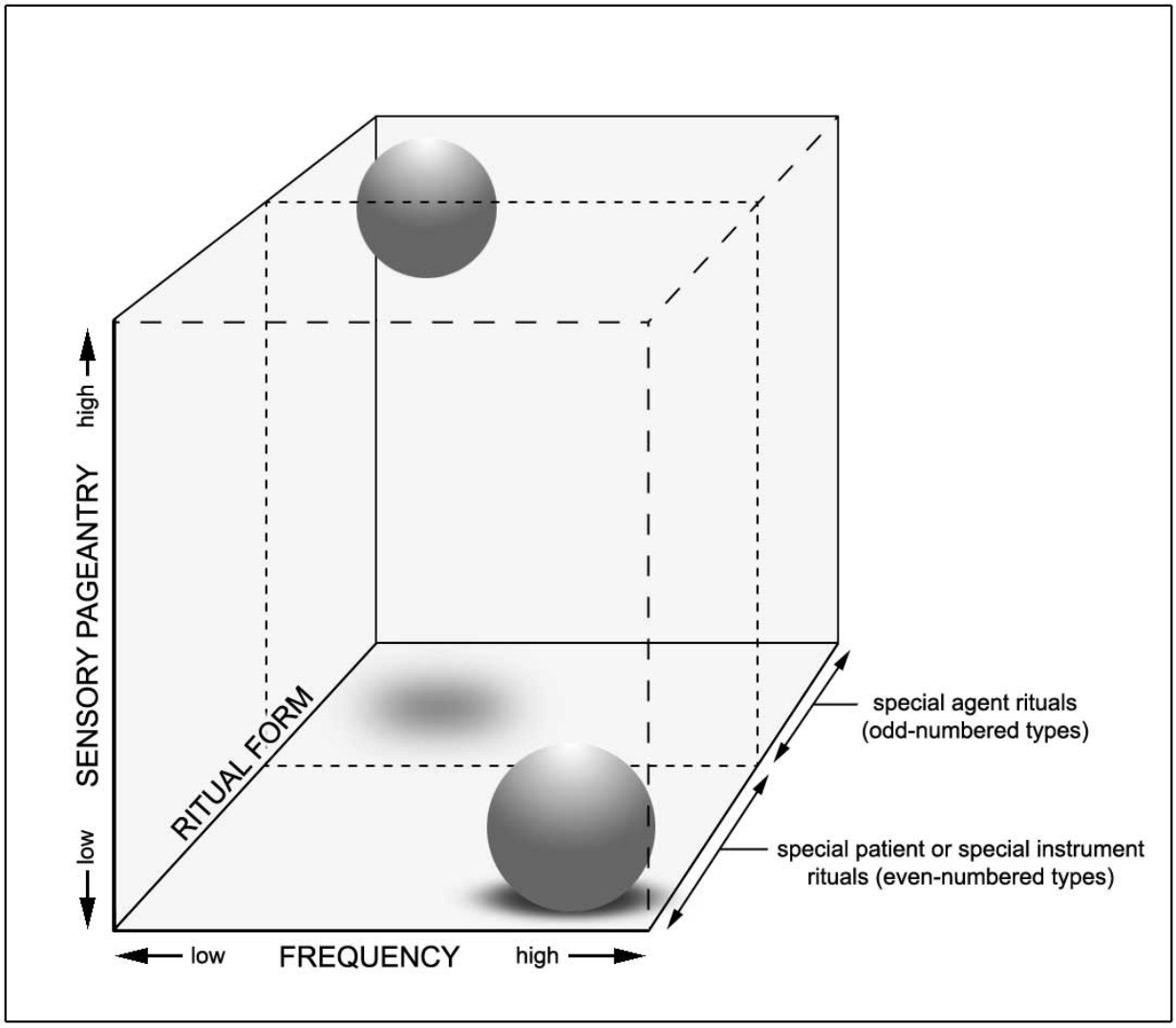

Figure 6 Ritual form as a discrete variable

As noted above, it also supplies some insight about what stands behind ritual frequencies, which the ritual frequency hypothesis leaves unaddressed. Specifically, because special patient and special instrument rituals are *repeatable* (and most are frequently repeated) whereas special agent rituals are (typically) not (see below), in highlighting ritual form the theory of religious ritual competence also isolates at least one of the variables that affects performance frequencies.

The ritual frequency hypothesis has no means for explaining any rituals that fall very far away from the line it defines.[12] (See figure 5 above.) In fact, it makes false predictions about most

[12] In the three dimensional space of possible ritual arrangements, the ritual frequency function defines a plane.

that do. Consider, for example, special patient and special instrument rituals with comparatively low performance frequencies. (See figure 7.) On the ritual frequency hypothesis,

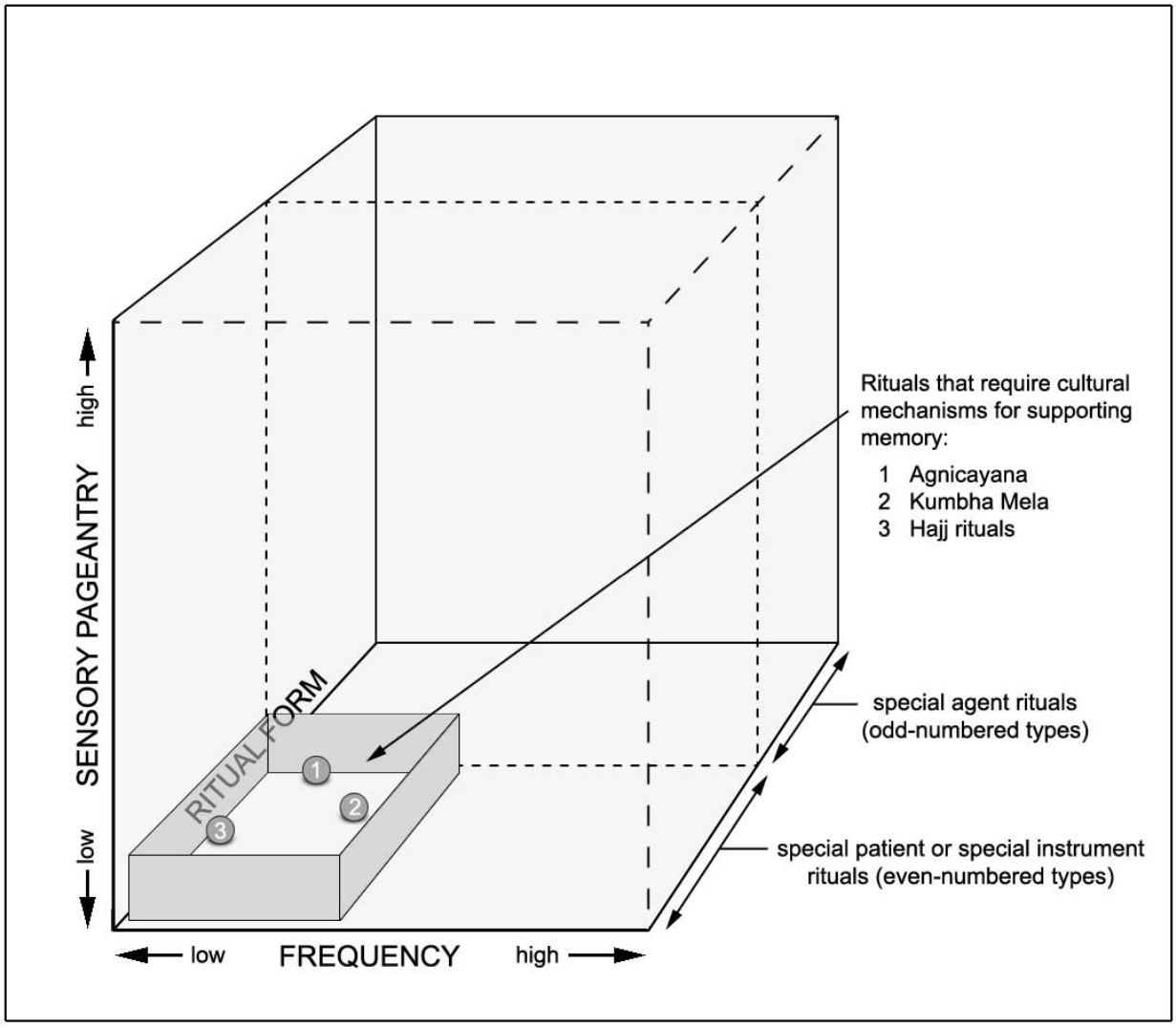

Figure 7 special patient and special instrument rituals with low performance frequencies

their low performance frequencies would require that they have *comparatively* high levels of sensory pageantry, but, in fact, they do not. (See McCauley and Lawson, 2002, pp. 146-155.) Especially in the absence of literacy, rituals that fall in this general area reliably require special cultural mechanisms for aiding their recall. Or, by contrast, ponder special agent rituals with comparatively high performance frequencies. *Prima facie*, this might seem conceptually incoherent, since we have asserted that special agent rituals are not repeated, i.e., participants are the patients of these various rituals only once. (See McCauley and Lawson, 2002, pp. 155-178 and

209.) As the forms of these rituals suggest, they are not repeated *typically*, but religions have found a variety of strategies for circumventing this apparent conceptual barrier including:

(a) limited repetition (of marriage) for some participants,
(b) juridical or ritual reversals of the effects of previously performed special agent rituals,
(c) substitutions for the patients of special agent rituals (see footnote 7 above), and
(d) determinations that earlier performances of special agent rituals failed.

Whitehouse's ethnography (1995) provides an excellent illustration of the last of these, about which the ritual form hypothesis makes correct predictions but, ironically, the ritual frequency hypothesis does not. (See McCauley and Lawson, 2002, pp. 166-178.)

This point deserves emphasis, since at least one commentator fails both to attend to these possibilities and to appreciate their theoretical significance. Chris Knight (2003) is under-whelmed by our claims that special agent rituals (or more accurately, *according to Knight*, rites of passage) are (1) non-repeated rituals and (2) ones that have comparatively high levels of sensory pageantry. He asserts that these claims are "tautologies." Since such claims are certainly not tautologies, i.e., claims, such as "a cat is a cat," which are true by virtue of their logical forms, nor are they even very good candidates for analytic truths,[13] i.e., claims that are true by virtue of the meanings of their terms, such as "a bachelor is an unmarried man," presumably, what Knight has in mind is that these are *obvious* truths (such as "dogs have four legs").

By now, though, the problem with *that* charge should be obvious. As we note above (and at length in our book), religions have found a variety of ways of eluding what Knight seems to think are conceptual necessities. Consequently, these claims, at least in their unqualified forms, are not only not obvious truths, they are not true at all (except when advanced as claims about the *implications of ritual form*, which is precisely how we advance them). We offered an extended discussion in our book of how the events described in Whitehouse's ethnography exemplify strategy (d) and of the peculiar earmarks of such cases,[14] but other examples abound. Many religions (e.g., Islam) permit multiple marriages (and weddings), illustrating strategy (a). Many also contain either ritual provisions or juridical provisions or both for reversing the effects of some special agent rituals, opening up the possibility of performing the special agent rituals again with

[13] If Knight thinks that they are good candidates, then that is only further evidence for our argument three paragraphs below.

[14] For example, unlike the repetition of special patient and special instrument rituals, repeated performances of special agent rituals with the same ritual patients as a result of the failure of an earlier performance will occasion a great deal of comment and explanation about both the need to perform the ritual again and why.

the same ritual patients, illustrating strategy (b). We offered the consecration, desacralization, and re-consecration of St. Michael's in Cambridge, England as one instance. (McCauley and Lawson, 2002, p. 157) Consider, also, the nuptial histories of various Hollywood celebrities.

Knight's preference for the category *rites of passage* over our category *special agent rituals* is precisely to *miss* the theoretical point about the explanatory prominence of the critical cognitive variable our theory isolates, viz., *participants' representations of ritual form*. It is the properties these rites share with all other special agent rituals that matter for explaining and predicting the empirical patterns we have reviewed, since, among other things, those other special agent rituals exhibit the same patterns that the classic rites of passage do. Consider, for example, the evidence of comparatively high levels of sensory pageantry that Joyce Marcus and Kent Flannery cite in association with non-repeated, "*dedicatory* offering" rituals marking the sanctification of temples among the ancient Zapotec. (1994, pp. 66, emphasis added)

The classic rites of passage, assuredly, are prime examples of special agent rituals, but they do not exhaust the category. (McCauley and Lawson, 2002, p. 19) The force of what is, by now, a substantial array of empirical evidence -- including *experimental* evidence -- that we and others have marshaled in support of our theory argues that it is by virtue of their status as *special agent rituals* that the rites manifest these patterns. To allay any skepticism as to whether these arguments, in fact, bear on the rites of passage, we note that full members of the Church of the Latter Day Saints participate as the (substitute) patients in one rite of passage repeatedly, as they undergo periodic, full immersion baptisms (as substitutes for departed ancestors), illustrating strategy (c). Unwavering insistence on the preeminence of classical categories (e.g., the rites of passage) and classical theorists and their theories (Marx, Durkheim, Turner, Rappaport, etc.)[15] can blind researchers not only to the explanatory accomplishments of alternative approaches and theories but even to *relevant facts.*[16] Recognizing the relevance of facts and discovering new facts regularly turn on exploring alternative approaches and testing new theories. This is all difficult to see, if in any particular field researchers are so convinced by their favorite theories that they regard them as the embodiment of obvious conceptual truths (let alone, tautologies).

We close with a few short comments about the ties between ritual and motivation and some of their implications for religious ritual systems overall. Under most conditions the emotional arousal wrought by the comparatively high levels of sensory pageantry in special agent rituals not only serves to flag memorable events but to increase participants' motivation and commitment to transmit the religious system. Permitting repeated participation (as the patient) in special agent rituals, therefore, is -- within limits -- likely to result in highly motivated participants eager to impart their religious representations. The dangers of habituation set limits on effective "doses" of emotional arousal and effective frequencies. Such opportunities for ritually induced arousal must occur infrequently enough that participants will not need even greater levels of arousal the next time in order to hold their interest. Violating those limits will result in an escalation of frequency and sensory pageantry until the system blows up (through what we have dubbed a

---

[15] Our here point is not to slight the categories or the theories or the theorists. We note and address positions in Lawson and McCauley (1990) of five of six individuals Knight commends.

[16] . . . like those we cite here and discuss at length in McCauley and Lawson (2002).

"sensory overload ceiling") either from the exhaustion of the resources necessary to produce these sensory effects, from the exhaustion, disability, or death of the participants, or from intervention from the outside (for example, civil authorities). (See figure 8.)

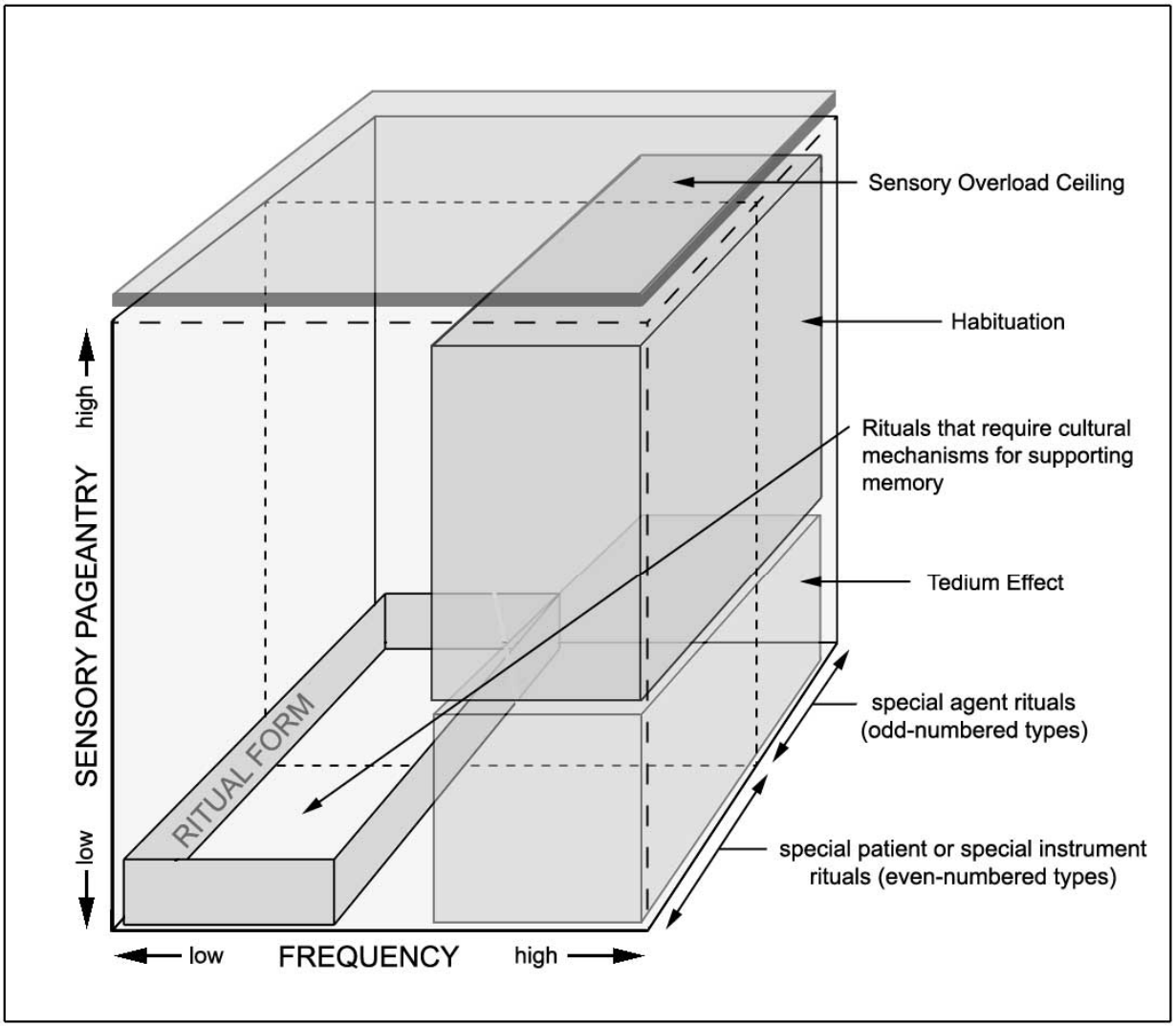

Figure 8 Psychologically problematic regions

Oddly, figure 8 indicates that psychological challenges lurk in the locale of the first attractor too. Whitehouse (1995; 2000) argues that when *all* of a religious system's rituals are clustered at the first attractor, it reliably leads to instability born of what he calls the "tedium effect." His ethnography recounts a splendid illustration. Performing rituals with little sensory pageantry day in and day out may facilitate participants' command of materials, but it also drains them of much motivation to continue in that mode.

Religions in literate cultures (or in cultures influenced by literate cultures) are usually more complicated.[17] Literacy brings advantages, such as the ability to write ritual manuals, instead of having to rely on participants' memories. It can also bring extra burdens, since "religions of the book" regularly include elaborate conceptual constructions, codified doctrines, theologies, and, probably, more rarified standards for what makes for faithful transmission of cultural representations. (Rubin, 1995) We have proposed that simultaneously assuring both participants' motivation and their facility with such conceptual materials requires that religious ritual systems include low frequency, high pageantry, special agent rituals *and* high frequency, low pageantry special patient and special instrument rituals, respectively. All else being equal, such "balanced" religious ritual systems that include rituals at *both* of the attractors in figure 6 will prove comparatively stable, since they have ritual means that address both of these requirements. (McCauley and Lawson, 2002, pp. 201-210) All of the so-called "World" religions exhibit such a pattern.

These consequences of our theory would seem to submit more readily to empirical assessment via archaeological evidence than many we have discussed. Three quick observations must suffice here. First, patterns among cultures' material remains concerning the artifacts and structured environments connected primarily with infrequently performed rituals accompanied by comparatively high levels of sensory pageantry should prove distinguishable from those connected primarily with frequently performed rituals accompanied by comparatively low levels of sensory pageantry. Because the ritual form hypothesis addresses the *comparative* levels of sensory pageantry associated with these rituals *within particular religious communities,* assessing relevant archaeological evidence will require ascertaining the local standards about what constitutes elevated levels of sensory pageantry, since these differ from one community to the next.

Second and more controversially, the material record should offer clues that the former are rituals of special agent form whereas the latter are rituals of special instrument and special patient forms. The differences would be between equipment useful for generating (comparatively)

[17] Whitehouse (2000) suggests that although religions with extensive doctrinal and ritual systems with low pageantry, high frequency rituals exist in what are basically non-literate cultures (in Melanesia), the evidence he surveys suggests that they have only arisen in response to exposure to the literacy-based, doctrinal system of missionary Christianity. Karen Johnson (2004) argues that the archaeological evidence from prehistoric Iran, viz., at Choga Mish and Susa, suggest that religions exemplifying Whitehouse's doctrinal mode can arise completely independently of literacy.

elevated levels of sensory pageantry (e.g., baptismal pools at the front of churches) and artifacts shaped and situated for regular and widespread use (e.g., votive candle holders in side chapels).

Finally, our speculations about the relative stability of such balanced systems imply that -- all else being equal -- such arrangements should contribute to the persistence of religious systems, compared, for example, to detectable variants and splinter groups that do not retain such patterns. This proposal would, among other things, encourage the calculation of correlations between two sorts of archaeological evidence, viz. between that bearing on the structures and settings of artifacts and that bearing on the persistence of particular religious systems. Across a sufficiently large stock of ritual sites, this proposal would predict (again, *ceteris paribus*) positive correlations between a religious system's longevity and evidence of it possessing a balanced ritual system in the sense discussed above. The ritual form hypothesis, in effect, suggests an avenue for discovering correlations between certain sorts of synchronic and diachronic patterns within particular bodies of archaeological evidence.

We fear, however, that this and other speculations above may reflect undue optimism about the number of available archaeological sites and about the availability, the condition, and the intelligibility of their materials. We have no doubts about the comparative range, severity, or immediacy of the difficulties associated with carrying out archaeological research.

References

Abbink, J. (1995). "Ritual and Environment: The *Mosit* Ceremony of the Ethiopian Me'en People," *Journal of Religion in Africa* 25, 163-190.

Baron-Cohen, S. (1995). *Mindblindness: An Essay on Autism and Theory of Mind*. Cambridge: MIT Press.

Barrett, J. L. and Lawson, E. T. (2001). "Ritual Intuitions: Cognitive Contributions to Judgements of Ritual Efficacy," *Journal of Cognition and Culture* 1: 183-201.

Barth, F. (1975). *Ritual and Knowledge Among the Baktaman of New Guinea*. New Haven: Yale University Press.

Barth, F. (1987). *Cosmologies in the Making: A Generative Approach to Cultural Variation in Inner New Guinea*. Cambridge: Cambridge University Press.

Bechtel, W. (1996). "What Should a Connectionist Philosophy of Science Look Like?" *The Churchlands and Their Critics.* R. McCauley (ed.). Oxford: Blackwell Publishers, pp. 121-144.

Boesch, C. and Boesch, H. (1993). "Diversity of Tool Use and Tool-Making in Wild Chimpanzees." In *The Use of Tools by Human and Non-Human Primates*. A. Berthelet and J. Chavaillon (eds.). Oxford: Clarendon Press, 158-174.

Boyer, P. (1994a). *The Naturalness of Religious Ideas*. Berkeley: University of California Press.

Boyer, P. (1994b). "Cognitive Constraints on Cultural Representations: Natural Ontologies and Religious Ideas." In *Mapping the Mind: Domain-Specificity in Culture and Cognition*. L. A. Hirschfeld and S. Gelman (eds.). New York: Cambridge University Press, 391-411.

Boyer, P. (1996). "Cognitive Limits to Conceptual Relativity: The Limiting Case of Religious Categories," *Rethinking Linguistic Relativity*. J. Gumperz and S. Levinson (eds.). Cambridge: Cambridge University Press, 203-231.

Boyer, P. (1999). "Cultural Inheritance Tracks and Cognitive Predispositions: The Example of Religious Concepts," *Mind, Evolution, and Cultural Transmission.* H. Whitehouse (ed.). Cambridge: Cambridge University Press.

Boyer, P. (2001). *Religion Explained*. New York: Basic Books.

Brown, R. and Kulik, J. (1982). "Flashbulb Memories," *Memory Observed*. U. Neisser (ed.). San Francisco: W. H. Freeman and Company.

Clark, A. (1997). *Being There: Putting Brain, Body, and World Together Again.* Cambridge: MIT Press.

Day, M. (2004). "Religion, Off-Line Cognition and the Extended Mind," *Journal of Cognition and Culture* 4, 101-121.

Day, M. (forthcoming). "The Ins and Outs of Religious Cognition," *Method and Theory in the Study of Religion*.

Donald, M. (1991). *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition*. Cambridge: Harvard University Press.

Evans-Pritchard, E. (1956). *Nuer Religion*. Oxford: Clarendon Press.

Firth, R. (1963). "Offering and Sacrifice: Problems of Organization," *Journal of the Royal Anthropological Institute 93,* 12-24.

Humphrey, C. and Laidlaw, J. (1994). *The Archetypal Actions of Ritual*. Oxford: Oxford University Press.

Hutchins, E. (1994). *Cognition in the Wild*. Cambridge: MIT Press.

Johnson, K. (2004). "Primary Emergence of the Doctrinal Mode of Religiosity in Prehistoric Southwestern Iran." In *Theorizing Religions Past: Archaeology, History, and Cognition.* Whitehouse, H. and Martin, L. (eds.). Walnut Creek, CA: Alta Mira Press, 45-66.

Knight, C. (2003). "Trauma, Tedium and Tautology in the Study of Ritual," *Cambridge Archaeological Journal 13,* 293-295.

Lawson, E. T. and McCauley, R. N. (1990). *Rethinking Religion: Connecting Cognition and Culture*. Cambridge: Cambridge University Press.

Leslie, A. (1995). "A Theory of Agency," in *Causal Cognition: A Multidisciplinary Debate*. D. Sperber, D. Premack, and A. J. Premack (eds.). New York: Oxford University Press, 121-147.

Malley, B. and Barrett, J. (2003). "Can Ritual Form Be Predicted From Religious Belief? A Test of the Lawson-McCauley Hypotheses," *Journal of Ritual Studies* 17, 1-14.

Marcus, J. and Flannery, K. V. (1994). "Ancient Zapotec Ritual and Religion: An Application of the Direct Historical Approach," *The Ancient Mind: Elements of Cognitive Archaeology.* C. Renfrew and E. B. W. Zubrow (eds.). Cambridge: Cambridge University Press, pp. 55-74.

McCauley, R. N. (1999a). "The Cognitive Foundations of Religion and Science," *Religion im Wandel der Kosmologien*. D. Zeller (ed.). Berlin: P. Lang, 55-67.

McCauley, R. N. (1999b). "Bringing Ritual to Mind," *Ecological Approaches to Cognition: Essays in Honor of Ulric Neisser*. E. Winograd, R. Fivush, and W. Hirst (eds.). Hillsdale, New Jersey: Erlbaum, 285-312.

McCauley, R. N. (2000a). "The Naturalness of Religion and the Unnaturalness of Science," *Explanation and Cognition*. F. Keil and R. Wilson (eds.). Cambridge: MIT Press, pp. 61-85.

McCauley, R. N. (2000b). "Overcoming Barriers to a Cognitive Psychology of Religion," *Method and Theory in the Study of Religion* 12, pp. 141-161. (special issue) *Perspectives on Method and Theory in the Study of Religion*. A. Geertz and R. McCutcheon (eds.). The Hague: Brill.

McCauley, R. N. (2001). "Ritual, Memory, and Emotion: Comparing Two Cognitive Hypotheses," *Religion in Mind: Cognitive Perspectives on Religious Experience*. J. Andresen (ed.). Cambridge: Cambridge University Press, pp. 115-140.

McCauley, R. N. (2004). "Four Ways of Achieving Stability in Religious Ritual Systems," Midwest American Academy of Religion, DePaul University, Chicago, IL.

McCauley, R. N. and Lawson, E. T. (2002). *Bringing Ritual to Mind: Psychological Foundations of Cultural Forms*. Cambridge: Cambridge University Press.

Michotte, A. (1963). *The Perception of Causality*. Andover: Metheun.

Mithen, S. (1996). *The Prehistory of the Mind*. London: Thames and Hudson.

Mithen, S. (1997). "Cognitive Archaeology, Evolutionary Psychology and Cultural Transmission, with Particular Reference to Religious Ideas," *Rediscovering Darwin: Evolutionary Theory and Archaeological Explanation*. C. Michael Barton and Geoffrey A. Clark (eds.). Arlington, VA: American Anthropological Association.

Neisser, U. and Harsch, N. (1992). "Phantom Flashbulbs: False Recollections of Hearing the News about *Challenger*," *Affect and Accuracy in Recall*. E. Winograd and U. Neisser (eds.). New York: Cambridge University Press.

Neisser, U., Winograd, E., Bergman, E., Schreiber, C., Palmer, S., and Weldon, M. S. (1996). "Remembering the Earthquake: Direct Experience vs. Hearing the News," *Memory* 4, 337-357.

Penner, H. (1975). "Creating a Brahman: A Structural Approach to the Study of Religion," *Methodological Issues In Religious Studies*. R. Baird (ed.). Chico: New Horizons Press.

Perner, J. Leekam, S. R., and Wimmer, H. (1987). "Three-Year-Olds' Difficulty with False Belief," *British Journal of Developmental Psychology*, 5, 125-137.

Renfrew, C. (1985). *The Archaeology of Cult: The Sanctuary at Phylakopi*. Supplementary Volume 18. London: The British School of Archaeology at Athens and Thames and Hudson.

Renfrew, C. (1994a). "Towards a Cognitive Archaeology," *The Ancient Mind: Elements of Cognitive Archaeology*. C. Renfrew and E. B. W. Zubrow (eds.). Cambridge: Cambridge University Press, pp. 3-12.

Renfrew, C. (1994b). "The Archaeology of Religion," *The Ancient Mind: Elements of Cognitive Archaeology*. C. Renfrew and E. B. W. Zubrow (eds.). Cambridge: Cambridge University Press, pp. 47-54.

Renfrew, C. (1998). "Mind and Matter: Cognitive Archaeology and External Symbolic Storage," *Cognition and Material Culture: The Archaeology of Symbolic Storage*. Renfrew, C. and Scarre, C. (eds.). Cambridge: McDonald Institute for Archaeological Research, pp. 1-6.

Renfrew, C. and Scarre, C. (eds.) (1998). *Cognition and Material Culture: The Archaeology of Symbolic Storage*. Cambridge: McDonald Institute for Archaeological Research.

Rochat, P. (2001). *The Infant's World*. Cambridge: Harvard University Press.

Rubin, D. (1995). *Memory in Oral Tradition: The Cognitive Psychology of Epic, Ballads, and Counting-Out Rhymes*. New York: Oxford University Press.

Slone, J. (2004). *Theological Incorrectness: Why Religious People Believe What They Shouldn't*. New York: Oxford University Press.

Sperber, D. (1975). *Rethinking Symbolism*. A. Morton (Trans.). Cambridge: Cambridge University Press.

Sperber, D. (1996). *Explaining Culture: A Naturalistic Approach*. Oxford: Blackwell Publishers.

Staal, F. 1990. *Rules Without Meaning: Ritual, Mantras, and the Human Sciences*. New York: Peter Lang.

Tooby, J. and Cosmides, L. (1992). "The Psychological Foundations of Culture," *The Adapted Mind*. J. Barkow, L. Cosmides, and J. Tooby (eds.). New York: Oxford University Press, 19-136.

Vial, T. (2004). *Liturgy Wars: Ritual Theory and Protestant Reform in Nineteenth-Century Zurich*. London: Routledge.

Wellman, H. (1990). *The Child's Theory of Mind*. Cambridge: MIT Press.

Whitehouse, H. (1992). "Memorable Religions: Transmission, Codification and Change in Divergent Melanesian Contexts," *Man* (N.S.) 27, 777-797.

Whitehouse, H. (1995). *Inside the Cult: Religious Innovation and Transmission in Papua New Guinea*. Oxford: Clarendon Press.

Whitehouse, H. (2000). *Arguments and Icons: The Cognitive, Social, and Historical Implications of Divergent Modes of Religiosity*. Oxford: Oxford University Press.

Whitehouse, H. (2004). *Modes of Religiosity: A Cognitive Theory of Religious Transmission.* Walnut Creek, CA: Alta Mira Press.

Whitehouse, H. and Martin, L. (eds.). (2004). *Theorizing Religions Past: Archaeology, History, and Cognition.* Walnut Creek, CA: Alta Mira Press.

Wimmer, H. and Perner, J. (1983). "Beliefs about Beliefs: Representations and Constraining Function of Wrong Beliefs in Young Children's Understanding of Deception." *Cognition* 13, 103-128.