



Long-Term, Explicit Memory in Rituals

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Abstract

This article reconsiders the problem of memorization in rituals in light of recent empirical work in memory research. Four hypotheses are put forward in particular: (1) Emotionally laden details will enhance the formation of memories about any detail of the ritual; (2) harsh sensory stimuli will function as attention-magnets, resulting in increased memorization of the stimuli at the cost of remembering other elements of the ritual; (3) the self-relatedness of a ritual will enhance the formation of memories about the ritual, although the positive effect might be limited to details that are self-related; and (4) stress can be understood to function as a “zoom,” limiting the range of details remembered. The effects of stress will be modulated by gender differences and the timing of the ritual within the circadian cycle. The consequences of the four hypotheses are compared with the predictions of the Modes Theory and the Ritual Form Theory.

Keywords

Ritual theory, long-term memory, emotional salience, stress, self-relatedness

This article assesses the potential of hitherto neglected empirical findings about factors influencing the formation of long-term memories for the research of memorization in rituals. I will deal, in particular, with thematically arousing details, salient visual stimuli, stress, and self-relatedness. In terms of the formation of memories in rituals, my interest will be limited to long-term, explicit memories created during the ritual itself. In this essay I will therefore not discuss implicit (non-declarative) memory, such as procedural memory about the performance of ritual actions (Whitehouse, 2004: 87). For the moment we also set aside the question of how rituals affect working memory (Boyer and Liénard, 2006). First, I will summarize what the two major cognitive theories of ritual have to say about the formation of long-term, explicit memories. Second, I will discuss empirical research about

memorization that has not yet been considered in this context. Third, I will put forward four hypotheses and examine their implications for the existing cognitive theories of ritual.

Cognitive Theories about Long-Term Memory in Rituals

In recent years, two important cognitive theories of religion dealt with the effects of rituals on long-term memory. Since both theories have been reviewed in various publications, it will suffice to summarize them in a nutshell. Whitehouse (1995) documented the rise and fall of a reform-movement within a syncretistic religion in Papua New Guinea. The history of the splinter group of the Pomio Kivung movement was marked by a series of emotionally laden rituals, which intended to elicit the eschatological return of the ancestors of the villages. Whitehouse's (1995, 2000, 2004) theory describes two modes of religiosity by means of fourteen variables. In the imagistic mode, emotionally charged, high-arousal rituals are repeated with low frequency. Movements that operate in the imagistic mode have a non-centralized social structure, and their rituals have spontaneously generated, non-standardized meanings. In the doctrinal mode, of which the original Pomio Kivung movement is an example, emotionally not-so-arousing rituals are repeated frequently. In this mode, the religious group is centralized and its theology is fixed and elaborated. Whitehouse suggested that rituals in the imagistic mode influence episodic memory, whereas rituals in the doctrinal mode influence semantic memory. Since the 1970s, psychologists have made a distinction between two memory systems: episodic memories record singular events of our lives (e.g., "yesterday I flew from Helsinki to Rome"), whereas semantic memories are lexical items without reference to singular events in our lives (e.g., "Finland is in Europe"). Whitehouse also suggested that highly arousing rituals generate flashbulb memories. Flashbulb memories (Brown and Kulik, 1977) are memories for the circumstances in which we first learned about emotionally arousing events (public news in the original theory). For example, most people remember what they were doing on nine-eleven, but not what they were doing the day before (e.g., Curci and Lanciano, 2009). Whitehouse (2004: 106) emphasized especially the "photograph-like vividness" of flashbulb memories. In sum, infrequent but highly arousing rituals generate episodic or flashbulb memories (such as vivid memories of the events that occurred during an initiation rite), whereas frequent but emotionally less salient rituals generate semantic memories (such as knowledge about mythology).

Another ritual theory that deals with memory extensively, partly in reaction to Whitehouse's work, is McCauley and Lawson's (2002) Ritual Form Theory. In the Ritual Form Theory, building on Lawson's and McCauley's earlier work on the mental representation of rituals (Lawson and McCauley, 1990) there is a single independent variable that determines how frequently a ritual will be performed and what kind of memories it will generate. What we have to know about a ritual in order to understand it is how the supernatural agent (the deity) is involved in the mental representation of the ritual. It has to be noted that the ritual form theory (McCauley and Lawson, 2002: 14) deals only with rituals that bring about changes in the world: if this does not happen, we can speak of a "religious act" rather than a religious ritual. In the Ritual Form Theory there are two major types of rituals. On one hand, if the deity is associated with the agent of the ritual (for example, the initiator in an initiation rite), the effects of the ritual (for example, the new status of the initiate) will be final (or "superpermanent," according to the authors' terminology). Such special agent rituals are, therefore, not repeated normally, and it is due to their major importance in an individual's life that they generate exceptional emotional response and are remembered as episodic memories. On the other hand, if the deity is more intimately associated with another element of the ritual than its agent (such as Jesus is associated with the elements of the Eucharist more directly than with the believers who eat them), the ritual will not result in final effects and will be repeated over time. Also McCauley and Lawson (2002: 38) mention flashbulb memories and hypothesize that emotionally arousing events result in accurate memories of the relevant details of the event, especially if the importance of the event is vindicated by subsequent experience.

A detailed comparison of the two theories is not the task of this essay. Let us only note that many rituals that are important for the modes theory, due to their effect on semantic memory (such as sermons that facilitate the memorization of doctrines), are simple religious acts and not rituals according to the ritual form theory. Now let us turn to the explanations that the two theories offer for the generation of long-term memories in rituals, adding some details not yet mentioned in our review. (1) Some rituals generate episodic memories. In the modes theory, this is due to the high sensory stimulation in some rituals, whereas in the ritual form theory, this follows from the salient significance of special-agent rituals. Memories of such rituals are often stored as flashbulb memories. (2) Other rituals generate semantic memories. In the Modes Theory, frequently repeated, often boring rituals guarantee that believers remember the theological details of religions. In the ritual form theory,

this happens in a more limited set of rituals, ones that have to be repeated due to their short-lived effects. (3) Whitehouse (2004: 87) adds that in the doctrinal mode rituals themselves are represented in non-declarative memory (that is, the memory system for emotions, attitudes and habits) as routinized sequences of motions. (4) Whitehouse (2004: 29) also argues that some religious ideas (such as beliefs in spirits) are so attractive that they spread naturally (e.g., due to their minimally counterintuitive features), without the assistance of rituals. Such knowledge is also stored in semantic memory. (5) Finally, Whitehouse (2004: 69), as well as McCauley and Lawson (2002: 146), mention that literacy changes the situation in the sense that a great deal of knowledge about religion and ritual is handed down by other means than by the rituals themselves. Whereas it could be argued that the importance of memory is by no means eliminated in literate transmission (e.g., Czachesz, 2010a,b), in this essay we do not deal with the problem of literacy.

New Insights from Memory Studies

Recent empirical findings in memory research allow us to move beyond the simplistic and debated distinction between semantic and episodic memories, as well as the general idea of “emotional arousal,” and give a more nuanced account of what is remembered in rituals and why. The notion of episodic memory – a dominant, although not universally accepted, notion in psychological research – has undergone an important metamorphosis in the last few decades (Greene, 2004). Most importantly, whereas in his early work Tulving (1972) focused on two kinds of information (personal experiences versus general facts) and two separable memory systems (1983), in his recent work (2002) “episodic” often refers to the subjective experience of the rememberer when recollecting past events:

Retrieving information from episodic memory (remembering or conscious recollection) is contingent on the establishment of a special mental set, dubbed episodic “retrieval mode.” Episodic memory is subserved by a widely distributed network of cortical and subcortical brain regions that overlaps with but also extends beyond the networks subserving other memory systems. The essence of episodic memory lies in the conjunction of three concepts – self, autooetic awareness, and subjectively sensed time. (Tulving, 2002: 5)

Since ritual theories are mainly interested in how rituals influence the encoding of memories (which is also in the focus of this essay), a theory that explains retrieval is less helpful for them. Not that the retrieval of memories were an unimportant subject for explaining religion: for example, how the

mind organizes narratives and how we retrieve their details from memory is extremely relevant for religiosity. Empirical research supplies interesting data in that regard (Hassabis and Maguire, 2007). Even if we return to the earlier definition of episodic memory, however, we bump into a difficulty regarding the empirical verification of an episodic memory system, which is a serious challenge for the use of the concept in ritual theories. As recent critical reviews of the subject have shown, neither neuroscientists (Eichenbaum, 2002: 100) nor psychologists (Roediger, 2008) have been able to dissociate a “semantic” memory system from an “episodic” one convincingly. Moving beyond the issue of episodic memory, it seems that the effect of sensory stimulation and emotional arousal on memory also needs to be handled in a more nuanced way in the study of rituals than it has been done so far. Finally, both the modes theory and the ritual form theory refer to flashbulb memories. It is, however, questionable whether research on memories generated about the circumstances of learning about public news is suitable to explain the effect of rituals on participants’ memories. A somewhat different understanding of flashbulb memory underlay the study of U. Neisser and his colleagues (Neisser et al., 1996), when they followed up the consolidation of memories about a Californian earthquake (1989) in participants of the event (comparing it with the memories of people living in Atlanta). Their main finding – also discussed in McCauley and Lawson (2002: 59) – that narrative rehearsal consolidates memories suggests the importance of social-psychological factors that govern reflections on rituals in a group – such factors, however, are not dealt with in the present essay. In sum, the kinds of emotional stimuli in rituals and their effects on memory are more variegated than it has been recognized before.

Let us start our discussion of recent empirical findings with the effect of thematically arousing events on memory (Laney et al., 2004). In an experiment, students who listened to a story with emotionally arousing details (a date rape) remembered both the essence of the story and its details better than students who listened to an emotionally neutral version of the narrative. Both groups of students were also watching a slide show while listening to the story. Memories of the slide show were stronger when students listened to the emotionally arousing version of the story, also when the slides shown during both versions were identical. We can also observe a flashbulb effect in the experiment: the addition of emotionally arousing details enhances the memorability of various other details that are not emotionally arousing. These empirical findings support the hypothesis (Czachesz, 2007, 2010a,b) that emotionally laden motifs (such as suffering, martyrdom, or extreme need) facilitate the spread of the episodes in which they occur in the

transmission of religious narratives. Rituals that involve the recitation of emotionally arousing narratives (such as the recitation of historical or mythological narratives during festivals) might have a similar effect on the memory of believers.

Much empirical work has been dedicated to the effect of emotionally salient visual stimuli on memory. For example, subjects were shown the photographs of seriously injured or mutilated victims (Burke et al., 1992; Cahill and McGaugh, 1995; Adolphs et al., 2000), or spider phobics were shown living spiders in the lab (Öhman and Soares, 1994). Such experiments yielded the result that emotional arousal leads to improved memories about central details, such as the appearance of the main actors and objects, whereas details that were not linked to the main actors and objects or were physically in the background were significantly less well remembered. One example of this mechanism is the widely discussed weapon-focus effect (Stebly, 1992): victims of armed violence tend to focus on the weapon and fail to remember other details, such as the face of the attacker. Not only a weapon but also other shocking visual details (Laney et al., 2004) might serve as attention magnets. Thus, surprising and shocking visual stimuli result in a very different effect on memory than emotionally arousing details in narratives do. In the presence of a shocking visual stimulus, the central image is well-remembered, but most of the circumstantial details are lost. If rituals expose initiates to shocking images, the effect of the scene on memory might be just the opposite of what is predicted by the flashbulb hypothesis. For example, Livy (10.38) reports that during the initiation of the warriors of the Samnites (living in Southern-Central Italy in antiquity), initiates were suddenly faced with dead bodies and weaponed soldiers before taking an oath during the ceremony: in this ritual, the initiate probably remembered the horrific elements, and not other details, such as the oath taken.

Instead of focusing exclusively on the effect of emotional arousal, it is rewarding to include in the cognitive study of rituals empirical findings about other relevant factors influencing memorization. The concept of stress grasps a whole matrix of environmental conditions affecting the organism in a more complex manner than “sensory stimulation.” The response of the organism to stress is measured by physiological parameters, particularly changes in the endocrine system, providing quantitative data that is more difficult to acquire about “emotions” or “arousal.” The latter might or might not be included in the organism’s response to stress. Initiation rites could be especially understood as stressful events. The endocrinologist Hans Selye (1936) defined stress as an intersection of symptoms in reaction to a variety of noxious agents. There are physical (such as heat, cold, pain) as well as psychological stressors

(such as stressful situations). In human experiments (Lupien et al., 2007), emotions are normally induced by images or stories of the sort that we have discussed above, whereas stress is induced by stressful situations, for example ones involving novelty, uncertainty, or a speaking assignment. How stress affects memory depends on a number of circumstances, such as the age and sex of the individual, the hour of the day when stress occurs, the sequential order of stress and memorization, and the nature of the material to be remembered. An important and widely supported finding (Lupien et al., 2007: 222) is that stress enhances memory for emotionally laden material, whereas it negatively affects memory for emotionally neutral material. We have seen above that memory for all details was better if stories included emotionally arousing elements, but the weapon-focus effect was dominant when emotions were elicited by a sudden visual stimulus. The effect of stress on memory is similar to the latter pattern inasmuch as it makes memorization selective. If a strong visual stimulus and stress occur simultaneously, one might expect an especially sharp limit to the amount of details remembered, such as seen in the weapon-focus effect. Stress in rituals might be sustained for a long time, such as in initiation rites that span over several days, which are both attested in ethnographic studies (Barth, 1975; Vidal, 1976) and implied by ancient sources (Bacchanalia in Livy 39.8–19; Paul's conversion in Acts 9; initiation to the Isis cult in Apuleius, *Metamorphoses* 11). We can hypothesize that in such rituals stress will limit the memories of the initiate to emotionally laden elements, such as strong visual stimuli, main actors and objects, emotionally salient details of liturgical texts, and one's own fear and emotions. As we have mentioned above, the effect of stress on memory is further differentiated by a number of factors. First, there are gender-related differences in the range or stressors, in men's and women's respective ways of dealing with stress, and the long-term effects of stress on each gender (Taylor et al., 2000; Mazure and Maciejewski, 2003; Smeets et al., 2009). In general, women are sensitive to more stressors, and although they have more efficient means to deal with stress than men do, they are more often affected by depression. A study of gender differences with regard to emotional effects on memory revealed that individuals (both men and women) with more male-related behavioral traits (measured as male-related scores on the Bem Sex-Role Inventory) show better memory for the central elements of an emotionally laden story, whereas individuals with female-related behavior remember marginal details better than central features. Second (Lupien et al., 2007: 223), it has been suggested that stress in the early morning hours affects memory negatively, whereas in the afternoon hours it might even increase memory, which is explained by the natural fluctuation of the level of

stress-hormones (particularly glucocorticoids) in the body during the day/night (circadian) cycle.

Yet another factor that has to be mentioned is not directly related to emotions and stress. A number of empirical studies (Symons and Johnson, 1997; Cloutier and Macrae, 2008) have shown that items related to the self are remembered better than items not related to the self. For example, subjects better remembered words that they thought to describe them well, than words without such self-reference (Rogers et al., 1977). Recently it has been found (Cloutier and Macrae, 2008) that self-relatedness rather than self-reference is enough to enhance memory. In an experiment, subjects alternately selected numbers which the experimenter matched with a list of words, uttering the word that was linked with the number. Subjects better remembered the words linked to numbers they selected than words linked to numbers that another subject selected. This finding is related to the well-documented observation that ownership (even if it is artificially induced in an experiment) makes things special, valuable and attractive. The experiment demonstrates that actions (and circumstances of actions) of which we are agents are remembered better than the actions of others, as well as their results are monitored and memorized better than the results of other people's actions. The memory effects of self-relatedness might have two different implications for memory in rituals. First, people might form stronger memories of rituals that they undergo voluntarily than of rituals to which they are subjected by the rules of their societies. For example, all else being equal, the details of voluntarily chosen baptism or an initiation to a mystery are probably better remembered than obligatory initiation rites marking adulthood. Second, if an individual sees himself or herself as the agent of a ritual, he or she might remember it better than an individual who is the recipient of a ritual, such as the initiate of an initiation rite. In sum, being subjected involuntarily to a ritual seems the worst scenario in terms of the effect of self-relatedness on memory, whereas voluntarily taking an active role in a ritual is the optimal scenario. Self-relatedness might be also enhanced by learning: for example, learning about the significance of baptism or another initiation rite for oneself might enhance its self-relatedness and therefore its memorability.

Long-Term Memory in Rituals: Hypotheses and Implications

Proceeding from the empirical findings about memory reviewed in the previous section, we can now put forward four hypotheses about the formation of long-term, explicit memory in rituals.

(1) First, emotionally laden details enhance the formation of memories about any detail of the ritual. Thematically arousing elements have a flashbulb effect, that is, they also facilitate the memorization of details of the ritual that are not emotionally laden.

(2) Second, shocking visual stimuli, and possibly also other harsh sensory stimuli, will function as attention magnets, resulting in increased memorization of the stimuli at the cost of remembering other elements of the ritual.

(3) Third, the self-relatedness of a ritual means that an individual sees himself or herself as the agent of the ritual, or otherwise voluntarily decides to undertake the ritual. Learning about the significance of the ritual for the participant might be yet another way of creating self-referentiality. Self-relatedness enhances the formation of memories about the ritual, although the scope of memories has not yet been examined in this context. The positive effect of self-relatedness might be limited to details that are self-related, excluding other details.

(4) Fourth, stress can be understood to function as a “zoom” that limits the range of details remembered. Under stress, subjects have enhanced memories of vivid sensory stimuli as well as emotionally laden elements, but limited memories about other details. The memory effects of stress can be further modulated by gender-related differences and the timing of the ritual within the circadian cycle: male and female participants have different memories about the same ritual; stress in rituals performed in the afternoon can have beneficial effects on memorization.

Finally, we can consider how these hypotheses influence the modes theory and the ritual form theory. The modes theory predicts the formation of vivid episodic memories during emotionally arousing rituals, resulting in the (idiosyncratic) transmission of religious beliefs and information about the rituals. In terms of our hypotheses, at least three different forms of stimulation have to be considered.

(a) Some rituals contain thematically arousing details (rather than shocking sensory stimuli), including various forms of sacrifice, theater play, recitation, music, and other religious art. Thematically arousing details (hypothesis 1) in the absence of stress (hypothesis 4) will produce a flashbulb effect. For example, attendees of such rituals will remember both the details of the ritual and the mythological narratives that are recited or enacted in the ritual, and take home messages regarding the moral significance of the stories. Such rituals are suitable for the (relatively) faithful transmission of religious doctrines and narratives – which seems to contradict the prediction of the modes theory that such transmission only occurs in the doctrinal mode, motivated by frequent repetition rather than emotional arousal.

(b) Shocking visual stimuli (and possibly other harsh sensory inputs, as well), in contrast, will function as attention magnets (hypothesis 2), resulting in vivid memories of the particular stimuli at the cost of remembering other details. An attention magnet produces the opposite effect of a flashbulb: participants exposed to such stimuli are unlikely to preserve explicit memories of the details and circumstances of the ritual.

(c) Putting participants under stress by physical (cold, heat, pain) or psychological (isolation, threats, novel situation) stressors will enhance the power of attention-magnets (if such are present) and decrease the chance of remembering the details and circumstances of the ritual (hypothesis 4). Thematically arousing details will lose their flashbulb effect and will be remembered without their context. Stressful rituals are thus suitable for the transmission of neither religious doctrines nor the details of a ritual, but might enhance the memorization of some central imagery or emotional content of the tradition.

What happens if one increases the frequency of rituals? According to the modes theory, this leads to the tedium effect, that is, “reduced levels of motivation” to remember doctrines and narratives (Whitehouse, 2000: 44, 2004: 66). The effects of the three patterns of stimulation discussed above will change in different ways if applied repeatedly. The effect of some thematically arousing details might not be influenced by repetition. With some variation, various forms of religious mythology and art can remain stimulating, potentially evoking new emotions and interpretations. Harsh (but innocent) sensory stimuli, in turn, are subject to habituation, losing their effect as attention magnets. In such a case, thematically arousing details, if there are such in the ritual, can receive attention and enhance memorization (hypothesis 1). Finally, repeated exposure to stress first creates resistance in the organism but causes damage if maintained in the long run (Selye, 1936). For example, some forms of early Christian monasticism probably created constant stress. The desert fathers lived in isolation and were exposed to the elements of nature. The stylites lived on a pillar. Such constant exposure to extreme stress is probably restricted to isolated cases in religions and is practiced on an individual basis, having little effect on the transmission of most religious traditions. It has to be noted that memories about such figures can form the basis of religious traditions, including emotionally laden narratives.

In terms of the ritual form theory, it is the consequentiality of special-agent rituals that generates vivid episodic memories about them: these are once-in-a-lifetime rituals that cause “superpermanent” changes and are, therefore, exceptionally important for the individual. This hypothesis concerns a special case of self-relatedness (hypothesis 3). The idea that a ritual is of ultimate significance for one’s life can be learned through explicit catechism or gathered

from other socially transmitted information. We can make three further observations about this type of rituals. First, memories about the significance of the ritual might be formed not only during the ritual itself, but also in instruction and reflection before and after the ritual. Memories about the details of the ritual can be also formed during narrative rehearsal rather than in the ritual itself. These factors, however, are beyond the scope of this essay. Second, self-relatedness can be achieved in different ways (hypothesis 3), rather than only through attributing salient personal significance to the ritual. Third, the effect of self-relatedness on memory can be modified by the factors considered in hypotheses 1, 2 and 4: thematically arousing details, attention-magnets, and stress. The latter two factors, in particular, can override the effects of self-relatedness.

Conclusion

This essay called attention to the significance of four factors influencing memorization for the study of the formation of long-term, explicit memories in rituals: thematically arousing details, salient visual stimuli, stress, and self-relatedness. Based on empirical work on these factors, I have put forward four hypotheses about memory in rituals, which can be tested in further empirical research. A brief assessment of the two major cognitive ritual theories suggests that – provided that empirical tests confirm my hypotheses – both theories will have to take into consideration some additional factors discussed in this essay. More work is needed to find out whether the four hypotheses about memorization can be integrated into one of the existing theories, or require the development of an alternative theory.

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