

*Remembering the Rites: Religious Learning Network
Model and Transmission of Religious Rituals
in the Worship of Nutrices Augustae
(Poetovio, Pannonia Superior)*

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Introduction

In recent years, an interest in the interdisciplinary study of religious ritual has emerged among scholars of antiquity. In attempting to explain how religious knowledge, including rituals, is learned and transferred, certain scholars of antiquity have turned to theories from Cognitive Science of Religion (CSR).¹ Although certain cognitive theories, such as Harvey Whitehouse's Modes of Religiosity,² have become prominent, most current CSR theoretical models were initially developed and based on modern religious practices and so may not be best suited to examining ancient religions. Unlike scholars of modern religions, scholars of ancient religions cannot conduct participant interviews and surveys and instead must make inferences principally from material evidence and texts, which are often incomplete and/or contradictory. Therefore, reconciling the process of learning and transmission of religious rituals between individuals, social groups, and material culture still proves problematic. In order to address these issues, I propose a new, CSR-based theoretical framework for understanding the process of learning and transfer of religious and ritual knowledge within ancient religions, which I term the Religious Learning Network (RLN) theoretical model.

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¹ Beck 2004, Misić 2015 and 2022, Panagiotidou and Beck 2017, and Moser 2019, among others.

² Whitehouse 2004, and Whitehouse and Laidlaw 2004, among other publications.

It is to be noted that the RLN model does not claim to provide a universal explanation for ritual transmission³ – for example, it does not yet account for ritual deviation⁴ or change in ritual practices that can occur over several generations. The RLN model does, however, contribute to bridging the gap between cognitive science research on ritual transmission and memory and historical and archaeological study of ritual communication, performance, and experience.⁵ The aim of the RLN is to provide a testable model for how religious rituals were learned and transmitted in the context of the Graeco-Roman world. In this respect, the RLN aligns with a fundamental CSR aim to produce ‘general models intended to provoke further research by applying them to specific contexts with an understanding of the cultural and historical context within which religious ideas are communicated’.⁶ As a theoretical model of ritual learning and transmission designed to be applied to material and archaeological evidence, the value of RLN rests with the possibilities it offers to be tested further in the context of different ancient cults. The RLN can therefore serve as a model for comparing different religious ritual traditions and practices throughout the Graeco-Roman world. The aim of the present chapter is to outline the RLN theoretical model and apply it within a case study of a Roman provincial mother-goddess cult, the *Nutrices Augustae*, so that we may better understand the types of rituals that may have been observed, the cognitive and social effects that these rituals may have produced upon the ritual participants, and the methods through which ritual knowledge was transmitted within this cult.

The cult of the *Nutrices Augustae* was chosen as the focus of this study for two reasons. First, as one of the best-attested cults in southern Pannonia in terms of iconographic and epigraphic evidence, the cult of the *Nutrices Augustae* can provide us with invaluable insight into Pannonian religious practices. Since the evidence for the worship of the *Nutrices Augustae* is confined to the Pannonian colony of Poetovio and its vicinity, and since this cult is not attested elsewhere in the Roman Empire, it becomes an even more important case study for understanding local provincial religions and

³ As Robert N. McCauley (2020: 119) states: ‘CSR’s explanations are like any other scientific explanations . . . They are theoretical, ergo, they are selective and not all-encompassing. Instead, the best theoretical explanations of science provoke new and deeper questions.’

⁴ For a discussion of ritual deviation see Abigail Graham’s Chapter 4 in this volume.

⁵ Many scholars, such as Sosis (2020: 6), Legare and Nielsen (2020: 5), and Eidinow *et al.* (2022: 8), have expressed a need for more interdisciplinary and integrative research between the Cognitive Sciences and the Humanities in order to advance the study and understanding of religious systems and rituals.

⁶ White 2021: 322 (quote), see also 204.

ritual practices. Although previous publications on the *Nutrices Augustae* have focused on exploring the nature and origins of the cult, no publication to date has specifically explored its ritual practices. The application of the cognitive RLN model to the material evidence of the cult of *Nutrices Augustae* will offer a novel perspective for interpreting this evidence, thus providing a deeper understanding of this cult and the religious rituals and practices that occurred within it. Second, the cult of the *Nutrices Augustae* was chosen as the focus of this study because it is one of the rare cults from the Roman Empire that features cross-generational ritual participation, with both parents and children recorded as worshippers of the *Nutrices Augustae*. Thus, the application of the RLN model to the evidence of the cult of the *Nutrices Augustae* can serve to further the understanding of both horizontal (between individuals in the same community) and vertical (from one generation to another) transmission of cultural and religious knowledge in the Roman Empire. This chapter aims to answer the following questions: what insights can the RLN theoretical model offer regarding the nature of rituals that took place in the cult of *Nutrices Augustae*? What cognitive and social effects could these rituals have produced on their participants? And last, how were rituals in the cult of the *Nutrices Augustae* learned and transmitted from one generation to another (i.e. from parents to children)?

Religious Learning Network Theoretical Model

Central to the understanding and transfer of religious ideas is the individual worshipper's mind. Despite individual differences in how we learn, understand, and interpret information, all learning and exchange of information requires interaction with external stimuli.⁷ These stimuli can be divided into four categories: **people**, **places**, **objects**, and **events**. Together, these stimuli form a common ground on which religious knowledge can be built and transferred among worshippers (**Figure 1.1**).

First, an individual learns by interacting with **people**, through observation, imitation, collaboration, and/or verbal and non-verbal communication.⁸ Within a religious context, an individual gains religious knowledge by

⁷ Montague *et al.* 2002: 908. Harris *et al.* (2010: 271) state: 'human cognitive processing is "hybrid": including not only the individual brain and body, but also the environment . . . an individual's neural system does not act in causal isolation from its environmental and social context'. According to Sosis (2020: 2): 'Like all communities, religious groups are influenced by external factors including the social, political, economic, ecological and socio-religious environment in which the group is situated.'

⁸ Legare and Harris 2016: 633, 635, Rogoff 2014: 70, 74, and Clegg *et al.* 2021.

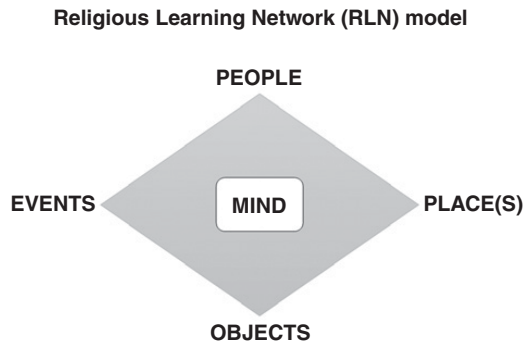


Figure 1.1 Religious Learning Network theoretical model: Part 1. Figure created by the author.

observing, imitating, and communicating with fellow cult members and religious authority figures, who serve as learning aides in initiating the individual into the religion.⁹ Depending on situational contexts, individuals employ differing variations and combinations of these approaches, consciously or unconsciously throughout their lives, in order to achieve the best learning outcomes.¹⁰ For example, children frequently engage in overimitation,¹¹ copying even unnecessary movements in a sequence of action, which adults are less prone to do since they have a greater understanding of causality of actions.¹² These learning strategies (observation, imitation, collaboration, and verbal and non-verbal communication) do not only occur in the context of religious and/or ritual learning, but are connected to everyday experiences, existing in a wider ‘*constellation* of cultural practices’.¹³ Thus, as individuals accumulate knowledge gained through life experiences within

⁹ Mackey 2017. In psychology and cognitive sciences this approach is referred to as social learning. Lyons *et al.* (2007: 19751) state: ‘a remarkable proportion of our abilities are learned by imitating those around us. Imitation is a critical part of what makes us cognitively human’.

¹⁰ Rogoff 2014: 77.

¹¹ Legare and Harris 2016: 635. For Cognitive Science of Religion research on overimitation see Legare and Nielsen 2015 and Clegg and Legare 2016, among others.

¹² Nielsen *et al.* 2015: 191. Legare and Nielsen (2015: 688) state that: ‘For instrumental learning, with an increase in experience, high fidelity imitation decreases and innovation increases.’

¹³ In her explanation of the LOPI (Learning by Observing and Pitching In) model, Barbara Rogoff (2014: 77) accounts for cultural practices such as imitation, observation, and collaboration, stating that they ‘are connected with many other aspects of children’s and families’ lives as aspects of coherent *constellations* of cultural practices . . . The idea of constellations contrasts with treating cultural practices such as schooling, parental occupations, or urban living as variables that operate independently’. See also Rogoff, Najafi and Mejía-Arauz 2014.

Sosis (2020: 3) states that ‘cultural evolutionists emphasize the importance of context, that is, the social environment, in explaining the transmission of particular religious beliefs’.

a particular cultural environment, they are able to extrapolate and apply this knowledge across different situations within the same (or similar) cultural context.

Second, an individual learns by interacting with a specific **place** through sensory cues. The architectural layout, the decorative features, and the smells, sounds, and objects specific to a particular place all contribute towards building a memory of and around that place.¹⁴ Therefore, a multifaceted ‘memory of place’ is created within the individual through the combined sensory experience of a particular location.¹⁵ The focal place for cultic activities is most often a temple, which through the numinous quality placed upon it by the community of worshippers, as well as through its repeated use (such as continued deposition of offerings), can become not only a place that preserves memory (*lieu de mémoire*) but also an agent in the transmission of religious knowledge.¹⁶

Third, an individual learns by interacting with **objects** through observation and/or physical manipulation (touching/handling). Objects, like places, are not passive entities, but can tacitly communicate information.¹⁷ Within a religious context, for example, when a worshipper sees an altar, they will quickly learn through observation what size and shape the altar should take, and if they witness another worshipper interacting with it they will be able to imitate the actions. Likewise, through physical manipulation of cult instruments an individual learns how they should be used. When handling a sacrificial knife, for example, an individual quickly discovers that the knife should be gripped by the handle since holding it by the blade is not only impractical but also dangerous, and since it is impossible to cut the sacrificial animal with the handle. Moreover, by retrieving past memories of encounters with similar objects (e.g. kitchen knives, daggers etc.) an individual who has never handled a sacrificial knife, for example, can also extrapolate through memory association how a sacrificial knife should

¹⁴ According to Day (2013: 2) ‘the senses are the mediums through which humans experience their world’. Connerton (1989: 74) argues that the senses form a key aspect of the ‘mnemonics of the body’. Hamilakis (2013: 411) states that ‘sensorial experience is activated at the moment of a transcorporeal encounter; this is an encounter ... between human bodies and objects, things, and environments’.

¹⁵ Mackey, personal correspondence, 29 April 2019.

¹⁶ Van der Ploeg (2016: 189) states: ‘Sacred space ... plays a vital role in the articulation and transmission of socio-cultural practices. It is, furthermore, the physical embodiment of the memory of a community and, as such, it reflects and expresses social behaviours, meanings and beliefs.’ See also Sutton 2020. For a further theoretical discussion of space/place from a geographical perspective see Steven Muir’s Chapter 5 in this volume.

¹⁷ Geertz (2017: 50) states: ‘Places and material objects have a life of their own which influences our emotional and cognitive lives.’ See also: Day 2013: 8, 14, and Sutton 2020.

be handled.¹⁸ The individual may not be able to recall every single time they have used a knife-like object in their life, but through accumulation and association of these past experiences they will have gained the general knowledge of what a knife looks like, how it should be used, what events/situations require the use of a knife and so on.¹⁹ Therefore, objects can exhibit agency by conveying sensory information about their appearance and their mode of use, but also by ‘triggering’ memories of past experiences that can then elicit particular emotional and behavioural responses.²⁰

Last, an individual learns by interacting with **events** through observation, imitation, and/or participation.²¹ An event, such as a religious ritual, is often participatory in nature²² – it brings people, objects, and place(s) together within the same temporal-spatial environment. Ritual events also bind participants together through shared, repeated, and choreographed proceedings.²³ Therefore, the people, the places, the objects, and the events that an individual interacts with become pillars on which their memories and knowledge are built. So, for example, if we remember a specific ritual (event), we will also remember by association where it took place, who we were with, what objects we used, and what we were doing. These pillars (people, places, objects, and events) dynamically form a network of memory associations, helping in the encoding, storage, and recall of information.²⁴ This network of memory associations, in its turn, forms an autobiographical narrative particular to each individual, which can facilitate the processing and remembering of complex phenomena, such as religious rituals.²⁵ As individuals reflect on the events, people, objects, and places that form their life experience, and thus construct their autobiographical narrative, they can derive a sense of meaning

¹⁸ This is not dissimilar to Lawrence Barsalou’s grounded cognition and situated conceptualisation approach, as outlined in Eidinow 2022: 76–9 and Van Cappellen and Edwards 2022: 117. Neuroscience research on memory retrieval (Sara 2000: 73) indicates that ‘remembering . . . involves the apprehension and comprehension of contemporary stimuli in the light of past experience . . . retrieval is usually brought about as a result of integration of incoming environmental information with the “memory network” driven by that information’. The concept of ‘memory network’ within the present RLN theoretical model is built on the cognitive/neuroscience understanding of memory as a network of associations (see Tulving and Thomson 1973: 352, 358).

¹⁹ According to Eidinow *et al.* (2022: 3) ‘Cognition proceeds on the basis of maps that are configured by prior experience, brain and body processes, and cultural and social models of behaviour that are continually updated throughout life.’ Laidlaw (2004: 4) uses a similar example of an individual getting a haircut in order to explain how the episodic (autobiographical) memories and semantic (general knowledge about the world) memories are connected.

²⁰ Moser 2019: 110–12, 119–22, 124.

²¹ Högberg *et al.* (2015: 848) state that: ‘It is the relation between observations and the experience of execution that results in social learning.’

²² Hull 2014: 166. ²³ Hobson *et al.* 2017: 10–12, and Mackey 2017.

²⁴ Eagleman and Montague 2002: 811, and Hamilakis 2013: 413.

²⁵ Martin (2022: 230) notes that humans have a tendency ‘for representing experiences through narrative’.

that will shape their identities. Emotionally intense experiences in particular, such as vivid religious rituals, may prompt an individual to create meaning from their individual religious experience.²⁶ As episodic events that build upon autobiographical knowledge,²⁷ rituals are personal (and often highly emotional) lived experiences, whose repeated performance becomes embodied and embedded in various (albeit connected) ways. The autobiographical narrative, thus, is the culmination of the individual's lived experiences – the places, objects, people, and events that the individual experiences form a network of memory associations.²⁸

This network may become re-enforced through repeated and/or similar experiences that build upon existing memories and experiences,²⁹ reshaping an individual's autobiographical narrative. In this respect, memories are malleable and can become reconsolidated and reformed upon retrieval.³⁰ While an individual may forget certain details of an event, or even misremember, the factual accuracy of the event memory is not necessarily important – the individual's perception of its validity and its importance is. Autobiographical memories, therefore, are selective.³¹ Research suggests that memories that are closely connected to self-identity are perceived as more important and thus more memorable.³² Autobiographical memories are also situational: they are embedded within particular contexts and memory network associations. What an individual remembers and how an individual remembers is influenced by various contextual factors and cues during memory formation as well as during subsequent memory retrieval.³³ For example, recalling an event in conversation with others can restructure an individual's original memory of the event depending on which details are emphasized in

²⁶ Harvey Whitehouse calls this phenomenon 'spontaneous exegetical reflection'. See Whitehouse 2004, van Mulukom 2017: 192, Moser 2019: 123, and White 2021: 272.

²⁷ Episodic memory relates to one's autobiographical memory. According to Tulving and Thomson (1973: 354): 'Briefly, episodic memory is concerned with storage and retrieval of temporally dated, spatially located, and personally experienced events or episodes, and temporal-spatial relations among such events.' See also van Mulukom 2017: 192.

²⁸ van Mulukom 2017: 197.

²⁹ Sara (2000: 73) states: 'retrieval will lead to the formation of new memories made on the background of a retrieved prior experience. Therefore, it is inconceivable that new memory can be acquired independently of retrieval of past experience'. On re-enforcement of memory associations through repetition see Tulving and Thomson 1973: 356–7.

³⁰ Hupbach *et al.* 2007: 47 and van Mulukom 2017: 197–8.

³¹ Harris *et al.* (2010: 266) state 'just as individual autobiographical memory is selective and goal directed, social memory is also likely to be selective, depending on the norms and values of the group that might prioritize certain items for retrieval and others for forgetting'.

³² Harris *et al.* 2010: 255–6, 259.

³³ Harris *et al.* 2010: 271. See the encoding specificity principle as outlined by Tulving and Thomson 1973: 353.

conversation during recall, who is recounting the event, and so on.³⁴ The retrieval and reactivation of a memory allows that memory to be modified, incorporating subsequent new and related memories that can be grouped by association.³⁵ Therefore, although a memory from an individual's autobiographical narrative can change and become reformed upon retrieval, the dynamic recall and reconsolidation process, by being built on existing memories and experiences, connects memories within an associative memory network, which can become re-enforced through repetition.

Within the RLN theoretical model, there are two exerting forces that play a role in the process of learning and remembering religious experiences. The first is repetition. A key characteristic of rituals is that they are repetitive, redundant, and occur in a specific sequence (rituals are often rigid, scripted, and synchronized).³⁶ Ritual actions are repetitive in order to 'attract and hold attention'.³⁷ Repetitive, redundant sequences of action stand out from everyday efficiency-oriented actions and are therefore attention-grabbing. Increased attention during ritual proceedings combined with repetition of movements would have led to a better learning and remembering of ritual events. Additionally, the motivation to ensure a successful ritual and a positive ritual outcome would have also led to 'mimicking previous successful practices'.³⁸ Roman rituals, in particular, were known for their 'high levels of routinization and procedural rigor'.³⁹ Unless completed correctly, rituals had to be repeated until the desired effect was achieved.⁴⁰ Considering such a high emphasis on correct performance, it is likely that individuals intentionally attempted to repeat and/or overimitate ritual actions that had produced a positive outcome in the past, leading to high-fidelity learning and transmission of ritual.⁴¹ Ritual proceedings may also have been rehearsed in one's mind prior to the performance of a ritual in order to ensure correct performance and success of ritual.⁴² Last, participating

³⁴ Harris *et al.* 2010: 266–8. Hupbach *et al.* (2007: 48) warn that the introduction of misleading facts can likewise modify a memory. Harris *et al.* (2010: 266) state that when it comes to autobiographical memory 'It originates with an individual's experience of an event but is maintained, shaped, and elaborated through interaction with others . . . as well as through individual identity goals.'

³⁵ Hupbach *et al.* (2007: 51) state: 'stored memories remain open to change as a function of related experience . . . the "multiple trace theory" (MTT) . . . takes as given that reactivating a previously "stored" memory leads to the creation of a new version of that memory.'

³⁶ Hobson *et al.* 2017: 2, White 2021: 259, 286 and Xygalatas 2022: 66–70.

³⁷ Nielsen *et al.* 2015: 192, 196. ³⁸ Rüpke 2020: 35. ³⁹ Moser 2019: 123.

⁴⁰ Plin. *HN.* 28.3 and Livy, *The History of Rome*, 41.14.7. See also Rüpke 2020: 26, 37.

⁴¹ Hobson *et al.* (2017: 14–15) state that 'As long as a shared ritual remains a fixed set of sequences, done in the exact same way as in previous instances . . . then the properties of the ritual experience that are encoded (and later retrieved) will remain relatively unchanged.'

⁴² Mental rehearsal before a performance is a common practice among athletes, known in sport psychology as cognitive specific imagery (see Paivio's Analytic Model of Imagery in Hall *et al.* 1998).

Religious Learning Network (RLN) model

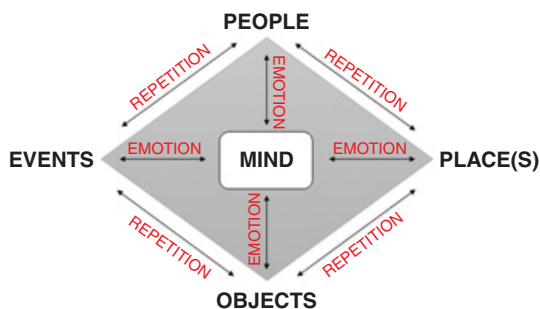


Figure 1.2 Religious Learning Network theoretical model: Part 2. Figure created by the author.

in the same ritual several times over the course of one's life would have likewise served to re-enforce memories of ritual proceedings. Thus, physical repetition of ritual actions and/or rehearsal of ritual in one's mind would have facilitated the learning and remembering of ritual proceedings. Ultimately, the repetition of ritual and its associations (people, places, objects, and events) would have reinforced the bonds between them and subsequently the whole memory network (Figure 1.2).⁴³

Another exerting force on learning and remembering ritual experiences is emotional investment.⁴⁴ The greater the emotional value placed on the divinity, the fellow worshippers, the temple, the rituals, and the ritual objects on the part of the worshipper, the more he or she will pay attention and be willing to learn, as well as remember longer.⁴⁵ In their turn, the four external stimuli (people, places, objects, and events) can also evoke emotional and motivational responses that drive behaviour. Research on autobiographical memories indicates that memories that include emotional content appear to

⁴³ Eagleman and Montague 2002: 807, Tulving and Thomson 1973: 356–7 and Xygalatas 2022: 115. Hobson *et al.* (2017: 15) state that 'cultural learning is maintained through ritual because meaning is transferred back onto the norms through frequent performance. Each time a ritual is performed or observed, a mental narrative is recreated, which acts as a reminder of what a group values most (and the meaning behind the purpose of the ritual) . . . With greater sense of collective purpose, a person will be motivated to continue to share and transmit the group's ritual practices.'

⁴⁴ van Mulukom (2017: 195) states that 'Emotional events are more likely to be remembered than neutral events.' McCauley (2020: 110) stresses 'the important role that emotion plays not only in the explanation of human behavior but also in a host of cognitive operations'.

⁴⁵ Emotional investment often goes hand-in-hand with positive emotions (e.g. the more we like someone the more we are willing to do for them). van Mulukom (2017: 195) states 'Positive memories have been shown to fade more slowly than negative memories'. See also Hamilakis 2013: 416.

be more memorable, and that even when individuals make an effort to suppress highly emotional memories (e.g. memories of traumatic events) those memories nevertheless persist.⁴⁶ The Religious Learning Network (RLN) theoretical model, therefore, facilitates narrative processing – the remembrance of ritual in narrative format – through a network of associations of ritual components (people, places, objects, and events) in combination with emotionality and repetition.

Nutrices Augustae

The *Nutrices Augustae*, female goddesses associated with the safekeeping of children, are almost exclusively recorded in the Roman colony of Poetovio (*Ulpia Traiana Poetovionensis*), corresponding to modern-day Ptuj, Slovenia.⁴⁷ The territory of Poetovio came to be occupied by the Roman army as of approximately 12 BCE, gaining colonial status under the emperor Trajan, and becoming the administrative centre of the province of Pannonia Superior. The neighbourhoods of Spodnja Hajdina (*Vicus Fortunae*) and Zgornji Breg seem to have been settled first, with Panorama, Vičava, and Rabelčja vas formed subsequently, once the settlement grew. The cosmopolitan settlers of Poetovio brought their gods with them from all corners of the Empire, who amalgamated with each other and with other pre-existing Celtic, Illyrian, and Pannonian divinities. Of these, the most popular at Poetovio were Jupiter, Mithras, and the *Nutrices Augustae*.⁴⁸

The *Nutrices Augustae*⁴⁹ are goddesses of possibly Celtic origin, and their cult may be connected with other Celtic healing and mother goddesses.⁵⁰ In terms of material evidence, they are attested primarily by inscribed and uninscribed reliefs, dating from the mid-second to the mid-third centuries CE.⁵¹ Even though several studies have been conducted on the cult of the *Nutrices*,⁵² no study to date has specifically

⁴⁶ Harris *et al.* 2010: 261, 264. Martin (2022: 221) states that ‘Responses to superstimuli are often emotion-laden, which enhances memorability.’

⁴⁷ Belak 1993: 236, Šašel-Kos 1999: 187–8, and Šašel-Kos 2016: 168–70. ⁴⁸ Šašel-Kos 1999: 153–4.

⁴⁹ Hereafter referred to as *Nutrices* for the sake of brevity.

⁵⁰ Šašel-Kos 2016: 167–9 provides a short survey of *Nutrices* and *Nutrices*-like goddesses throughout the Empire. According to Carroll (2014: 159), mother-goddesses are especially popular in Britain and Gaul but are also found in other western provinces of the Roman Empire. They are usually depicted as three seated goddesses holding objects associated with infant care.

⁵¹ For a detailed survey of over forty recorded dedications see Šašel-Kos 1999. Šašel-Kos (2016: 171) notes, however, that we should not discount the possibility ‘that *Nutrices* were worshipped elsewhere in Noricum and Celtic Pannonia, but in a different way; their worshippers did not erect costly reliefs to the goddesses’.

⁵² Gurlitt 1896, Wigand 1915, Diez 1993, Belak 1993, and more recently Šašel-Kos 1999 and 2016.

addressed the nature of rituals nor the effects of rituals that may have taken place within this cult. Therefore, I argue that if we take an *event* (in this case worship of the *Nutrices*) and apply it within the Religious Learning Network (RLN) model by examining the organisation of religious *place(s)* (in this case *Nutrices* sanctuary), the votive *objects* (in this case reliefs), and the *people* connected with the cult of the *Nutrices* (in this case inscriptions recording worshippers), we will be able to demystify what types of rituals occurred, what effects these rituals produced on the participants, as well as how ritual proceedings were learned and transmitted among worshippers.

Although the *Nutrices* are always invoked in plural form, on reliefs they are most often depicted as a lone sitting goddess holding an infant (sometimes swaddled, sometimes not) to her exposed left breast in the act of nursing.⁵³ The *Nutrix* is usually portrayed seated on the right side of the relief, an altar in front of her. An approaching mother-figure, positioned usually in the centre of the relief, holds out an infant towards the *Nutrix*. Behind the mother-figure stands an accompanying woman holding a tray or a basket of offerings on her head (**Figure 1.3**).⁵⁴

It is to be noted, however, that the iconography on the *Nutrices* reliefs is not homogenous, and that there are some iconographic variations of this scene. For example, *AE* 1986, 564 depicts two *Nutrices*, one on each side of the relief, with the mother-figure holding the hand of a little girl in the middle. *AIJ* 325 features a seated *Nutrix* in the centre of the relief, flanked by two female worshippers. *AIJ* 326 features a lone female worshipper making an offering on the altar in front of the *Nutrix*, while *AIJ* 330 depicts a lone seated *Nutrix*. Finally, *AIJ* 327 depicts a young boy extending an offering to the *Nutrix* while an accompanying female figure, standing behind the boy, holds a tray of offerings on her head (**Figure 1.4**).⁵⁵

We must be careful not to interpret these relief scenes as realistic representations of ritual.⁵⁶ Roman iconographic scenes of sacrificial rituals are known to combine different ritual elements and depict them as if

⁵³ Šašel-Kos 1999: 180, and Šašel-Kos 2016: 168–9.

⁵⁴ Carroll (2014: 159) describes the *Nutrices* reliefs: ‘On these reliefs, one of the *Nutrices Augustae* (‘noble nurses’) is depicted receiving mortal mothers who have brought their babies into the sanctuary to be breast-fed with divine milk.’

⁵⁵ For a more detailed discussion of these variations see Šašel-Kos 1999: 180–4.

⁵⁶ It must be noted that on numerous reliefs the gender of the child depicted often matches the name in the accompanying inscription. For example, *AE* 1986, 564 depicts the mother-figure holding the hand of a small girl who in the inscription below is named as Maximilla. The same is true for *AIJ* 329, where the girl, Successia, is also named in the accompanying inscription. Likewise, male children



Figure 1.3 *Nutrices Augustae* relief (PMPO, RL 978), held in Pokrajinski muzej Ptuj Ormož, photo by Boris Farič (reproduced with permission from the museum)⁵⁷

happening simultaneously, or even present a particular ‘snapshot’ of more extensive ritual proceedings.⁵⁸ However, it is possible that the iconographic variations observed on *Nutrices* reliefs may reflect the diversity of ritual experiences. Within the cognitive sciences an individual’s mind and their autobiographical memories are understood to be situated and extended into the environment which surrounds the individual. Since autobiographical memory is selective and finite (i.e. individuals can retain only so much information and are not able to encode and recall every detail of what they

presented to the *Nutrix* on AE 1986, 565, *AIJ* 327 and AE 1986, 569 match the male names in the inscriptions. Although we must be careful not to generalize, since some reliefs are damaged and/or uninscribed, this attention to gender in representation, in addition to iconographic variations of relief scenes, seems to suggest that artists did not simply carve a scene from a standardized sketch but that reliefs may have been customized.

⁵⁷ According to EDCS-07600367, AE 1986, 565, the **Figure 1.3** inscription reads: *Nutricibus Augustis / d[e]i[s] Aurelius Servandus et / Ulpia Secundina pro Secundino(?) et Servato fili(i)s votum v(oto) / s(oluerunt) l(ibentes) m(erito)*. See also Šašel-Kos 1999: 173, no. 33 for an alternative reading of the inscription.

⁵⁸ Moser 2019: 147. My gratitude to Emma-Jayne Graham for her insight on this point.



Figure 1.4 *Nutrices Augustae* relief (PMPO, RL 82), held in Pokrajinski muzej Ptuj Ormož, photo by Boris Farič (reproduced with permission from the museum)⁵⁹

perceive), an individual's environment therefore serves to extend and 'scaffold' their memories and cognitive processes.⁶⁰ This environment (e.g. places, objects, people, and events) can be imbued with mnemonic cues which can 'trigger' within the individual memories of past experiences. For example, students use course notes to remember past lectures and mixologists keep track of drinks ordered by making use of different cocktail glasses.⁶¹ However, the environment which surrounds an individual is not a mere passive holder of offloaded memories; through active engagement and re-engagement with their changing environment an individual's cognitive processing and their memories can be reshaped. In

⁵⁹ According to EDCS-30200477, *AIJ* 327, the **Figure 1.4** inscription reads: *Nutr[i]cibus pro sa(lu)te / Lucund[a]e dominae et Her[?]cliti fili(i) Ph[?]lo(?) pater v(otum) s(olvit) l(ibens) m(erito)*. See also Šašel-Kos 1999: 158–9, no. 5.

⁶⁰ Harris *et al.* 2010: 272, van Mulukom 2017: 197, and McCauley 2020: 110.

⁶¹ Harris *et al.* 2010: 272.

this respect, the individual and their surrounding environment interact in a dynamic process of ‘externalizing and re-perceiving’.⁶²

These cognitive approaches can be applied to the iconographic variations on *Nutrices* reliefs in order to provide an insight on the diversity of religious experiences. The representations of ritual on the *Nutrices* reliefs should not be taken at face value as veritable ‘snapshot’ images of ritual proceedings, but instead the reliefs may be understood as objects which extend the memory of an individual’s ritual experience into an environment. As each individual worshipper forms an autobiographic memory of their ritual experience, the setting up of an *ex voto* relief would have served as a material and external manifestation of the individual’s ritual experience and ritual memory. Each individual, therefore, may have selected and dedicated a relief that represented an aspect of their ritual experience that they deemed most important, and which closely aligned with their self-identity. This does not mean that the relief would have necessarily depicted accurate sequences of ritual proceedings, rather that it illustrated what the dedicator *perceived* as most pertinent to their own ritual experience. Since individual ritual experiences and autobiographical memories differed from worshipper to worshipper, these corresponding *Nutrices* reliefs would have translated into a variety of iconographic depictions, reflecting a variety of individual ritual experiences.

Dedicated reliefs, which formed part of the permanent decoration of the temple, may have also served to trigger and reshape the memory of past ritual experiences for individual worshippers visiting the temple.⁶³ A worshipper would have engaged not only with their own *ex voto*, but also with the dedications of other worshippers which were placed in the temple, serving simultaneously as reminders of others’ fulfilled vows and of their own completed ritual proceedings. Different relief images may have engaged individual worshippers on different levels: for some a certain relief image may have triggered emotional aspects of their own ritual experience, for others a relief image may have triggered forgotten details of their own ritual memory. An individual’s engagement with different reliefs would have therefore produced a dynamic recall and reconsolidation process of their own ritual experience, triggering some aspects of the original memory while also adding layers of new meaning and new memory associations.

⁶² Harris *et al.* 2010: 272.

⁶³ Rüpke (2020: 31) states that ‘Within a communicative framework, material object might also serve as triggers of attention and meta-communicative markers, producing special attention with a wide range of tools and acoustic, visual, olfactory or emotional markers.’

Place

Archaeological remains record only one *Nutrices* sanctuary located at Spodnja Hajdina, with two other sanctuaries presumed to be located at Zgornji Breg and Panorama.⁶⁴ The Spodnja Hajdina temple is small, measuring 11.30 × 8 metres, and of a rectangular, almost trapezoidal shape. In total twenty-three reliefs were found in or adjacent to the temple.⁶⁵ The temple is positioned within a religious complex, close to the first and the second Mithraeum (i.e. temple to Mithras), with some *Nutrices* dedications discovered inside the second Mithraeum.⁶⁶ The second *Nutrices* sanctuary, presumed to have existed at Zgornji Breg, would have been located adjacent to the third Mithraeum. Only three reliefs were discovered here.⁶⁷ The third sanctuary is presumed to have existed at Panorama on the basis of seven reliefs discovered in secondary use. Based on these finds, it is possible that these temples were smaller than the one at Spodnja Hajdina, with worshippers forming likely intimate, close-knit bonds.⁶⁸ The inscribed reliefs from these sanctuaries record a mix of slave and citizen dedicators.⁶⁹ Therefore, we have at least three sanctuaries to the *Nutrices* located within Poetovio, all in use

⁶⁴ Šašel-Kos 1999: 155, and Šašel-Kos 2016: 168. ⁶⁵ Šašel-Kos 1999: 155–6.

⁶⁶ *AIJ* 327 = *CIL* III 15184.25 and *CIL* III 15184.26. According to Šašel-Kos (2016: 172–3), certain *Nutrices* reliefs may have been moved to the second Mithraeum in the fourth century CE for safekeeping, as she suspects the cult may have continued to be practiced in secret after Christianity becomes the official religion of the Empire. See also: Belak 1993: 236.

⁶⁷ *AIJ* 325, Belak 1993: 236, and Šašel-Kos 1999: 166.

⁶⁸ According to Van der Ploeg (2016: 189): ‘Spiritual cohesion was maintained and reinforced via religious space and architecture.’

⁶⁹ As concerns the Spodnja Hajdina sanctuary, most inscribed dedications are damaged and fragmentary, with only two offering enough information in order to establish social/professional affiliations of worshippers. Both of the dedicators are slaves in the imperial administrative service. One (*AIJ* 335 = *CIL* III 14062) identifies himself as Aeliodorus *contrascriptor servus Augusti nostri*, indicating that he was affiliated to the customs service; while the other (*CIL* III 14052) identifies himself as Theophilus *Augusti servus*, a slave possibly attached either to the customs service or the *tabularium* in Poetovio. Names on other legible dedications from Spodnja Hajdina record both slaves and citizens – Heraclitus (*AIJ* 327 = *CIL* III 15184.25), Achelous (*CIL* III 14059), Aurelius Viator (*AIJ* 332 = *CIL* III 14053), and Benignes Vitalis (*AIJ* 334 = *CIL* III 14056).

The three preserved dedications from the Zgornji Breg sanctuary, however, offer no information about social/professional affiliations although the names of the dedicators may indicate that they are descended from Celtic and/or autochthonous inhabitants – Aurelius Siro (*AIJ* 325), Valerius Secundianus (*AIJ* 330), and Successius Maximianus and Malia Verina (*AIJ* 329).

As concerns the Panorama sanctuary, some recorded dedicators possibly display servile status – Fortunatus (*AIJ* 326 = *CIL* III 4047) and Vitalis and Vintumila (*AE* 1986, 564). Others display their citizen status – Aurelia Exxuperata (*AIJ* 324), Aurelius Servandus and Ulpia Secundina (*AE* 1986, 565), and Aelia Vera (*AE* 1986, 567). Few of the dedicators also hold official positions in Poetovio – Titus Cassius Verinus *decurio coloniae Poetovionensium* (*AE* 1986, 568), Aelius Secundinus *decurio* (*AIJ* 328 = *CIL* III 4052/3), and Lucius Fuscinius Exsuperatus *Augustalis coloniae Poetovionensium* (*AE* 1986, 569).

simultaneously. It would appear then that each congregation created its own local, neighbourhood temple. This organisation may have promoted distinct neighbourhood identities, while at the same time fostering solidarity among the different inhabitants of Poetovio.

As the RLN model stipulates, the architectural features of a sanctuary can give us an indication of what types of religious rituals may have taken place there. On the basis of preserved archaeological remains of the Spodnja Hajdina temple we can draw certain conclusions. First, the small size of the temple limited the number of worshippers that could assist and/or participate in the rituals. Accounting for the measurements of the temple, only a few worshippers (perhaps one or two extended families) may have been able to fit inside the temple at a time. Such a confining space would have restricted movement, meaning that rituals likely did not involve large gatherings nor elaborate pageantry. The rituals which took place then, were likely an intimate affair, fostering close interactions among worshippers, and promoting the formation of local group identities.

Additionally, the small number of dedications preserved, only twenty-three in over a century of use, further support the claim that the cult of the *Nutrices* may have been exclusive.⁷⁰ Legible inscribed dedications from the Spodnja Hajdina sanctuary indicate that at least some worshippers were slaves employed in the imperial administrative and customs service.⁷¹ It is therefore possible that the cult would have been purposefully kept small, administered possibly through social and/or professional networks. The Poetovian Mithraic congregations appear to have been similarly organised: formed largely around social and professional networks (recorded worshippers include slaves/freedmen in the imperial administrative and customs service, and soldiers), with up to five temples spread throughout the different neighbourhoods of the city.⁷² Considering the geographical proximity of the Spodnja Hajdina temple to the first and the second Mithraeum, and the fact that slaves and freedmen working for the imperial administrative and customs services are found as worshippers of both Mithras and the *Nutrices*, one could speculate that the Spodnja Hajdina sanctuary was initially built and frequented by these men and their families, whose offices and perhaps living quarters may have been located nearby.⁷³ The cult of the *Nutrices*, thus, may have mirrored the intimate,

⁷⁰ Šašel-Kos 2016: 169. ⁷¹ *AJ* 335 = *CIL* III 14062, *CIL* III 14052.

⁷² Belak 1993: 234–6, and Misic 2015. ⁷³ Šašel-Kos 1999: 185.

tightly-knit ties of the Mithraic cell (congregation), while catering to those whom Mithras could not help – the non-initiate wives and children.⁷⁴

Secondly, the small size of the Spodnja Hajdina *Nutrices* temple would have framed the sensory experience of the worshippers, creating a more favourable environment for the learning and transmission of religious knowledge. In essence, since the temple was small, the worshippers likely stood close to each other, perhaps even touching; and the view, sound, and smell of the ritual proceedings may have been relatively unhindered. The physical closeness between worshippers, as well as the intimate atmosphere, would have contributed to creating not only close-knit bonds between the ritual participants; but since they were able to hear, see, and experience all the ritual proceedings from close-up, their likelihood of learning and remembering the ritual proceedings would have been increased. These claims align well with the RLN model, which stipulates that individuals interact and learn from a specific environment through visual, auditory, olfactory, gustatory, and tactile cues. Therefore, the architectural layout, the decorative features, and the smells, sounds, and objects that the worshipper came in contact with during ritual would have all contributed towards creating a network of memory associations, effectively encoding the memory of the ritual as an autobiographical narrative.⁷⁵

Objects

In addition to the architectural features of a sanctuary, decorative and votive objects also played an important role in the learning and transmission of religious knowledge. The act of setting up an inscribed altar or relief forms one part of ritual performance in itself, and these objects indicate that significant effort, time, and financial resources were put into their planning, manufacture, and consecration in the temple.⁷⁶ In particular objects in stone, such as reliefs, statues, and altars, would have formed a key

⁷⁴ A study is forthcoming by the present author which will test the RLN model within the Pannonian evidence of the cult of Mithras as part of her HORIZON EU MSCA project CAMRIP (Cognitive Aspects of Mithraic Rituals in Pannonia). For a further analysis of the cult of Mithras see Vicky Jewell's Chapter 3 in this volume.

⁷⁵ For a further analysis of sensory stimuli in relation to ritual space/place see Chapter 4 by Steven Muir and Chapter 5 by Abigail Graham in this volume. My gratitude to an anonymous reviewer who remarked that emotional arousal can be likewise stimulated by monumental architecture.

⁷⁶ In her discussion of infant funerary monuments Carroll states (2014: 161): 'the act of seeking out and paying not inconsiderable sums of money for a memorial in stone testifies to the special nature of these objects'. This point is equally valid for votive monuments such as the *Nutrices* reliefs.

and permanent aspect of the decoration of the sanctuary, becoming an integral part of the 'persistent place' of the temple.⁷⁷

Although, as discussed above, we must be careful not to interpret the reliefs dedicated to the *Nutrices* as completely realistic representations of ritual proceedings, nevertheless, they may offer us some clues as to what type of rituals may have been performed. A standard motif on the *Nutrices* reliefs is the depiction of female worshipper(s) bringing offerings of foodstuffs, often interpreted as fruit, bread, or cakes to the seated goddess (see **Figure 1.3** and **Figure 1.4**).⁷⁸ Šašel-Kos notes that in the case of the nursing Kourotrophi goddesses 'cakes made of first-fruit were offered to them, since these goddesses were essentially deities of fertility'.⁷⁹ Due to their connection to nursing and safeguarding of children, it is possible that the *Nutrices* also received similar offerings. Some reliefs also depict offerings of liquids, as an *urceus* (jug for liquid libations)⁸⁰ and a *patera* (dish used in sacrificial rituals)⁸¹ can be seen in use.⁸² It is possible that water played an important role in *Nutrices* rituals due to its purifying and healing properties.⁸³ A female worshipper on *AIJ* 325 carries a towel, indicating the act of ritual hand-washing.⁸⁴ Additionally, water elements are indicated on a relief depicting a *Nutrix* sitting next to a woman, presumably a Nymph, who carries a sea shell;⁸⁵ as well as by the fact that the Spodnja Hajdina sanctuary was located in close proximity to a spring. Therefore, water may have been used for purification prior to the start of the ritual(s), as well as an offering for health during ritual(s).

In addition to offerings of food and liquids, it is also possible that incense may have formed part of the *Nutrices* ritual. The burning of incense was a frequent offering to the divinities in Roman religious practice.⁸⁶ Gurlitt interprets a cylindrical canister carried by an attendant on *AIJ* 334⁸⁷ as a portable incense altar,⁸⁸ while another relief appears to show a female worshipper carrying a box of incense and making an offering over an altar.⁸⁹ Incense may have been burned as an additional form of purification, and/or to call down the attention of the divinity.⁹⁰ The cylindrical canister may be alternatively understood as a lantern,⁹¹ in which case it may

⁷⁷ Hull 2014: 173. ⁷⁸ As depicted on *AIJ* 327, *AIJ* 332, *AIJ* 333, and *AIJ* 334.

⁷⁹ Šašel-Kos 2016: 168. ⁸⁰ As depicted on *AIJ* 325, and *AIJ* 326 = *CIL* III 4047.

⁸¹ As depicted on *AIJ* 325, *AE* 1986, 564, and *AIJ* 326 = *CIL* III 4047.

⁸² For a further discussion of cult instruments in Roman rituals see Emma-Jayne Graham's Chapter 2 in this volume.

⁸³ Šašel-Kos 1999: 184 and 2016: 169. ⁸⁴ Siebert 2015: 391.

⁸⁵ *AIJ* 328 = *CIL* III 4052/3, and Šašel-Kos 1999: 184. ⁸⁶ Weddle 2013: 140.

⁸⁷ Possibly also on *AIJ* 332 and on Šašel-Kos 1999: 176–7, no. 38.

⁸⁸ Gurlitt 1896, and Šašel-Kos 1999: 156. ⁸⁹ *AE* 1986, 567. ⁹⁰ Huet 2008: 105.

⁹¹ Šašel-Kos 1999: 156 and 176, no. 38.

indicate that rituals took place inside the temple and/or in low light (early morning/evening). Representations on reliefs give no indication that music accompanied the rituals described above, or that public processions or animal sacrifices were part of rituals performed; however, as discussed above, the relief images may only depict select aspects of more extensive ritual proceedings.

If we interpret this evidence within the RLN model we can see that the objects used would have played an important role in the encoding and transmission of religious knowledge. The worshippers' senses would have been engaged through the manipulation of the objects⁹² – the texture of incense upon touch, its pungent smell when burned, the sight of flickering lantern light, the sound of pouring liquid, combined with the sacredness of the temple and the emotional connection to the goddess(es) and fellow worshippers, all worked to create a network of associations in the memory of the worshipper. This would have resulted in a distinctive sensorial experience for each worshipper,⁹³ becoming part of their autobiographical narrative. Additionally, since these same cult objects (e.g. *urceus*, *patera* etc.) were also used in rituals for other divinities, interaction with them would have evoked memories of previously performed rituals.⁹⁴ Furthermore, because religious rituals in the Roman world were sequenced and repetitive events, observed and/or performed since childhood, they would have become therefore deeply embodied.⁹⁵

People

In addition to iconography, many reliefs also display inscriptions which indicate that the *Nutrices* were invoked for healing and/or well-being purposes of a child (the formula *pro salute* appears on dedications from all three sanctuaries).⁹⁶ It is also possible that the *Nutrices* were invoked and celebrated during important childhood and/or family

⁹² For a further analysis of haptic ritual experiences see Emma-Jayne Graham's Chapter 2 and Vicky Jewell's Chapter 3 in this volume.

⁹³ According to Van der Ploeg (2016: 188–9) 'Each individual would have had a different experience of the event, depending on their sensory input, as each of the senses had a varied range and sphere of influence.'

⁹⁴ Rüpke (2020: 33) states that 'relations were established and habitualized not only to specific places and material objects, but also to acoustic phenomena and ways of speaking, thereby creating webs of associations between situations involving similar objects or sounds'.

⁹⁵ Högberg *et al.* 2015: 848 (referring to Riede's study of stone tool use in the Palaeolithic).

⁹⁶ Spodnja Hajdina sanctuary: *CIL* III 14052, *CIL* III 14055, *CIL* III 14057, *CIL* III 14061, *AIJ* 327, and possibly *CIL* III 14059 and *AIJ* 334 = *CIL* III 14056.

Zgornji Breg sanctuary: *AIJ* 329 and *AIJ* 325.

transitions (e.g. birth of a child, celebration of a childhood rite of passage, survival of a significant childhood illness etc.).⁹⁷ In pre-modern societies there were significant health risks associated with childbirth and early childhood to an extent that in many cultures ‘the perinatal period is heavily ritualized’.⁹⁸ *Nutrices* rituals, therefore, may have been special occasion rituals, marking significant events in a child’s life. This may be supported by the small number of dedicated reliefs, although we cannot discount other types of dedications and offerings which have not survived.⁹⁹ If these were special occasion rituals celebrating important life events, then they were likely highly memorable and emotionally arousing rituals tied closely to the identity of the child and their family unit. Whether the *Nutrices* rituals were the result of positive events (e.g. thanking the goddesses for the birth of a child or celebrating a child’s rite of passage) or negative events (e.g. entreating the goddesses to help a sick child), the emotionality surrounding the event and the shared ritual performance among the members of the family unit would have undoubtedly strengthened the bonds between the ritual participants.¹⁰⁰

Even if the *Nutrices* rituals were special occasion rituals and therefore infrequently performed, this does not necessarily signify that they would not have been repeated. A family with multiple children, for example, may have invoked the *Nutrices* not only during different stages of a child’s life, but would have likely repeated ritual proceedings for each child.¹⁰¹ Although we cannot discount the possibility that there may have been different types of *Nutrices* rituals to mark key events in a child’s life, and we must acknowledge that ritual experiences differed from one ritual to another and from one individual to another; since rituals were shared among the family repeated (even if different) rituals for the *Nutrices* would have come to form a network of memory associations within the autobiographic memories of participating family members as well as

Panorama sanctuary: *AE* 1986, 568, *AJJ* 328, *AE* 1986, 569, *CIL* III 4047 = *AJJ* 326, and possibly *AE* 1986, 567 and *AJJ* 324.

⁹⁷ On personal transition rituals see Rossano 2020: 6–7. It is possible that some of the *Nutrices* reliefs may have been set up to mark a successful rite of passage from infancy (ending at around three years old) into further childhood, thus thanking the *Nutrices* for the protection of the child during these precarious early years. For a further discussion of rites of passage with respect to infant votives see Derks 2014 and Graham 2014.

⁹⁸ Legare and Nielsen 2020: 2.

⁹⁹ Rüpke (2020: 30) states that ‘Small gifts, many of them perishable, must have been the standard sacrificial objects of poor people, that formed the vast majority of ancient populations, even in non-routine situations.’

¹⁰⁰ Boyer and Liénard 2020: 2 and Rossano 2020: 3.

¹⁰¹ My gratitude to Emma-Jayne Graham for drawing my attention to this.

a shared database of religious knowledge. For example, a parent who had already performed a specific *Nutrices* ritual for one child would have been able to recall the ritual proceeding when the time came to repeat this ritual for subsequent children. These ritual experiences may have been different, but within the parent's autobiographical narrative they would have formed distinct yet connected memories of the ritual events.¹⁰² According to the RLN model, therefore, the repetition of ritual and the emotional investment in the ritual and fellow ritual participants helped to embed the memory of ritual proceedings as part of a network of memory associations within an individual's autobiographical narrative.

According to the legible and/or complete *Nutrices* relief inscriptions, a significant number of reliefs were set up by both parents on behalf of their child, with perhaps a smaller number of dedications erected by the father or the mother alone.¹⁰³ Although there is no specific mention of children's ages in the inscriptions, the reliefs depict infants, that is, children under the age of three years old. This early stage of childhood was particularly precarious in the Graeco-Roman world since infants were perceived as feeble, dependent on breastfeeding, and susceptible to various illnesses, thus needing the care of a *Nutrix*.¹⁰⁴ It is therefore possible that at least some of the children mentioned on the reliefs would have been afflicted or in danger of some illness or calamity which worried their parents sufficiently in order to solicit the help of the *Nutrices*.¹⁰⁵ If this was the case, then the high level of emotional attachment to their children, combined with the high-stress and high-emotionality experienced due to the misfortune of a loved one, would have worked to imprint the ritual proceedings into the memories of the ritual participants.¹⁰⁶ In other words, since the

¹⁰² Rüpke (2020: 31) states: 'The material and social relations established in religious communication have effects beyond the actual performance. Memories of such usages and constellations keep such relationships alive, repetition might renew them.'

¹⁰³ Dedications where an explicit familial connection is stated: *AIJ* 327, *AIJ* 329, *AE* 1986, 564, *AE* 1986, 565, *AE* 1986, 567, *AE* 1986, 568 and *AE* 1986, 569.

Dedications set up by the father: *AIJ* 325 and perhaps *AIJ* 326 = *CIL* III 4047, and *AIJ* 330.

Dedications set up by the mother: *AE* 1986, 567.

Dedications set up jointly by both parents: *AIJ* 324, *AIJ* 329, *AE* 1986, 564, *AE* 1986, 565, *AE* 1986, 568, and *AE* 1986, 569.

¹⁰⁴ Dasen 2011: 291–2, 294–5, 312, and Bourbou and Dasen 2018: 60–1.

¹⁰⁵ Šašel-Kos 1999: 186, 191. While none of the inscriptions state a specific medical condition or ailment, recent research on children's health in the Graeco-Roman world (Dasen 2011, Carroll 2014: 160, and Bourbou and Dasen 2018, among others) indicates that some of the notable medical problems encountered in infancy are diarrhea, epilepsy, teething troubles, malnutrition, infections, fever, scurvy, and rickets, among others.

¹⁰⁶ van Mulukom (2017: 199) states: 'When individuals experience a significant and highly emotional event, this event creates a lasting episodic memory in their minds.'

well-being of their child depended on performing the ritual correctly, the parents would have devoted much attention and effort to memorizing and performing the ritual sequences needed to invoke the *Nutrices*.

Additionally, it is likely that the parents may have remembered the rituals for a long time, even after the significant event for which the ritual was performed had passed. Recent research on autobiographical memories indicates that ‘memories of turning points in people’s lives . . . continue to attract attention and evoke feelings . . . and may guide behavior’.¹⁰⁷ Therefore, the memory of specific rituals may not only persist due to the emotional importance placed on them; but the parents may continue to repeat *Nutrices* rituals in order to ensure that their child stays healthy and/or to prevent some future calamity to their child.¹⁰⁸ In this way, because an illness of a child, for example, is a highly emotional and painful moment of a parent’s life, it becomes an important defining memory, closely tied to their identity as a parent. These self-defining memories elicit not only high emotions, but due to their importance, can also be repeatedly recalled and further linked to related memories,¹⁰⁹ becoming stronger and more embedded. This is reflected in the RLN model, which posits that emotional investment in a ritual and its repetition work together to embed the ritual memory, which is further reinforced through the network of memory associations.

Another aspect to be observed on the reliefs of the *Nutrices* cult is the image of the ‘presentation’ of the child. Female worshippers are depicted presenting the child to the *Nutrix*, holding the child outwards as if the goddess is about to receive it into her own hands and bless it (**Figure 1.3**).¹¹⁰ Thus, the child is blessed and/or healed by the divine (and symbolic) touch and/or presence of the goddess(es) (**Figure 1.4**). Even if the performed ritual lacked a medical effect, psychologically, the ‘placebo effect’ produced by the ritual would have generated a positive emotional state in the worshipper, providing reassurance, hope, and psychological relief.¹¹¹ In

¹⁰⁷ van Mulukom 2017: 196.

¹⁰⁸ This can be related to threat-detection psychology as explained in Boyer and Liénard 2020: 3–5.

¹⁰⁹ van Mulukom 2017: 196.

¹¹⁰ *AE* 1986, 565, *AE* 1986, 566, and *AE* 1986, 569, among others.

¹¹¹ Hobson *et al.* 2017: 6–7, 9. According to Legare and Nielsen (2020: 2) a ritual can have ‘the beneficial psychological effects of reducing parental anxiety and increasing feelings of control over the health and safety of their infant’. Moreover, according to Legare and Nielsen (2020: 4): ‘Rituals also allow individuals to exert agency through action, giving the illusion of increased control that could also be related to emotional regulation and anxiety reduction . . . and may improve perceived health.’ For research on how rituals can reduce anxiety see Lang *et al.* 2020. On the numerous physiological, psychological, and social benefits of rituals and the placebo effect see Xygalatas 2022: 227–30, 242.

turn, these positive feelings experienced as a result of the performed ritual would have motivated the worshipper to repeat the ritual, effectively reinforcing ritual behaviour¹¹² and embedding the memory of ritual proceedings in the mind of the worshipper. This fits well within the RLN model – emotional attachment to their child and its well-being would have motivated the parents to keep frequenting the temple and to keep participating in rituals. In turn, repeated exposure to the temple, the votive objects, the rituals, and the fellow worshippers would have, through repetition and association, encoded religious knowledge, such as ritual proceedings, in the memory of the individual worshipper.

A further key feature to be observed in the votive evidence of the *Nutrices* cult is the social nature of ritual. Relief inscriptions record not only the child but also the parent(s) as well as occasionally siblings (**Figure 1.3**). The reliefs also often depict not only the mother and the child, but very often one and sometimes two additional female figures, who assist in the ritual by carrying the offerings (**Figure 1.3**). It may be possible to interpret these figures as servants,¹¹³ fellow worshippers, family members,¹¹⁴ and perhaps even as cult attendants, who support the worshipper in the performance of ritual proceedings. It is also possible that, beyond the immediate family members, extended family members, friends, and neighbours also took part in ritual proceedings for the *Nutrices*, showing up to support each others' families during significant events in their children's lives (e.g. celebration of a childhood rite of passage, illness of a child etc.). Cognitive research indicates that group rituals foster both emotional and social bonds between ritual participants – since the individuals who sought the help of the *Nutrices* all experienced deep concern for the well-being of their children, group rituals would have bonded them through shared feelings and shared performed ritual experience, providing effectively a support group.¹¹⁵ In this way, group rituals would have created social cohesion, stability, and routine during uncertain times and/or transitional

¹¹² Lang *et al.* 2015: 1895. ¹¹³ Šašel-Kos 1999: 181–2.

¹¹⁴ See the two uninscribed reliefs published in Šašel-Kos 1999: 176, no. 37, fig. 23; and 176–7, no. 38, fig. 24. Šašel-Kos (1999: 182) states: 'the cult of the *Nutrices* was a family cult, performed, however, not only at home, but also in a public place, in small sanctuaries or shrines, in a circle of several families'.

¹¹⁵ Hobson *et al.* 2017: 4–5, 11–12. Rossano (2020: 4) states that 'The human brain has evolved to treat uncertainty and lack of control as safety and survival threats . . . Strong social support systems provide security from these threats . . . Thus, ritual may well be an evolved strategy for increasing "social security" against the threat of future uncertainty and lack of control . . . rituals address these threats by cultivating . . . social support.'

life events in addition to fostering the creation of local group identities and community ties.¹¹⁶

The notion that rituals may have been scripted/choreographed, with everybody knowing their assigned place and actions (e.g. the mother presenting the child, the attendant carrying offerings etc.), would have further reinforced each person's sense of group belonging, as everybody participated in the same event and had an important role to play in the successful completion of the ritual.¹¹⁷ Additionally, if extended family members, friends, and neighbours participated in each others' ritual proceedings then individuals may have taken part and/or witnessed repeated instances of *Nutrices* rituals. As Jörg Rüpke points out: 'Typically, ritual actions did not remain a one-off thing. Patterns of repetition were important for the formation of real or imagined worshipping communities, establishing horizontal relationships of different degrees of intensity.'¹¹⁸ Therefore, as the Religious Learning Network theory posits, emotional investment in the well-being of the child, the family unit, and the fellow community of worshippers would have combined with repetition of ritual in order to facilitate the learning and remembering of ritual proceedings.

Finally, we must not forget that since children also observed and participated in the ritual proceedings, religious and ritual knowledge would have been transmitted to the next generation.¹¹⁹ Cognitive research indicates that children as young as one year old are capable of learning ritual actions through observation and imitation of adults.¹²⁰ Yet, children are selective learners. They are particularly attentive to various didactic signals (e.g. eye contact, verbal communication paired with actions etc.) from trustworthy in-group members such as parents and relatives, since

¹¹⁶ Šašel-Kos (1999: 191–2) states: 'Their cult must have been important for families, especially mothers, nurses and children, who thus had the opportunity of coming together during times of festivity. They could share their experiences on such occasions, coping with cognate difficulties concerning children, regardless of their social status. Thus the cult of the *Nutrices* . . . may have had a positive and unifying social impact within the community.' On how participation in group rituals can lead to social bonding see Dunbar 2021.

¹¹⁷ Hobson *et al.* (2017: 11) state that 'the function of a shared group ritual is to allow an individual to participate fully in the social world by affiliating with fellow group members, reaffirming one's position in the group, and sharing in important social conventions and cultural knowledge'.

For a perspective on the unpredictability of rituals and how they can turn unsuccessful see Abigail Graham's Chapter 4 in this volume.

¹¹⁸ Rüpke 2020: 39.

¹¹⁹ Hobson *et al.* (2017: 11) state: 'observing a group ritual helps a person learn and share cultural knowledge related to the social norms most important to the group'.

¹²⁰ Mackey 2017, Hobson *et al.* 2017: 14, and Wen *et al.* 2020: 1–2. Legare and Harris (2016: 637) indicate that children as young as eight months old can associate certain actions to appropriate cultural artefacts through observation.

they seek to affiliate and display a sense of belonging towards the members of their group.¹²¹ In addition to this motivation for affiliation and conformity, children's general predisposition for overimitation of adults (i.e. the replication of even redundant gestures in a sequence of action) also results in higher fidelity learning and transmission of knowledge and behaviours between adults and children.¹²² Research from the cognitive sciences, therefore, indicates that children show an innate receptivity towards ritualized activities, since one key aspect of rituals is that they feature redundant actions in a sequenced performance.¹²³

Moreover, since rituals are causally opaque (i.e. there is no clear link as to how the ritual actions performed bring about the desired ritual goal), individuals are even more motivated to imitate ritual actions faithfully due to this uncertainty.¹²⁴ This may be particularly true with respect to children, since they are relatively inexperienced ritual participants. Thus, 'the costs of not imitating with high fidelity in an uncertain situation outweigh the benefits of the reduced effort entailed in imitating with low fidelity'.¹²⁵ Overall, children faithfully copy (i.e. overimitate) the ritual actions of trusted adults because they want to conform and be accepted by their social group.¹²⁶ This high-fidelity imitation ultimately results in high-fidelity learning, even if the learning of the technical elements of the ritual was not the original nor ultimate goal of the child. Overimitation therefore facilitates learning through high-fidelity repetition of even redundant sequences of action, as well as through motivation for emotional and social bonding/affiliation with members of the in-group. This concurs with the RLN model, which states that emotional investment and repetition work together to facilitate the learning of ritual elements.

Children are not just observers and imitators, but also actively participate in their learning process through experimentation – they 'take their apprenticeship into their own hands'.¹²⁷ In the Graeco-Roman world, once

¹²¹ Legare and Nielsen 2015: 691, Legare and Harris 2016: 635–6, 638, Nielsen *et al.* 2015: 191, and Wen *et al.* 2020: 1–2.

¹²² Legare and Nielsen 2015: 689, Legare and Harris 2016: 635, Legare and Nielsen 2020: 4 and Xygalatas 2022: 40–3.

¹²³ Legare and Harris 2016: 636, and Nielsen *et al.* 2015: 192, 197. Xygalatas (2022: 39) points out: 'From around the age of two, children typically develop a variety of rules and routines that they follow compulsively. They are obsessed with repetition, acting out the same things over and over again.'

¹²⁴ Legare and Nielsen (2015: 690) state: 'causal opacity of rituals make them ideally suited to high fidelity cultural transmission'. On causal opacity of rituals see Xygalatas 2022: 6–7 and 88–94.

¹²⁵ Legare and Nielsen 2015: 690.

¹²⁶ Legare and Nielsen 2015: 690–1. Nielsen *et al.* (2015: 196) state that we 'reinforce behavior we think makes us part of our perceived in-group'.

¹²⁷ Legare and Harris 2016: 636 (quote), Rogoff 2014: 70 and Clegg *et al.* 2021: e56–e58.

a child reached the age of two or three years old they were introduced into religious life and began to participate in religious rituals.¹²⁸ This is corroborated by depictions on *Nutrices* reliefs – *AE* 1986, 564 and *AIJ* 329 both depict a little girl holding a woman's hand, observing as the woman gives an offering to the *Nutrices*. Additionally, **Figure 1.4** (*AIJ* 327) depicts a little boy actively participating in the ritual and 'learning by observing and pitching in'¹²⁹ – he extends an offering to the *Nutrix*, with an adult female figure standing behind him, likely supervising and guiding him. By observing, participating, and imitating the ritual actions of trusted adults, and the intent seriousness which the adults accord to them, the child is able to infer their importance and sacredness,¹³⁰ as well as to acquire knowledge of ritual activities and norms.¹³¹

Since the cult of the *Nutrices* was centred around the family, the inclusion and participation of the child in the ritual proceedings, as a recognized family and community member, would have been even more important. By participating in the ritual proceedings for the *Nutrices*, the child actively contributed to the well-being and success of their family unit. These different methods of learning and cross-generational knowledge transmission – observation, imitation/overimitation, participation/experimentation and collaboration – have been shown to be present in children across cultural groups,¹³² and therefore very likely also facilitated the transmission of religious knowledge between adults and children in the cult of the *Nutrices*, and more widely within the Graeco-Roman world.

We also must not forget that learning, remembering, and transmission of knowledge occurs within a social context. Although children learn through observation, imitation, and participation, environmental, cultural, and social influences also play a role in the preservation and transmission of knowledge.¹³³ As has been pointed out in the RLN model, an

¹²⁸ Dasen 2011: 292, 312. Graham (2014: 43) states: 'By seeking the support of the divine world, and the subsequent expression of gratitude with a suitable ex-voto, the child was not only set on a path of socialisation but was also made a member of the religious community which would continue to be involved with other major developments of its life.'

¹²⁹ The model of Learning by Observing and Pitching In (LOPI) was developed by Barbara Rogoff to account for cross-cultural children's learning. The model places an emphasis on learning through observation, collaboration, and active participation by children (under adult guidance) who contribute to community activities. See Rogoff 2014 and Rogoff, Nadjafi and Mejia-Arauz 2014.

¹³⁰ Hobson *et al.* 2017: 15–16.

¹³¹ Wen *et al.* (2020: 5) state that one key purpose of rituals is 'to transmit group norms to new group members' (in this case children).

¹³² Legare and Nielsen 2015: 695, Clegg and Legare 2016, and Legare and Harris 2016: 637.

¹³³ van Mulukom 2017: 200. Herrmann *et al.* (2013: 541) state that: 'Attention to social cues and contextual information is a key component of the development and transmission of cultural knowledge.'

individual's memories are not only situated and extended within their environment, but memories are also shared, constructed, and reconstructed among individuals and within social groups.¹³⁴ This becomes particularly important if we consider the cross-generational process of learning and remembering. As young and relatively inexperienced participants in ritual events, children would have needed the guidance and encouragement of trusted adults during their performance of ritual duties. As the *Nutrices* reliefs appear to display, both children and adults thus collaboratively participated in the ritual proceedings, forming, in the process, distinct yet shared autobiographical memories of the ritual event. These memories of a shared ritual event would have served not only to bond the participants socially and emotionally¹³⁵ but would have also influenced the ways in which the participants remembered the event.

As time passed and children grew up the memory of a specific early childhood event, such as a religious ritual, may have faded, even if that event may have constituted a defining moment of their life (e.g. childhood rite of passage, recovery from a significant illness etc.). However, the trusted adults and family members who participated in the original event alongside the child would have been able to collectively help the child to 'reconstruct' the memory of the event. By collaborating and exchanging details from their own autobiographical memories, the participants would have been able to fill the gaps in each others' memories of the event.¹³⁶ This social, transactive¹³⁷ process of remembering enables the preservation and cross-generational transmission not merely of specific event details, but more importantly, of shared group values. In this respect, religious knowledge, including religious rituals, and the cultural and social values which they embodied, would have been transferred from parents to children, who, in their turn, would have carried on the worship and the memory of the *Nutrices*.

Conclusion

In conclusion, the *Nutrices* were worshipped as healing and protective goddesses whose cult was focused on the family, and especially the well-being of children. Due to this fact, rituals performed within the cult

¹³⁴ Harris *et al.* 2010: 274. ¹³⁵ van Mulukom 2017: 194 and Wen *et al.* 2020: 2.

¹³⁶ Harris *et al.* 2010: 274–5.

¹³⁷ The theory of transactive memory is put forward by Wegner (see Wegner *et al.* 1985 and Wegner 1986). Harris *et al.* (2010: 275) state that 'Transactive memory theory focuses on the way in which socially shared remembering supports memory, and by extension protects against forgetting.'

created and fostered close-knit ties among the community of worshippers and supported the creation of local identities. As the Religious Learning Network (RLN) model has shown, religious rituals were learned and transferred within intimate circles, between family members and the local community of worshippers, from individual to individual, as well as through interaction with objects, places, and events. In this way, emotional bonds combined with repetitive exposure to external stimuli to form a dynamic network of memory associations, which created a narrative within the life-experience of the individual, making it easier to store and retrieve memories of religious rituals.

REFERENCES

- Beck, R. 2004. 'Four men, two sticks, and a whip: image and doctrine in a Mithraic ritual', in H. Whitehouse and L. H. Martin, eds. *Theorizing Religions Past: Archaeology, History, and Cognition*, 87–103. Walnut Creek.
- Belak, M. 1993. 'Med Nutricami in Mitro', in B. Lamut, ed. *Pruijski Arheološki Zbornik Ob 100-letnici muzeja in Muzejskega društva*, 233–9. Ptuj.
- Bourbou, C. and Dasen, V. 2018. 'Enfance en péril: les maladies infantiles à l'époque romaine', *Archéologia* 564: 58–65.
- Boyer, P. and Liénard, P. 2020. 'Ingredients of "rituals" and their cognitive underpinnings', *Philosophical Transactions of the Royal Society B* 375(1805): 20190439. <http://dx.doi.org/10.1098/rstb.2019.0439>
- Carroll, M. 2014. 'Mother and infant in Roman funerary commemoration', in M. Carroll and E. J. Graham, eds. *Infant Health and Death in Roman Italy and Beyond*. Journal of Roman Archaeology. Supplementary Series Number 96, 159–78. Portsmouth.
- Clegg, J. M. and Legare, C. H. 2016. 'A cross-cultural comparison of children's imitative flexibility', *Developmental Psychology* 52(9): 1435–44.
- Clegg, J. M., Wen, N. J., DeBaylo, P. H., Alcott, A., Keltner, E. C. and Legare, C. H. 2021. 'Teaching through collaboration: flexibility and diversity in caregiver-child interactions across cultures', *Child Development* 92(1): e56–e75.
- Connerton, P. 1989. *How Societies Remember*. Cambridge.
- Dasen, V. 2011. 'Childbirth and infancy in Greek and Roman antiquity', in B. Rawson, ed. *A Companion to Families in the Greek and Roman Worlds*, 291–314. Oxford.
- Day, J. 2013. 'Introduction: making senses of the past', in J. Day, ed. *Making Senses of the Past: Toward a Sensory Archaeology*, 1–31. Carbondale.
- Derks, T. 2014. 'Seeking divine protection against untimely death: infant votives from Roman Gaul and Germany', in M. Carroll and E. J. Graham, eds. *Infant Health and Death in Roman Italy and Beyond*. Journal of Roman Archaeology. Supplementary Series Number 96, 47–68. Portsmouth.
- Diez, E. 1993. 'Magna Mater oder Nutrix?', in B. Lamut, ed. *Pruijski Arheološki Zbornik Ob 100-letnici muzeja in Muzejskega društva*, 251–62. Ptuj.

- Dunbar, R. I. M. 2021. 'Religiosity and religious attendance as factors in wellbeing and social engagement', *Religion, Brain & Behavior* 11(1): 17–26. <https://doi.org/10.1080/2153599X.2020.1712618>
- Eagleman, D. and Montague, R. 2002. 'Learning and memory, models of', in L. Nadel, ed. *Encyclopedia of Cognitive Science*, 806–12. London. <https://doi.org/10.1002/0470018860.s00368>
- Eidinow, E. 2022. 'Ancient Greek smellscape and divine fragrances: anthropomorphizing the gods in Ancient Greek culture', in E. Eidinow, A. W. Geertz and J. North, eds. *Cognitive Approaches to Ancient Religious Experience*, 69–95. Cambridge.
- Eidinow, E., Geertz, A. W., Deeley, Q. and North, J. 2022. 'Introduction', in E. Eidinow, A. W. Geertz and J. North, eds. *Cognitive Approaches to Ancient Religious Experience*, 1–16. Cambridge.
- Geertz, A. W. 2017. 'Religious bodies, minds and places: a cognitive science of religion perspective', in L. Carnevale, ed. *Spazi e luoghi sacri espressioni ed esperienze di vissuto religioso*, 35–52. Bari Santo Spirito.
- Graham, E. J. 2014. 'Infant votives and swaddling in Hellenistic Italy', in M. Carroll and E. J. Graham, eds. *Infant Health and Death in Roman Italy and Beyond*. Journal of Roman Archaeology. Supplementary Series Number 96, 23–46. Portsmouth.
- Gurlitt, W. 1896. 'Pettauer antiken. I. Die Nutrices Augustae', *Archäolog.-epigraph. Mittheilungen aus Oesterreich-Ungarn* 19(1): 1–25.
- Hall, C. R., Mack, D., Paivio, A. and Hausenblas, H. A. 1998. 'Imagery use by athletes: development of the sport imagery questionnaire', *International Journal of Sport Psychology* 29: 73–89.
- Hamilakis, Y. 2013. 'Afterword: eleven theses on the archaeology of the senses', in J. Day, ed. *Making Senses of the Past: Toward a Sensory Archaeology*, 409–19. Carbondale.
- Harris, C. B., Sutton, J. and Barnier A. J. 2010. 'Autobiographical forgetting, social forgetting, and situated forgetting: forgetting in context', in S. Della Sala, ed. *Forgetting*, 253–84. Hove.
- Herrmann, P. A., Legare, C. H., Harris, P. L. and Whitehouse, H. 2013. 'Stick to the script: the effect of witnessing multiple actors on children's imitation', *Cognition* 129: 536–43.
- Hobson, N. M., Schroeder, J., Risen, J. L., Xygalatas, D. and Inzlicht, M. 2017. 'The psychology of rituals: an integrative review and process-based framework', *Personality and Social Psychology Review* 00(0): 1–25.
- Högberg, A., Gärdenfors, P. and Larsson, L. 2015. 'Knowing, learning and teaching: how Homo became Docens', *Cambridge Archaeological Journal* 25(4): 847–58.
- Huet, V. 2008. 'L'encens sur les reliefs sacrificiels romains', in L. Bodiou, D. Frère and V. Mehl, eds. *Parfums et Odeurs dans l'Antiquité*, 105–16. Rennes.
- Hull, K. 2014. 'Ritual as performance in small-scale societies', *World Archaeology* 46(2): 164–77.
- Hupbach, A., Gomez, R., Hardt, O. and Nadel, L. 2007. 'Reconsolidation of episodic memories: a subtle reminder triggers integration of new information', *Learning & Memory* 14: 47–53.

- Laidlaw, J. 2004. 'Introduction', in H. Whitehouse and J. Laidlaw, eds. *Ritual and Memory: Toward a Comparative Anthropology of Religion*, 1–9. Walnut Creek.
- Lang, M., Krátký, J., Shaver, J. H., Jerotijević, D. and Xygalatas, D. 2015. 'Effects of anxiety on spontaneous ritualized behavior', *Current Biology* 25: 1892–7.
- Lang, M., Krátký, J. and Xygalatas, D. 2020. 'The role of ritual behaviour in anxiety reduction: an investigation of Marathi religious practices in Mauritius', *Philosophical Transactions of the Royal Society B* 375(1805): 20190431. <http://dx.doi.org/10.1098/rstb.2019.0431>
- Legare, C. H. and Harris, P. L. 2016. 'The ontogeny of cultural learning', *Child Development* 87(3): 633–42.
- Legare, C. H. and Nielsen, M. 2015. 'Imitation and innovation: the dual engines of cultural learning', *Trends in Cognitive Sciences* 19(11): 688–99. <https://doi.org/10.1016/j.tics.2015.08.005>
- Legare, C. H. and Nielsen, M. 2020. 'Ritual explained: interdisciplinary answers to Tinbergen's four questions', *Philosophical Transactions of the Royal Society B* 375(1805): 20190419. <http://dx.doi.org/10.1098/rstb.2019.0419>
- Lyons, D. E., Young, A. G. and Keil, F. C. 2007. 'The hidden structure of overimitation', *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* 104(50): 19751–6.
- Mackey, J. 2017. 'Roman children as religious agents: the cognitive foundations of cult', in V. Vuolanto and C. Laes, eds. *Children and Everyday Life in the Roman and Late Antique World*, 179–97. London.
- Martin, L. H. 2022. 'Identifying symptoms of religious experience from ancient material culture: the example of cults of the Roman Mithras', in E. Eidinow, A. W. Geertz and J. North, eds. *Cognitive Approaches to Ancient Religious Experience*, 218–42. Cambridge.
- McCauley, R. N. 2020. 'Recent trends in the cognitive science of religion: neuroscience, religious experience, and the confluence of cognitive and evolutionary research', *Zygon* 55(1): 97–124.
- Misic, B. 2015. 'Cognitive theory and religious integration: the case of the Poetovian Mithraea', in T. Brindle, M. Allen, E. Durham and A. Smith, eds. *TRAC 2014. Proceedings of the Twenty-Fourth Annual Theoretical Roman Archaeology Conference, Reading 2014*, 31–40. Oxford. http://doi.org/10.16995/TRAC2014_31_40
- Misic, B. 2022. 'Worship of the Nymphs at *Aquae Iasae* (Roman Pannonia Superior): cognition, ritual and sacred space', in M. Henig and J. Lundock, eds. *Water in the Roman World: Engineering, Trade, Religion and Daily Life*, 157–74. Oxford.
- Montague, R., Eagleman, D., McClure, S. and Berns, G. 2002. 'Reinforcement learning: a biological perspective', in L. Nadel, ed. *Encyclopedia of Cognitive Science*, 908–13. London. <https://doi.org/10.1002/0470018860.s00373>
- Moser, C. 2019. *The Altars of Republican Rome and Latium. Sacrifice and the Materiality of Roman Religion*. Cambridge.
- Nielsen, M., Kapitány, R. and Elkins, R. 2015. 'The perpetuation of ritualistic actions as revealed by young children's transmission of normative behavior',

- Evolution and Human Behavior* 36(3): 191–8. <https://doi.org/10.1016/j.evolhumbehav.2014.11.002>
- Panagiotidou, O. and Beck, R. 2017. *The Roman Mithras Cult: A Cognitive Approach*. London.
- Rogoff, B. 2014. 'Learning by observing and pitching in to family and community endeavors: an orientation', *Human Development* 57: 69–81.
- Rogoff, B., Najafi, B. and Mejía-Arauz, R. 2014. 'Constellations of cultural practices across generations: indigenous American heritage and learning by observing and pitching in', *Human Development* 57: 82–95.
- Rossano, M. J. 2020. 'Ritual as resource management', *Philosophical Transactions of the Royal Society B* 375(1805): 20190429. <http://dx.doi.org/10.1098/rstb.2019.0429>
- Rüpke, J. 2020. 'Establishing self-world relations in socio-religious practices: looking at Roman religious communication', *ARYS* 18: 19–50.
- Sara, S. J. 2000. 'Retrieval and reconsolidation: toward a neurobiology of remembering', *Learning & Memory* 7: 73–84.
- Siebert, A. V. 2015. 'Instruments and vessels', in R. Raja and J. Rüpke, eds. *A Companion to the Archaeology of Religion in the Ancient World*, 388–96. Oxford.
- Sosis, R. 2020. 'The last Talmudic demon? The role of ritual in cultural transmission', *Philosophical Transactions of the Royal Society B* 375(1805): 20190425. <http://dx.doi.org/10.1098/rstb.2019.0425>
- Sutton, J. 2020. 'Place and Memory: History, Cognition, Phenomenology', in G. A. Sullivan and M. Floyd-Wilson, eds. *Geographies of Embodiment in Early Modern England*, 113–33. Oxford.
- Šašel-Kos, M. 1999. *Pre-Roman Divinities of the Eastern Alps and Adriatic*. Ljubljana.
- Šašel-Kos, M. 2016. 'Nutrices: the most popular goddesses at Poetovio', in M. Lehner and B. Schrettle, eds. *Zentralort und Tempelberg: Siedlungs- und Kultentwicklung am Frauenberg bei Leibnitz im Vergleich*, 167–74. Wien.
- Tulving, E. and Thomson, D. 1973. 'Encoding specificity and retrieval processes in episodic memory', *Psychological Review* 80(5): 352–73.
- Van Cappellen, P. and Edwards, M. E. 2022. 'The embodiment of worship: relations among postural, psychological, and physiological aspects of religious practice', in A. W. Geertz, L. Ambasciano, E. Eidinow, L. H. Martin, K. Laigaard Nielbo, N. P. Roubekas, V. van Mulukom and D. Xygalatas, eds. *Studying the Religious Mind: Methodology in the Cognitive Science of Religion*, 115–38. Sheffield.
- Van der Ploeg, G. 2016. 'Reconstructing the sensory experience of Caracalla's supplication at the Pergamene Asclepieion', *Exchanges: The Warwick Research Journal* 3(2): 185–98.
- van Mulukom, V. 2017. 'Remembering religious rituals: autobiographical memories of high-arousal religious rituals considered from a narrative processing perspective', *Religion, Brain & Behavior* 7(3): 191–205. <https://doi.org/10.1080/12153599X.2016.1232304>

- Weddle, C. 2013. 'The sensory experience of blood sacrifice in the Roman imperial cult', in J. Day, ed. *Making Senses of the Past: Toward a Sensory Archaeology*, 137–59. Carbondale.
- Wegner, D. M. 1986. 'Transactive memory: a contemporary analysis of the group mind', in B. Mullen and G. R. Goethals, eds. *Theories of Group Behaviour*, 185–208. New York.
- Wegner, D. M., Giuliano, T. and Hertel, P. T. 1985. 'Cognitive interdependence in close relationships', in W. Ickes, ed. *Compatible and Incompatible Relationships*, 253–76. New York.
- Wen, N. J., Willard, A. K., Caughy, M. and Legare, C. H. 2020. 'Watch me, watch you: ritual participation increases in-group displays and out-group monitoring in children', *Philosophical Transactions of the Royal Society B* 375 (1805): 20190437. <https://doi.org/10.1098/rstb.2019.0437>
- White, C. 2021. *An Introduction to the Cognitive Science of Religion. Connecting Evolution, Brain, Cognition, and Culture*. New York.
- Whitehouse, H. 2004. *Modes of Religiosity: A Cognitive Theory of Religious Transmission*. Lanham, MD.
- Whitehouse, H. and Laidlaw, J. 2004. *Ritual and Memory: Towards a Comparative Anthropology of Religion*. Walnut Creek.
- Wigand, K. 1915. 'Die Nutrices Augustae von Poetovio', *Jahreshefte des Österreichischen Archäologischen Institutes* 18: 188–218.
- Xygalatas, D. 2022. *Ritual. How Seemingly Senseless Acts Make Life Worth Living*. New York.