COGNITIVE SCIENCE IN BIBLICAL STUDIES: AN OVERVIEW

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1. Introduction

During the past decades, even scholars within various disciplines in the social sciences, humanities and the arts have become more interested in the cognitive functions of the mind. It remains the task of future philosophers and historians to analyze in more detail the reasons for this rapidly spreading movement which seems to belong to the category of cultural phenomena that sometimes are so universal that one bumps into them at every turn. One quite obvious incentive might be the fact that within the past decades, our everyday life[1] has become thoroughly computerized. Basic skills in information technology are necessary for successful life management in the present information society. We need to know something of the way in which information is stored, processed and retrieved in the "minds" of computers that are the immediate interface through which we manage our everyday life at work and in our free time.

On the one hand, computers effect to ways how we intuitively picture the "processors" in the brains of our colleagues, neighbors and family members. On the other hand, we easily attribute human characteristics to those electronic "minds," because our brain has evolved in an environment where the only "machines" with which we have interacted on an input-process-respond–basis have been the minds of our fellow humans. All this is further boosted by developing brain imaging techniques which produce more and more accurate information on the factual neurological processes in the brain. First computers provided impetus for the birth of cognitive science (more on this below), and computerized everyday life makes this analogy appealing to even larger groups.

In the beginning of the 1990s, some scholars of comparative religion, many of them with backgrounds in anthropology, became interested in applying cognitive science in their own scholarly work. This gave birth to the branch of scholarship that is nowadays usually called the cognitive science of religion (CSR). Because this area of research is growing all the time, it is impossible to get a clear picture of all the research that is growing under this umbrella term. It is clear that Dan Sperber's[2] cognitively oriented anthropological theorizing, which has inspired many CSR scholars, forms the background. It is also clear that Thomas Lawson's and Robert McCauley's as well as Harvey Whitehouse's theories of ritual[3] and Pascal Boyer's work[4] are

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[1] I am using here "everyday life" in the sense of Peter Berger's and Thomas Luckmann's sociology of knowledge where it refers to reality that people take for granted in their "everyday lives" —although reality is always socially constructed. Cf. Peter L. Berger and Thomas Luckmann, *Social Construction of Reality: A Treatise in the Sociology of Knowledge* (London: Allen Lane, 1966), 35-37.

[2] Dan Sperber and Deirdre Wilson, *Relevance: Communication and Cognition* (Cambridge, MA: Harvard University Press, 1986); Dan Sperber, *Explaining Culture: A Naturalistic Approach* (Oxford: Blackwell, 1996).

[3] E. Thomas Lawson and Robert N. McCauley, *Rethinking Religion: Connecting Cognition and Culture* (Cambridge: Cambridge University Press, 1990); Robert N. McCauley and E. Thomas Lawson, *Bringing Ritual to Mind* (Cambridge: Cambridge University Press, 2002); Harvey Whitehouse, *Arguments and Icons: Divergent Modes of Religiosity* (Oxford: Oxford University Press, 2000); Harvey Whitehouse, *Modes of Religiosity: A Cognitive Theory of Religious Transmission* (Walnut Creek, Calif.: AltaMira, 2004).

[4] Pascal Boyer, *Religion Explained: The Human Instincts that Fashion Gods, Spirits and Ancestors* (London: Vintage, 2002); For summary, see Pascal Boyer, "Cognitive Predispositions and Cultural Transmission," in *Memory in Mind and Culture* (eds. Pascal Boyer and James V. Wertsch; Cambridge: Cambridge University Press, 2009), 288-319.

already among the classic CSR studies. Clearly, the research conducted in Århus at the Religion, Cognition and Culture (RCC) research unit also belongs in the area of the CSR. The International Association for the Cognitive Science of Religion (IACSR) was established in 2006 with the explicit goal "to promote the cognitive science of religion through international collaboration of all scholars whose research has a bearing on the subject."[5] Thus, the research and scholars associated with the IACSR may give a rough picture of what counts as CSR today. On the other hand, the mission statement of the IACSR suggests that the borders are not clear cut; there is much research out there that has "bearing on the subject."

Although the term CSR is quite broad, in this overview I do not want to label all cognitively oriented research on religion as the cognitive science of religion. This is mainly due to the fact that cognitive considerations play a role in some approaches within biblical studies that—despite their multidisciplinary orientation towards cognitive science—are characterized more appropriately by their primary disciplines. Thus, the following discussion has three main sections. After a short introduction to cognitive science, I introduce the so-called "blending theory" in cognitive linguistics, since cognitive science started to make its way into the methodological tool box of biblical scholars at approximately the same time through cognitive linguistics and the CSR. The second main section deals with classic themes and studies within the CSR, in order to characterize the basics of the CSR discourse for theologians and biblical scholars who are in the process of familiarizing themselves with this area of research. For this reason, my focus lies in the areas within the CSR which have first drawn the attention of scholars interested in biblical and related traditions.[6] The third section introduces the use of cognitive science and neuroscience in the context of social-scientific criticism, especially the so-called "social identity approach." This leads to the conclusion of the article where I argue for the need to combine the cognitive science approach with the analysis of social and cultural factors.[7] In my view, cognitive science needs to be applied in a wider socio-cognitive framework within biblical studies if it is not to become prone to same ideological fallacies which characterized the heyday of redaction criticism.

What follows is not an exhaustive listing of all cognitive approaches and research that is underway in biblical studies. Nevertheless, the themes that I have chosen to focus on should give a relatively broad picture of the areas where cognitive science can contribute to biblical studies. At the same time, the themes also introduce the key areas of interest in the Nordic network Socio-Cognitive Perspectives on Early Judaism and Early Christianity (NordForsk funding for 2010-2013).[8]

2. What is Cognitive Science?
The beginnings of cognitive science can be traced back to the mid-1950s when scholars started to again pay more attention to mental representations and the cognitive operations of the mind, after behaviorism's one-sided focus on simple impulse-reaction correspondences. Memory re-

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[5]   http://www.iacsr.com/iacsr/Home.html (cited 13.9.2011).

[6]   Armin Geertz's contribution in this volume offers a wider perspective on the CSR.

[7]   In this regard, the "socio-cognitive" approach that we have applied in biblical studies at the University of Helsinki coheres with the goals of the Religion, Cognition and Culture research unit at Aarhus. Cf. Armin Geertz, "Too Much Mind and Not Enough Brain, Body and Culture: On What Needs to be Done in the Cognitive Science of Religion," *Historia Religionum. An International Journal* 2 (2010): 21-37. In Helsinki, the application of the CSR in biblical studies has been inspired by and has greatly benefited from the work of Ilkka Pyysiäinen. My own introduction to the CSR was Ilkka Pyysiäinen, *How Religion Works: Towards a New Cognitive Science of Religion* (Leiden: Brill, 2001).

[8]   The network aims at strengthening cooperation and contacts between biblical scholars and scholars of religion in two methodologically progressive areas of religious studies in the Nordic countries: 1) The cognitive science of religion and the application of cognitive sciences in general and (2) Social-scientific, especially the social identity approach to early Christianity and early Judaism. For further information, see http://www.helsinki.fi/teol/pro/scnetwork/.

search had shown the limited capacity of short-term memory and the importance of mental scripts through which the mind is able to categorize, organize and manipulate the practically infinite flow of sensory data. This coincided with the emergence of research on artificial intelligence which was inspired by the introduction of the first computers. In the area of linguistics, Noam Chomsky introduced the idea of generative grammar which—challenging behaviorist explanations of language acquisition—assumes a special module in the mind with a capacity to learn languages on the basis of innate universal grammar. Today, cognitive science has grown into an interdisciplinary study of mind and intelligence, including philosophy, psychology, artificial intelligence, neuroscience, linguistics, anthropology and ethology.[9]

Because cognitive science is a multidisciplinary research area, it follows that it has several possible points of contact with biblical studies which has also experienced a flood of new methodological approaches during the recent decades. In the following, I give some examples of areas where cognitive science has provided new impulses for research but it is clear that there are many more areas that may also benefit from research conducted in this broad collection of disciplines with cognitive orientation.

3. Blending theory

The first example comes from the field of cognitive linguistics where Gilles Fauconnier and Mark Turner have developed a theory known as conceptual blending—or mental binding or conceptual integration, or simply as blending theory.[10] The blending theory builds on George Lakoff and Mark Johnson's earlier work on metaphors which has highlighted the constitutive role that metaphors have in human thinking—they are not just rhetorical decoration. In Lakoff and Johnson's definition "The essence of metaphor is understanding and experiencing one kind of thing in terms of another."[11] Metaphorical correspondence is always only partial, which makes it possible to extend the meaning of what is described metaphorically. For instance, if we think of ideas as objects "we can *dress them up in fancy clothes, juggle them, line them up nice and neat, etc.*"[12]

Metaphor theory has developed over the years and especially its later forms emphasize the embodied character of primary metaphors that are grounded on everyday sensory-motor experience of physical and social environment. Thus, metaphors create mappings between two conceptual domains but the mappings are not arbitrary. They are constrained and guided by experiences in the world. Some primary metaphors are universal since they arise from the way our bodies interact with the physical environment. "Affection is Warmth" is a primary conceptual metaphor which is rooted in the early feelings of warmth when being held closely. Furthermore, the theory has also been connected with neural mapping, which enforces the idea that metaphor is a neural phenomenon. "You do not have a choice as to whether to think metaphorically. Because metaphorical maps are part of our brains, we will think and speak metaphorically whether we want to or not."[13]

Fauconnier and Turner's blending theory can be understood as an elaborated description of

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9   For overview of cognitive science, see Paul Thagard, "Cognitive Science" in *Stanford Encyclopedia of Philosophy* 2010; available at http://plato.stanford.edu/archives/sum2010/entries/cognitive-science/ (cited 09/2011). Thagard, however, does not include ethology in his listing of disciplines.

10   Gilles Fauconnier and Mark Turner, "Conceptual Integration Networks," *Cognitive Science* 22, no. 2 (1998): 133-187; Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (New York: Basic Books, 2002).

11   Georg Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 2003 [=1980]), 5.

12   Ibid., 13.

13   Ibid., 254-259, especially 257.

metaphorical mappings. The difference between simple metaphors and the blending theory is that when metaphors describe one domain in the terms of another, the blending theory operates with several intermingling "spaces." In Lakoff and Johnson's view, the theories also have a different focus: the blending theory operates on a conceptual level but their metaphor theory, especially in its later form that has been integrated with the Neural Theory of Language, is more concerned with neural computations.[14]

Blending requires the so-called "generic space," at least two input spaces, and the blended space. The generic space includes the abstract structure common to the two or more input spaces. The blended space, for its part, displays the end product, the blend. Although the minimum is two input spaces, in many cases there are several input spaces involved and the blends can serve as inputs in new blending processes.

Blending theory
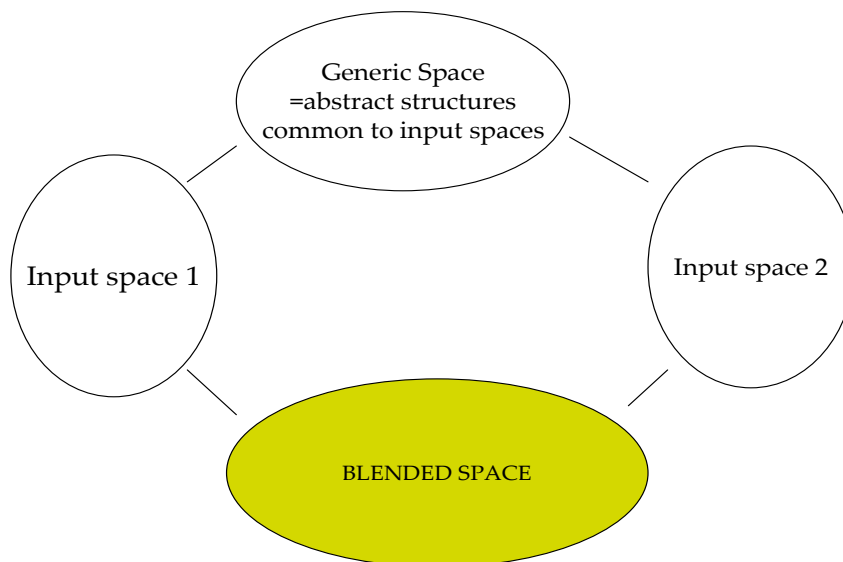
Fauconnier and Turner present the common metaphor "digging one's own grave" as an example of conceptual blending where one input space consist of the present foolish actions of a person, who, for instance, makes risky investments in the stock market. The other input space is the concrete world of the gravediggers who usually prepare graves for others. The generic space can be conceived as an abstract scheme of preparatory actions. In the blended space, these come together creating a new space with unexpected causal effects (and unwanted from the investor's point of view).[15]

An important feature of Fauconnier and Turner's theory is that while the input spaces are tapped into long term conceptual structures (in the long-term memory), the blended spaces are not stable structures. They are constructed as "we think and talk, for purposes of local understanding and action" and they can be modified as discourse unfolds.[16] Thus, the theory is essentially about conceptual integration. However, the dynamic character of the blended spaces makes it possible also to apply the theory in the analysis of narratives where metaphors interact and

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[14]   For the relation of the two theories, see especially Ibid., 261-264.

[15]   Fauconnier and Turner, "Conceptual Integration Networks," 149-151.

[16]   Ibid., 137.

develop as the story unfolds.

Although some of the primary metaphors are universal, it is clear that much of the metaphorical everyday discourse is culturally determined. In the area of early Christian studies, Vernon K. Robbins has applied the blending theory in conjunction with the socio-rhetorical analysis that he has been developing since the 1990s. Robbins distinguishes six different early Christian rhetorolects that provide the cultural frames for blending processes: wisdom, prophetic, apocalyptic, precreation, miracle and priestly rhetorolect. Robbins' ambitious goal is to create an overall description of the types of blends connected to each of these six rhetorolects. In this context, it is not possible to describe this (quite elaborate) model in detail but the following table summarizes the key idea:

Generic Spaces	Conceptual mental spaces
Experienced Spaces (Firstspace)	Experiences of the body in social places
Conceptual Spaces (Secondspace)	Sensory-aesthetic and cognitive experiences creating cultural, religious, and ideological places
Spaces of Blending (Thirdspace)	Debate, reconciliation, elaboration and avoidance in relation to cultural, religious and ideological places

Cultural frames provide the "dialects," i.e., rhetorolects in which the blending occurs. The firstspace and the secondspace in the table represent the basic two input spaces in the "minimal" model of conceptual blending. The first one is more concrete and the second one more conceptualized. For instance, in the apocalyptic rhetorolect, the firstspace includes political empire, imperial temple and imperial army. The secondspace pictures God as almighty, Jesus as the Son of Man, King of King and Lord of Lords. In the blended space, the human body is understood as the recipient of resurrection and eternal life in a new realm of well being.[17]

Robbins' model is theoretically well grounded and it is to be credited for creating a link between cognitive processes and cultural discourse. It is also clear that the six rhetorolects provide possibilities for describing a large variety of blends. However, it remains to be seen whether Robbins' grid manages to capture meaningful aspects of early Christian discourse or if the factual blending processes are so multidimensional, layered and proliferating that they elude all overall descriptions. Nevertheless, it is also possible to apply blending theory in a more piecemeal fashion in the analysis of individual texts and narratives. Even in these more modest frameworks, Robbins' model with its emphasis on cultural context and with its six basic rhetorolects may provide helpful starting points for analysis.

4. The Cognitive Science of Religion (CSR)

As noted above, the boundaries of the CSR are not clear-cut. In terms of scholarly disciplines, the field is very new and it remains to be seen how well it succeeds in maintaining its own separate identity, and if, indeed, such a separate identity is necessary and beneficial for the application of cognitive science in research on religion. The field of research started to emerge in the beginning of the 1990s but it took about ten years before the term "the cognitive science of religion" became established as the standard title for this branch of research.[18] Today, it is possible

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17   For an overview of Robbins' model, see, for instance, Vernon K. Robbins, "Conceptual Blending and Early Christian Imagination," in *Explaining Christian Origins and Early Judaism: Contributions from Cognitive and Social Science* (eds. Petri Luomanen, et al.; Biblical Interpretation 89; Leiden: E. J. Brill, 2007), 161-195.

18   In this regard, E. Thomas Lawson, "Towards a Cognitive Science of Religion," *Numen* 47, no. 3 (2000):

to characterize the CSR as a multidisciplinary research area which includes approximately the same disciplines as cognitive science in general.

However, usually the listings of disciplines applied in the CSR include one notable addition: evolutionary psychology. Evolutionary considerations have clearly played a more central role in the CSR than in cognitive science in general. This is mainly due to the fact that some of the first influential works, especially by Pascal Boyer,[19] have drawn heavily on the research program of Leda Cosmides and John Tooby who find evolutionary theorizing essential for cognitive psychology.[20] However, the approach is controversial,[21] and it is clear, for instance, that neuroscience can offer much more useful and less ambiguous information for the CSR than evolutionary considerations about the possible original functions of assumed cognitive modules. I agree here with Justin Barrett who finds the relation of the CSR and evolutionary psychology more "opportunistic than necessary." Evolutionary psychology may sometimes contribute to the depth of explanations but it is not the most essential element.[22]

According to Justin Barrett, the CSR is generally characterized by "a piecemeal approach, explanatory non-exclusivism, and methodological pluralism."[23] For Barrett, the piecemeal approach means that the CSR is interested in

> identifying human thought or behavioral patterns that might count as 'religious' and then trying to explain why those patterns are cross-culturally recurrent. If the explanations turn out to be part of a grander explanation of 'religion', so be it. If not, meaningful human phenomena have still been rigorously addressed.

Explanatory non-exclusivism, for Barrett, means that the CSR does not claim to provide exhaustive explanations of religion but calls for scholars from other disciplines to fill in their own historical, anthropological, psychological, sociological and other relevant information. Methodological pluralism refers to the use of all necessary modes of analysis from the study of archaeological and historical records to present day interviews and experiments.[24]

Barrett's "piecemeal approach" is perhaps an apt characterization of what is currently happening in the field, when the CSR has proceeded to concrete testing of specific hypotheses concerning the cognitive processing of religious representations. On the other hand, the theories that have been put forward by Harvey Whitehouse as well Thomas Lawson and Robert McCauley are quite encompassing, as will become clear in the following section where I introduce some examples of the central concepts of the CSR—first through the foundational works of Sperber and

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338-349, and Justin L. Barrett, "Exploring the Natural Foundations of Religion," *Trends in Cognitive Sciences* 4, no. 1 (2000): 29-34, can be counted as landmarks.

[19]   Pascal Boyer, *Religion Explained;* Boyer, "Religion, Evolution, and Cognition". In Boyer's paradigm, evolutionary theorizing and analysis of religious transmission go necessarily hand in hand because he sees religion as a by-product. See, for instance, Pascal Boyer, "Cognitive Predispositions," 288-319.

[20]   Leda Cosmides and John Tooby, "Beyond Intuition and Instinct Blindness: Toward an Evolutionarily Rigorous Cognitive Science," *Cognition* 50, no. 1-3 (1994): 41-77; John Tooby and Leda Cosmides, "Evolutionizing the Cognitive Sciences: A Reply to Shapiro and Epstein," *Mind & Language* 13, no. 2 (1998): 195; John Tooby and Leda Cosmides, "Evolutionary Psychology, Ecological Rationality, and the Unification of the Behavioral Sciences," *Behavioral and Brain Sciences* 30, no. 01 (2007): 42-43.

[21]   Robert C. Richardson, *Evolutionary Psychology as Maladapted Psychology* (Cambridge, Mass.: MIT Press, 2007).

[22]   Justin L. Barrett, "Cognitive Science of Religion: What Is It and Why Is It?," *Religion Compass* 1, no. 6 (2007): 768-786, esp. 779.

[23]   Ibid., 768.

[24]   Ibid., 768-769.

Boyer followed by Whitehouse's as well as Lawson and McCauley's ritual theories.

5. Key concepts in the CSR: Epidemiology, attraction, modularity and counterintuitiveness

Epidemiology
The main thrust of Dan Sperber's epidemiology of cultural representations is to explain why some ideas in a culture are more successful, more "contagious" than others. In this regard, Sperber's epidemiology resembles the idea of "memes" that Richard Dawkins has popularized as a cultural counterpart for genes as carriers of biological information.[25] However, although Sperber also acknowledges Darwinian selection in biology, he finds Dawkins' meme theory defective for understanding cultural evolution. Sperber compares the spread of ideas with that of diseases but his epidemiology differs from the spread of virus infections in some important respects. First, the use of epidemiological language does no imply that the spread of cultural phenomena would be somehow pathological. Second, in contrast to viruses and other pathogenic agents that usually produce copies of themselves, being seldom susceptible to mutation, mental representations are usually transformed in the process of communication. Stability is exceptional in the transmission of cultural representations. This is also one of the main reasons why Sperber finds Dawkins' meme theory too simple.[26] If the rule in cultural transmission is mutation, the main problem turns out to be why—despite the constant tendency to mutate—there exists stability in cultural transmission and why certain types of representations seem to have successfully spread in and across different cultures.

Modularity
Sperber's approach—and the cognitive approach to religion in general—includes an important presupposition about the function of human memory. Sperber follows Jerry Fodor by assuming that in the human mind, there are genetically programmed modules specialized in processing certain types of information. For instance, the basic concepts of "living things," "artifacts" or "color" are based on such innate schemes.[27]

Several experiments conducted with patients whose brains are partly damaged have indicated that there have to be different systems in the brain that process information connected, for instance, to living things and artifacts (or tools). However, although there seems to be a general consensus that semantic memory (or generic memory) includes these kinds of specialized modules, there is no definite view how many modules one would have to presuppose, what the exact nature of these modules is, and to what extent there is overlap between the modules. For instance, although there are experiments that support the distinction between living and non-living things suggesting two different modules respectively, other experiments have suggested that the modules responsible for selective difficulties in recognizing living and non-living things are actually systems that process either visual or functional information about objects.[28] Thus, there seems to be enough evidence to justify theorizing in terms of different modules, especially con-

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[25]   Richard Dawkins, *The God Delusion* (London: Bantam Press, 2006). Dawkins' memes are espoused by Daniel Dennett. See, for instance, Daniel Dennett, *Breaking the Spell: Religion as Natural Phenomenon* (London: Penguin Books, 2007), 341-357. For a perceptive review of Dawkins and Dennett, see Armin Geertz, "New Atheistic Approaches in the Cognitive Science of Religion: On Daniel Dennett, Breaking the Spell (2006) and Richard Dawkins, The God Delusion (2006)," in *Contemporary Theories of Religion* (ed. Michael Strausberg; Oxon: Routledge, 2009), 242-263.

[26]   Dan Sperber, *Explaining Culture*, 25-26, 57-61. For Sperber's critique of Dawkins and simple application of biological evolution to culture, see Ibid., 3, 82-83, 100-106.

[27]   Ibid., 8, 69, 123-129. Sperber also argues for cultural diversity on the basis of modules: modules that have their original domain elsewhere gain a new *cultural domain* with a proliferation of new representations. Ibid., 138-146.

[28]   See, for instance, Michael S. Gazzaniga, et al., *Cognitive Neuroscience: The Biology of the Mind* (New York: W.W. Norton & Company, 2002), 221-226, 355-360.

cerning the basic level categories, which must be relatively old in an evolutionary perspective. However, it is important to keep in mind that these modules are just rough conceptualizations of what actually happens in a very complicated web of firing neurons.[29]

Attraction model
As was noted above, Sperber sees the psychological condition of attraction as one of the most important conditions for the survival of cultural representations. Attraction also plays a significant role in Sperber's critique of Dawkins' meme theory for which he offers an alternative with his own *attraction model*. In this model, attraction is not just a general term for psychological appeal but an innate predisposition towards such cultural items that people find attractive because they resonate with panhuman cognitive architecture. The basic idea is that in cultural transmission, transformations are not random but biased towards forms that people find naturally appealing, because they correspond to their innate cognitive modules.[30] Sperber's emphasis on relevance in cultural transmission also surfaces in the attraction model. In Sperber's (and Dreidre Wilson's) view, one of the factors that make cultural representations relevant for people is the ease with which they can be processed. This is because humans seek to maximize their cognitive efficiency ("as much cognitive effect as possible, for as little mental effect as possible").[31] In the following, we will come back to attraction in Harvey Whitehouse's modes of religion theory .

Counterintuitive concepts
Sperber notes that ideas that go against commonsense rationality and innate modules are attention grabbing and easier to remember.[32] Pascal Boyer has further developed this notion, advocating the idea that religious traditions are characterized by *counterintuitive* representations.[33] The idea of counterintuitiveness is based on the assumption about a panhuman intuitive ontology which consists of intuitions concerning such ontological domains as person, animal, plant, and artifact.[34] Notably, these ontological domains consist of concepts that are generally though to be represented by the above-discussed specialized modules in the semantic memory.

Counterintuitiveness means that an object is intuitively assigned to an ontological category but is also understood to contain some elements that contradict the expectations that people naturally have about the objects belonging to that intuitive category. Intuitive expectations are spontaneous; people are not usually conscious of having them.

Several empirical experiments indicate that minimally counterintuitive concepts are recalled better that intuitive ones. "Minimally counterintuitive" means that the concept basically corresponds to our intuitive expectations but there is one "tweak" in the concept, either an extra quality or a missing feature that runs counter to our intuitive expectations.[35] A flying worm or a

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[29]   For a critical discussion of modularity in the CSR, see also Aku Visala, *Religion Explained? A Philosophical Appraisal of the Cognitive Science of Religion* (Doctoral thesis, University of Helsinki, 2009) 32-41.

[30]   Sperber, *Explaining Culture,* 106-118.

[31]   Ibid., 114; Sperber and Wilson, *Relevance*.

[32]   Sperber, *Explaining Culture*, 70-74, 140.

[33]   Similarly Justin L. Barrett, *Why Would Anyone Believe in God?* (Walnut Creek, CA: AltaMira Press, 2004), 21-30.

[34]   Pascal Boyer, *The Naturalness of Religious Ideas: A Cognitive Theory of Religion* (Berkeley: University of California Press, 1994), 101; Pascal Boyer, "Cognitive Tracks of Cultural Inheritance: How Evolved Intuitive Ontology Governs Cultural Transmission," *American Anthropologist* 100, no. 4 (1998): 876-89, esp. 878; Boyer, *Religion Explained*, 69-79.

[35]   Ibid., 84-87; Boyer, "Cognitive Predispositions," 288-319, 294-295; Scott Atran and Ara Norenzayan, "Religion's Evolutionary Landscape: Counterintuition, Commitment, Compassion, Communion," *Behavioral and*

talking birch tree would count as examples of counterintuitive concepts. However, the evidence about the better recall for counterintuitive concepts than for intuitive ones is not unequivocal. It seems that context and background information create expectations on the basis of which counterintuitivity is either experienced or not. A reader of science fiction entertains different intuitive expectations about the characters in a story than a reader of Time magazine.[36] Furthermore, in religious literature, counterintuitivity may appear more like a rule than exception in which case counterintuitivity may turn into intuitivity.[37] For instance, many Christian readers would probably find a healing story where Jesus, time after time, fails to heal more counterintuitive and therefore more memorable than an ordinary biblical healing story.

In addition to counterintuitiveness, which could partly explain our fascination for supernatural beings, CSR scholars have theorized with the so-called "hypersensitive agency detection device" (HADD). The concept is based on the observation that people easily attribute sudden changes in the environment—such as surprising sounds and movements—to the activity of some agents. The existence of HADD is explained on the basis of evolution: alarms, even if sometimes false, have secured better survival.[38]

6. Whitehouse and Lawson & McCauley

Harvey Whitehouse's modes of religiosity theory argues for two main modes of religiosity, the *doctrinal mode* and the *imagistic mode*, both characterized by a dozen of psychological and socio-political variables.[39] The doctrinal mode of religion relies heavily on the *semantic memory* whereas the imagistic mode is closely associated with the functions of the *episodic memory*.

In the doctrinal mode of religion, rituals tend to be highly routinized. In practice, routinized rituals entail that ritual actions are automated to such a degree that they have become part of *implicit memory*. As such, they can facilitate the transmission of complex doctrines that can be more easily remembered if repeated over and over again. However, the other side of the coin is that if people participate in religious services "on autopilot," they may become bored. Whitehouse calls this the *tedium effect*. In a nutshell, the doctrinal mode of religion is characterized by frequent rituals, low emotional arousal, complex religious teachings, centralized institutional arrangements and dynamic leadership.[40]

The imagistic mode of religion is characterized by rarely performed ritual actions (low frequency), which, however, include elements that cause high emotional arousal, such as ecstatic practices, violent initiation rituals or experiences of altered state of consciousness. Low frequency and high emotional arousal trigger episodic memories.

Brain Sciences 27, (2004): 713–30, esp. 722; Justin L. Barrett, *Why Would Anyone,* 22-24.

[36] One should note here that the counterintuitivity in regard to innate cognitive structures is a cognitive phenomenon whereas the context-dependant counterintuitivity is more social in character. Scholars have not perhaps paid enough attention to this difference, but in the present context it is not possible to deal with this question in more detail (I owe this critical remark to Jutta Jokiranta).

[37] Lauren O. Gonce, et al., "Role of Context in the Recall of Counterintuitive Concepts," *Journal of Cognition & Culture* 6, no. 3/4 (2006): 521-547. For discussion, see also Petri Luomanen, et al., 2Introduction: Social and Cognitive Perspectives in the Study of Christian Origins and Early Judaism," in *Explaining Christian Origins and Early Judaism: Contributions from Cognitive and Social Science* (eds. Petri Luomanen, et al.; Biblical Interpretation 89 ; Leiden: Brill, 2007), 1-33, esp. 4-6. (I owe my knowledge of this discussion to Ilkka Pyysiäinen).

[38] The idea was originally introduced by Stewart Guthrie, *Faces in the Clouds: A New Theory of Religion* (Oxford: Oxford University Press, 1993), but HADD is Justin Barrett's term (see Barrett, *Why Would Anyone,* 31-44) that is used also by other CSR scholars. See, for instance, Boyer, *Religion Explained*, 164-166.

[39] Whitehouse, *Modes of Religiosity,* 74. In 1995, Whitehouse counted 13 variables, with slightly different headings. See Harvey Whitehouse, *Inside the Cult: Religious Innovation and Transmission in Papua New Guinea* (Oxford: Clarendon Press, 1995), 197.

[40] Whitehouse, *Modes of Religiosity*, 64-70.

In Whitehouse's theory, the imagistic and doctrinal modes are conceived as two "attractor positions around which ritual actions and associated religious concepts cumulatively tend to cluster. Innovations remote from these attractor positions cannot survive."[41] Whitehouse consents that in the real world, there are no pure forms of doctrinal or imagistic modes of religion. In practice, religions are mixtures of doctrinal and imagistic modalities. This discrepancy between the factual religions and the presumed tendency to gravitate towards attractor positions makes it difficult to understand what Whitehouse's theory actually predicts. If given enough time, would we finally have only imagistic and doctrinal religions? One becomes even more confused when one learns that, according to Whitehouse, lay versions of world religions may actually settle around the cognitive optimum position, (religion is easy and natural –position), thus migrating away from the two modal attractor positions.[42]

According to Whitehouse, in contrast to his own theory, "most other cognitive theories of religion" focus on the ways in which implicit and intuitive knowledge guides the transmission of religious knowledge. Whitehouse calls this "cognitive optimum position" (and "religion is natural" camp). In contrast, Whitehouse argues that religion also typically struggles against the constraints of intuitive cognition. Furthermore, it is precisely these cognitively costly parts of religion that enable the acquisition of religious revelation and expert knowledge, without which no religion can survive in the long run.[43] Consequently, the key question in Whitehouse's theory is how religions succeed in transmitting these kinds of cognitively costly representations. Thus, perhaps one can understand Whitehouse's theory (in its latest form) better if one does not picture the attractor positions as predicted directions of development but as two possible sources for religious expert knowledge and revelation, sort of "wells of religious expert knowledge" around which religious practices and social structures need to cluster in order to arm religions with much-needed cognitively costly traditions.[44]

McCauley and Lawson's ritual competence theory was originally inspired by Noam Chomsky's generative linguistics. Consequently, McCauley and Lawson presume that people have an innate competence for religious rituals. However, the ritual competence does not rely on such a specific module in the brain like the linguistic competence. Ritual competence is based on a more general action representation system which is not restricted only to religious rituals but characterizes the representation of all actions.[45]

The basic idea is that somebody does something (possibly by means of an instrument) to somebody.[46] According to McCauley and Lawson, religious rituals always involve *culturally postulated superhuman agents* (CPS agents). CPS agents are characterized by *counterintuitive* properties (see above). Furthermore, the basic character of the rituals is determined by the role that the CPS agents play in the action representation system (which includes agent, instrument and patient): If the CPS agent takes active initiative, then it is a *special agent* ritual. If the CPS

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[41]   Ibid., 74.

[42]   Ibid., 76.

[43]   Ibid., 49-59, 169.

[44]   Ibid., 8. Obviously, Whitehouse's attractor positions partly resemble Sperber's attraction model. Both share the commendable goal of establishing a link from micro-level cognitive phenomena to the level of more general social and cultural transmission—this is what the so-called "social mechanisms approach" also seeks to do. Whitehouse, however, goes further than Sperber by claiming a causal relation between particular "modalities of memory" and "social morphology." The main difference is that Sperber gives precedence to cognitively "effective" (i.e., cheap) modes of transmission while Whitehouse focuses on the cognitively costly part in the transmission. For the social mechanisms approach see Peter Hedström, *Dissecting the Social: On the Principles of Analytical Sociology* (Cambridge: Cambridge University Press, 2005).

[45]   Lawson and McCauley, *Rethinking Religion*, 77-79.
[46]   McCauley and Lawson, *Bringing Ritual to Mind*, 13-16.

agent is the object of worship, then we have a case of *special patient* ritual. In *special instrument* rituals, the CPS agent plays an instrumental role being neither the direct object or subject of ritual action.[47]

Agent	Act (by means of instrument))	Patient
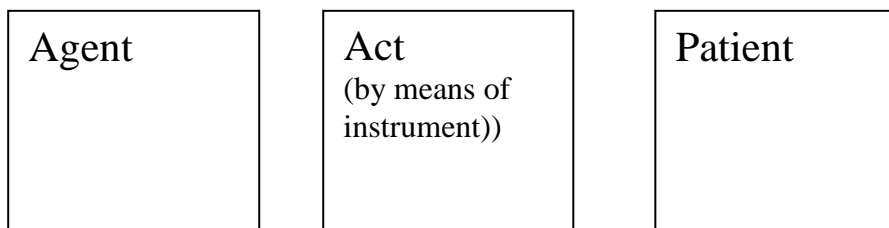
A notable feature in McCauley and Lawson's system is their technical definition of ritual. Rituals are only actions where an agent does something to a patient. This excludes from the category of religious rituals such religious actions as praying, singing, kneeling or chanting that may be parts of religious rituals but not independent rituals, in McCauley and Lawson's system.[48] In contrast to mere religious acts, rituals "bring about changes in the religious world."[49]

McCauley and Lawson claim that if religious rituals evolve, they will evolve either 1) in the direction of repeated rituals that involve low amounts of sensory pageantry and, consequently, low levels of emotional arousal, or 2) in the direction of non-repeated rituals that involve higher levels of sensory stimulation and emotional arousal. The direction of development depends on the role of the CPS agents. Special agent rituals evolve toward high levels of emotional arousal and low frequency. The intrinsic logic is that when superhuman agents act, then the effects are also super permanent and emotionally more significant because of the rarity of such rituals. In contrast, special patient and special instrument rituals evolve towards low emotional arousal and high frequency because the actors are human.[50]

The scope of Harvey Whitehouse's modes of religiosity is, in the words of Robert McCauley and Thomas Lawson, "enormous" and over the years he has made several concessions and modifications in the theory so that "In a particular religious system, nothing about alternation between the two modes over time is inconsistent with anything Whitehouse says." As often is the case with theories of this magnitude, Whitehouse's theory also seems to fall short as an overall description of religiosity. It is difficult to apply it directly in research on early Christianity but it may provide a useful starting point for further development of new approaches to early Christian rituals, if treated as a middle-range theory.

McCauley and Lawson's theory focuses more strictly on ritual. However, its definition of ritual is much narrower than the concept that is generally—more or less intuitively—used in research. Thus, the same that applies to Whitehouse's, also applies to McCauley and Lawson's theory: for biblical scholars, it provides a fresh approach for one aspect of ritual behavior, the ritual action, but it hardly counts as an exhaustive explanation of rituals in early Christianity.

7. The Social identity approach and cognitive science
In this section, my aim is to show how cognitive science can be used to support and deepen other methodological approaches—provided these have a reasonable cognitive interface. My example,

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[47]   Ibid., 23-30. The roles affect key qualities of the rituals, such as their repeatability, reversibility and substitutability. Ibid., 30-31.

[48]   Ibid., 13.

[49]   Ibid., 14.

[50]   Ibid., 42-44.

the so-called "social identity approach" comes from the area of social psychology. In what follows, I first introduce the cognitive roots of the approach (the interface) and the two key concepts, prototypes and exemplars that have been central when this approach had been applied in biblical studies. However, the application of these concepts in the analysis of biblical narratives raises some methodological problems which I address from two perspectives: first, by clarifying the concepts of prototypes and exemplars with the help of neuroscientific research and then showing how these concepts can be used in the study of social identity in the narrative of the Gospel of Matthew.

The interface

The term social-identity approach is an umbrella term which nowadays refers to Henri Tajfel and John Turner's social identity theory that was mainly developed in the 1970s, to Turner's self-categorization theory developed in the middle of the 1980s, and to later adaptations of these theories. Social identity theory and self-categorization theory are closely related; self-categorization theory, however, focuses more on the cognitive processes through which persons come to see and feel themselves as members of a group, as well as on the question of how membership in the group influences an individual's behavior.[51] Although self-categorization theory today is usually connected with the name of John Turner, the theory itself draws on the research on perception and cognition that Tajfel conducted at the beginning of his scholarly career.

At the beginning of the 1960s, Tajfel and Wilkes found that when subjects were judging the length of individual lines on a continuum, where the "short" end of the continuum was labeled "A" and the long end "B," they significantly exaggerated the difference between the A-type and B-type of lines. Furthermore, they tended to overestimate the similarity of the lines within the categories of A and B. Thus, all the A-lines were perceived to be more similar than they actually were; their difference in relation to the B-type of lines was also exaggerated.[52] Further experiments have shown that the same processes of categorization and accentuation also effect the estimation of social stimuli, that is, other people and other groups. It is easy to see the relation of these basic cognitive processes to phenomena that play a central role in intergroup relations: prejudice, ingroup biases and social stereotypes.

Prototypes and exemplars in the analysis of historical texts

Philip Esler has pioneered the use of the social identity approach in the study of New Testament.[53] Among the key concepts he adopted from the social identity approach in his study on Paul's letter to the Romans were *prototypes* and *exemplars*. In Esler's perspective, Paul used Abraham as a prototype who serves as the foundation for a new common ingroup identity for both Judean[54] and non-Judean Christians in Rome.

The concept of prototypes, or better "prototypicality," was introduced into the discussion of social perception by John Turner and his colleagues. They took their cue from Eleanor Rosch who had studied the cognitive representation of semantic categories in a series of experiments in the 1970s. The results of Rosch's experiments challenged the classic Aristotelian view according to which membership in a category is defined by a set of critical features shared by all members

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[51]   Dominic Abrams and Craig McGarty, "Self-categorization and Social Identity," in *Social Identity Approach: Constructive and Critical Advances* (eds. Dominic Abrams and Michael A. Hogg; New York: Harverster Wheatsheaf, 1990), 11-27, 11.

[52]   See Michael A. Hogg and Dominic Abrams, *Social Identifications: A Social Psychology of Intergroup Relations and Group Processes* (London: Routledge, 1988), 19-20.

[53]   Philip F. Esler, *Galatians* (London: Routledge, 1998); Philip F. Esler, *Conflict and Identity in Romans: The Social Setting of Paul's Letter* (Minneapolis: Fortress, 2003).

[54]   Esler prefers to use the term "Judean" instead of "Jewish" because, for him, it better captures the original geographical overtones of the Greek term. See Esler, *Conflict*, 63-74.

of the category. The experiments instead showed that, in practice, membership in a category is judged on the basis of a degree of similarity to the *prototype* (the best example) of the category in question. Consequently, members of a category vary in their degree of typicality.[55] In the sphere of the social identity approach, this means that group prototypes crystallize the idea of what it is to be a member of a group, thus creating the basis for social identity.

Because social-psychological research usually concerns present social groups and their relations, it is not clear from the outset how concepts and models developed within the social identity approach should be applied in the study of history and especially in the study of texts that are some two thousand years old. Because their discipline is oriented towards analyzing the contemporary social interaction, social identity theorists have not much reflected on temporal aspects of social identity phenomena. Esler provides a fine summary and discussion of the few social identity studies where this point of view is discussed.[56]

Esler's own research aims at illuminating the role of Abraham in Romans and it shows how important it is to integrate the SIA with a temporal historical point of view if it is to be applied in New Testament studies. Early Christian writers continuously reflect on their identities in relation to the past and to the future. They also employ characters from the Hebrew Bible, such as Abraham, in order to legitimize their own position. This kind of enlarging of the social identity approach brings in questions that have been dealt with in research on social and cultural memory. Although the inclusion of a temporal aspect complicates the social identity analysis to some extent, it is essential.

The role of exemplars and prototypes in social categorizations are usually studied in experiments where people are faced with on-line categorization tasks. Thus, they do not provide direct information of what role historical persons or culturally transmitted idealized heroes from the past play in social categorizations. Should these persons from the past be defined as exemplars? Or are they more like prototypes if their characterization is highly idealized? When Esler discusses the role of historical figures in creating a common ingroup identity, he refers to Churchill as an exemplar of Britishness and Charles de Gaulle as an exemplar of the French. On the other hand, Esler counts Abraham as a prototype. According to Esler,

> where a person belongs to the probably legendary past of a people, say Abraham or Roland, although the group members who accept his or her real existence will regard the person as (what I am calling) an exemplar, an outside observer would employ the concept of prototype.[57]

The problematic relation between exemplars and prototypes does not characterize only attempts

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[55]   Penelope Oakes, et al., "The Role of Prototypicality in Group Influence and Cohesion: Contextual Variation in the Graded Structure of Social Categories," in *Social Identity: International Perspectives* (ed. Stephen Worchel et al.; London: Sage Publications, 1998), 75-92, 75-76. Eleanor Rosch, "Cognitive Representations of Semantic Categories," *Journal of Experimental Psychology* 104, (1975): 192-233, esp. 193-196, 203-205, 224-227.

[56]   Esler, *Conflict*, 172-178.

[57]   Ibid., 173. Esler makes here an interesting distinction between emic and etic points of view, according to which, in the case of Abraham, an outside observer would employ the concept of prototype while the observer him/herself would think in terms of exemplar. This distinction, I think, hits right on the target of the problem that we are faced with when we are trying to analyze the historical record or fiction from an outsider's point of view. From the viewpoint of the perceiver, who is in the middle of a social categorization process him/herself, it is impossible to make such a conscious decision between exemplars and prototypes. For the brain, all the perceived objects are treated as exemplars on the basis of which the brain intuitively calculates on the nature of the prototypes. Only an outside observer can start thinking whether certain cultural products are influenced by the prototypes a mind has created to such extent that it would be reasonable to call them "prototypes" as distinct from "rank and file" exemplars.

to apply the social identity approach to history. Social psychologists have also debated on the issue, trying to define whether classification is driven by exemplars or prototypes.[58]

Prototypes and exemplars in the light of neuroscience
In another context, I have clarified the distinction between prototypes and exemplars with the help of brain research but in the present context, it is not possible to go into details of this discussion.[59] In short, my consulting of brain research on the problem of how brain deals with concrete cases (examples) and their schematic, more abstract equivalents (prototypes formed on the basis of examples that resemble each other) showed that there are two different systems in our brain for processing exemplars on the one hand and prototypes on the other hand. A cognitive module on the right side of our brain collects and restores exemplars while another module on the left side of our brain is specialized in abstracting prototypes from the observed exemplars. Thus, in the light of the laterality experiments, the left hemisphere appears as an interpreter that goes beyond simply observing the facts by creating theories that assimilate the observations in comprehensive wholes. In the right hemisphere, the observational accuracy remains high because it is not engaged in these kinds of interpretative operations. In an intact brain, these two systems operate in concert, allowing highly developed category formation and theorizing without sacrificing veracity.[60]

These results are significant for our discussion in three respects: First, brain research seems to solve the dispute among social psychologists, by showing that it is not either prototypes or exemplars but both.

Second, the fact that exemplars and prototypes are rooted in brain functions gives further credence to their application in social identity research.

Third, because of these results it might be useful—especially for historical analyses of identity construction—to make a distinction between cognitive prototypes and cultural prototypes. In this distinction cognitive prototypes refer to the mental processes studied in cognitive and social-psychological research. Cultural prototypes, for their part, refer to cultural representations of either historical or fictive persons for the purposes of creation and maintenance of social identities.[61] Although, from the cognitive point of view, ingroup members process these cultural

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[58]   Cf. Eliot R. Smith and Michael A. Zárate, "Exemplar Based Model of Social Judgment," *Psychological Review* 99, (1992): 3-21; Brian Mullen, et al., "The Phenomenology of Being in a Group: Complexity Approaches to Operationalizing Cognitive Representations," in *What's Social About Social Cognition? Research on Socially Shared Cognition in Small Groups* (eds. Judith L. Nye and Aaron M. Brower; London: Sage Publications, 1996), 205-229.

[59]   Luomanen, "The Sociology of Knowledge," 199-229, 217-220.

[60]   Although the left hemisphere is better at category formation and interpretation, the right hemisphere is faster and more accurate in tasks demanding identification of previously confronted stimuli. When split-brain patients were asked whether or not they had seen a series of stimuli in the set that they had studied for the experiment, their right hemisphere was able to correctly identify the previously seen items and reject the ones that were not seen. However, the left hemisphere of these patients tended to falsely identify items that were not seen in reality but which resembled those that the subjects were shown, presumably because the left hemisphere found these correct in the light of the schema/prototype it had created. Michael S. Gazzaniga, et al., *Cognitive Neuroscience: The Biology of the Mind* (New York: W.W. Norton & Company, 2002), 436-447, 672-675.

[61]   I suggested earlier that the word "prototype" could be reserved solely for the cognitive abstractions that are created in the mind. See Luomanen, "The Sociology of Knowledge," 199-229, 210-224. However, this may not be reasonable given the present use of the word in social memory discussion. Moreover, the term "cultural prototype" does better justice to formation of precipitates in social discourse, a process that can be conceived as analogous to how cognitive schemata (i.e., cognitive prototypes) are abstracted in the brain. However, cultural prototypes have an elementary connection to exemplars since in on-line categorization, these cultural prototypes function as salient exemplars that—together with other exemplars available for the ingroup members in their social context—result in context dependant calculations of cognitive prototypes.

prototypes basically the same way as exemplars, they are created and characterized the way they are because they typify characteristics that are of primary importance for the creation of positive ingroup identity. Thus, they appear as precipitates of culturally transmitted ideals of what it is to be an ingroup member. As such, they reflect the cognitive prototypes of the cultural entrepreneurs who have presented them and they play a key role in shared social memories. However, from the social identity perspective, these cultural prototypes, important as they are, are never to be identified with the cognitive prototypes that individuals calculate on the basis of all relevant concrete exemplars and cultural prototypes.

In this regard, it does not make any difference whether the person in question is historical or not—except in the sense that fictive persons may more directly reflect the cognitive prototypes of cultural entrepreneurs. In cultural identity-building discourse, both fictive and historical persons are prone to similar processes of typification and accentuation of traits that are important for the creation of common ingroup identity. Consequently, in this perspective, Abraham in Romans should be categorized as a cultural prototype because it is clear that his person has become detached from real history and mainly serves the needs of identity construction.

8. Social identity approach to Matthew's community of Christ followers: methodological considerations

Although Esler provides a reasonable theoretical discussion of how the SIA can be applied in Paul's letters, it is not directly applicable to the study of early Christian gospels. In the case of Paul's genuine letters, we are dealing—from the social identity perspective—with a relatively reliable historical record of how Paul, as a social entrepreneur, propagated his understanding of Christian identity to the recipients of his letters. However, when compared to Paul's (genuine) letters, the relationship between history and the text is much more complicated in the gospels.[62] Gospels are multilayered historical records that tell the story of Jesus. It is only through this story that we can—by means of historical-critical study—try to reconstruct historical situations that accompany the gospels' cumulative editorial history.

Although the application of the SIA to a historical and partly fictive record presents problems that have to be solved, it is easy to defend the basic applicability of the approach in the study of historical phenomena: The SIA is rooted in cognitive psychology and human cognition has remained practically the same for many thousands of years. Therefore, it is to be expected that the cognitive processes steering group categorizations and the formation of ingroup biases were basically the same at the time when Matthew composed his gospel as they are now. Thus, the two thousand year time gap between us and Matthew does not as such present any problem for the applicability of the SIA. The problem is only how to get valid information about the historical situation(s) through a multilayered gospel narrative. The crucial question is: Does Matthew's story about Jesus provide reasonable information and enough information for the application of the SIA?

In my view, it does. Even more, Matthew's narrative of Jesus seems to provide a particularly interesting and fruitful starting point for the application of the SIA because of its transparent character. When redaction critics have compared Matthew's description of Jesus' followers and his opponents with Q, Mark and Luke, it has become clear that the characters in Matthew's narrative have gone through an extensive typification.

This typification involves standard labels and patterns of behavior that Matthew uses in his characterization of Jesus' opponents on the one hand, and his followers on the other hand. The standard title for Jesus' opponents in Matthew's narrative is "the scribes and the Pharisees."

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[62] The social identity approach has already demonstrated some of its potential in the study of Matthew's gospel. For a perceptive analysis of Matthew 23, see Raimo Hakola, "Social Identity and a Stereotype in the Making: The Pharisees as Hypocrites in Matt 23," in *Identity Formation in the New Testament* (eds. Bengt Holmberg and Mikael Winninge; vol. 227 of *Wissenschaftliche Untersuchungen zum Neuen Testament* Tübingen: Mohr Siebeck, 2008), 121-139. Hakola, however, does not deal with the methodological issues in detail.

Throughout the narrative, these appear as "hypocrites" who plot against Jesus and ask him nasty questions. Matthew has also made Jesus give an authoritative speech against them in Matthew 23. On the other hand, genuine followers of Jesus in the narrative are described as persons who come to him, fall on their knees and address him as Kyrios.[63] Furthermore, Peter is presented as the spokesperson for the closest disciples. Ulrich Luz has characterized these features of Matthew's narrative with the term *transparency:* disciples in Matthew's narrative are transparent characters through which Matthew addresses his own post-Easter community.[64]

From the perspective of the SIA, this phenomenon can be characterized in terms of exemplars and prototypes. As noted above, an exemplar refers to an actual representative of a group while a prototype is formed on the basis of actual examples and it is defined as a summary or ideal representation of group members. A prototype embodies the positive characteristics that a perceiver finds as most typical of the members of a group. When applied to Matthew's gospel, these definitions and the considerations above, lead us to characterize Matthew's highly typified descriptions, for instance, of the scribes and Pharisees, disciples and Peter as *cultural prototypes* that reflect the cognitive prototypes of ideal group members in the mind of the editor of the gospel.

Although I think that the above-suggested distinction between cognitive and cultural prototypes will be helpful in future analyses of Matthew using the social identity approach, it is more important to take note of the general compatibility of the social identity approach with earlier redaction-critical analyses. The social-scientific approach is often accused of reading the evidence in the light of the chosen models or imposing on the text models and categories that are foreign to it. Obviously, such imperialism of modeling is less likely to occur if we apply the concepts of exemplars and prototypes in our analysis of Matthew.

9. Conclusion

In the present article, I have focused on casting light on some key disciplines and methodological issues related to the application of cognitive science in biblical studies. A complete picture of areas where cognitive science has already been applied in biblical studies would require a much longer discussion. For instance, this article has not dealt with the research on memory in neuroscience and cognitive psychology that is important for the research on social memory, currently flourishing within biblical studies. Nor have I touched upon cognitive approaches to social networking, a topic that is quite essential if we are to understand the spread of early Christianity during its first centuries. As regards networking, there are several relevant areas in cognitive science and the CSR that have already also been explored by scholars of early Christianity: computer modeling of networks, the so-called "costly signaling" theory in ritual studies and game theory.[65] Other relevant themes would also include the research on altered states of conscious-

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[63]   The address *Kyrios* is typical of Matthew. It appears in Matt 24, Mark 1 and Luke 18. Of Matthew's 24 occurrences, 11 are clearly redactional, 4 come from Q, and 1 from Mark. Four occurrences are in the Q-tradition and 4 in Matthew's special tradition. *Kyrie* appears in the mouth of disciples and other applicants while the outsiders address him as *didaskalos*. The phrases describing how people come to Jesus and fall on their knees in front of him are also typical of Matthew. For details, see Appendix 2 in Petri Luomanen, *Entering the Kingdom of Heaven: A Study on the Structure of Matthew's View of Salvation* (Tübingen: Mohr Siebeck, 1998).

[64]   For Luz's concept of transparency, see Ulrich Luz, "The Disciples in the Gospel According to Matthew" in Ulrich Luz, *Studies in Matthew* (Grand Rapids., Mich.: Eerdmans, 2005), 115-142, and Luomanen, *Entering*, 19-20.

[65]   A useful introduction to computer modeling of religious networking is William Sims Bainbridge, *God from the Machine: Artificial Intelligence Models of Religious Cognition* (Lanham: Altamira Press, 2006). Recent volumes on social memory in early Christian studies include, for instance, Alan Kirk and Tom Thatcher, eds. *Memory, Tradition, and Text: Uses of the Past in Early Christianity* (Semeia Studies 52; Atlanta, GA: Society of Biblical Literature, 2005) and Werner H. Kelber and Samuel Byrskog, eds. *Jesus in Memory: Traditions in Oral and Scribal Perspectives* (Waco: Baylor University Press, 2009). A useful volume with a broader cul-

ness, the role of emotions in moral reasoning, cultural evolution, etc.[66]

Although the selection of approaches in this overview has been restricted, I hope I have succeeded in demonstrating the different ways through which cognitive science can enrich early Christian studies. Overall, the cognitive approach can contribute to the study of Christian origins especially by providing scientifically tested information and systematically formulated theories about the functions of the mind. Quite often, scholars supplement their historical constructions with psychological assumptions about "reasonable" or "natural" human responses and strategies. Instead of doing these reconstructions instinctively, on the basis of gut feelings alone, it would be better if we can use some systematically formulated and tested theories. As we have seen, it is already possible to validate some cognitive and social psychological conceptualizations with neuroscientific experiments. In the future, there will probably be even more opportunities for this.

It is equally important also to try to link the cognitive analysis with the concrete social setting and culture where the individual cognition is embedded. If the CSR focuses only on the individual minds and tries to explain large scale cultural transmission (epidemiologies) solely on the basis of the innate propensities of cognition, it falls prey to the same kind of ideological fallacy of which one-sided redaction criticism is often accused. Ideas do not jump from mind to mind like viruses in the air (or like memes). They travel through social networks and various cultural medias which all make them susceptible to mutation and dependant on what the receiver of the tradition finds relevant in his/her situation.

The (hypo)theses that I have developed in this overview concerning the applicability of cognitive science in biblical studies can be summarized as follows:

- Cognitive science is not a new "method" for textual analysis, comparable to, for instance, narrative criticism or historical-critical analysis. It is a multidisciplinary field with possible connections to several methods already applied in biblical studies.
- Cognitive science gives us necessary background information about the generalities of human cognition which, in its past social context, produced the texts we are studying.
- Cognitive science (or the CSR) is not an alternative to historical-critical or literary critical analysis of the texts. It presumes them, may support them, and provides theories to be tested.

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tural perspective on social memory is Pascal Boyer and James V. Wertsch, eds. *Memory in Mind and Culture* (Cambridge: Cambridge University Press, 2009). Petri Luomanen, "How Religions Remember: Memory Theories in Biblical Studies and the Cognitive Study of Religion," in *Mind, Morality and Magic: Cognitive Science Approaches in Biblical Studies* (eds. Risto Uro and István Czachesz: Equinox, forthcoming) analyzes the relation of the CSR to the memory discussion within biblical studies. For costly signaling, see Joseph Bulbulia, "Meme Infection or Religious Niche Construction? An Adaptationist Alternative to The Cultural Maladaptationist Hypothesis," *Method & Theory in the Study of Religion* 20, no. 1 (2008): 67-107. Risto Uro, "Kognitive Ritualtheorien: Neue Modelle für die Analyse urchristlicher Sakramente," *Evangelische Theologie* 71, no. 4 (2011): 272-288 provides a helpful overview of cognitive ritual theories, including the costly signaling perspective. Game theory, which is a standard topic in economics and philosophy is, of course, also related to computer modeling. For an interesting round of tests, see Bainbridge, *God from the Machine*, 97-116.

[66]   Cf. Colleen Shantz, *Paul in Ecstasy: The Neurobiology of the Apostle's Life and Thought* (Cambridge: Cambridge University Press, 2009) for altered states of consciousness and Thomas Kazen, "Moralische Emotionen in der Jesusüberlieferung. Ein psycho-biologischer Beitrag zum Verhältnis von Selbstverhaltung und Nächstenorientierung," *Evangelische Theologie* 71, no. 4 (2011): 288-306, for emotions. Although I have some reservations regarding the usefulness of evolutionary psychology in the analysis of cognitive phenomena, I find the wider evolutionary perspective on the rise of Christianity quite interesting and promising. A groundbreaking but largely unknown contribution in this area is Gerd Theissen, *Biblical Faith: An Evolutionary Approach* (Minneapolis, MN: Fortress Press, 2007 (=1984)). David Sloan Wilson, *Darwin's Cathedral: Evolution, Religion and the Nature of Society* (Chicago: The University of Chicago Press, 2002), is relatively well known among CSR scholars and evolutionary theorists. Wilson should be credited for his multidisciplinary interest although his knowledge of research on early Christianity quite limited.

- The primary objects of biblical and related studies are cultural products, ancient text. As cultural products, they are deeply rooted in their original social contexts, and their interpretation is rooted in the interpreters' social context. Therefore, a multidimensional socio-cognitive analysis is a recommended approach to early Christianity if one wishes to make use of the full potential of the rapidly developing cognitive science.