

Cognitive Science of Religion and the Study of Theological Concepts

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Abstract The cultural transmission of theological concepts remains an underexplored topic in the cognitive science of religion (CSR). In this paper, I examine whether approaches from CSR, especially the study of content biases in the transmission of beliefs, can help explain the cultural success of some theological concepts. This approach reveals that there is more continuity between theological beliefs and ordinary religious beliefs than CSR authors have hitherto recognized: the cultural transmission of theological concepts is influenced by content biases that also underlie the reception of ordinary religious concepts.

Keywords Cognitive science of religion · Evolutionary approaches to culture · Content biases · Theology

1 Introduction: CSR and Theology

Religious beliefs are cross-culturally ubiquitous. According to the cognitive science of religion (CSR), their transmission is guided and constrained by the structure of our minds; they are “cognitively natural” (McCauley 2011). Examples of cognitively natural religious beliefs include belief in an afterlife, souls, supernatural agents, and miraculous events. Such beliefs emerge relatively easily, with little instruction, and are well-established around

middle childhood. They are cross-culturally widespread, and do not require extensive cultural support, such as written texts, for their transmission (Rottman and Kelemen 2012). Over the past two decades, CSR has made tremendous progress in understanding the cognitive basis of cognitively natural beliefs and practices.

By contrast, the acquisition and transmission of theological beliefs remains a relatively underexplored topic in CSR. Some authors have explicitly argued that the approaches used in CSR are of little explanatory value for theology. McCauley (2011) outlines a spectrum of beliefs and practices that range from maturationally natural to unnatural. The latter, unlike the former, require formal schooling, effort and specialization, and are usually culture-specific. He places ordinary religion at the natural end of the spectrum, and theology at the unnatural end, together with science. Barrett (2011, 139) concurs, “While general religious thought and action have largely natural cognitive foundations, theology typically does not have anything like the same naturalness.”

This cognitive division between theology and folk religion can be traced back to Hume (1757), who proposed that there are two kinds of questions about religion: that “concerning its foundation in reason” (theology), and that concerning its origin in human nature, which he termed “the natural history of religion.” The natural history of religion was the eighteenth-century precursor to CSR; it examined the variety of religious beliefs across cultures and speculated about their underlying causes, including their psychological origins. Hume proposed that the natural history of religion undermined the rationality of folk religious beliefs: they are acquired through various unreflective cognitive biases, like wishful thinking, none of which reliably leads to the acquisition of true beliefs. On the other hand, Hume proposed that sophisticated theological views

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escaped this debunking, as they (unlike folk religious beliefs) were the result of careful reflection and reasoning. Still, in his posthumously published *Dialogues concerning natural religion* (1779), Hume thought that this separation could not be strictly maintained: he argued that the argument from design for the existence of God is informed by a spontaneous analogy that humans draw between created artifacts and the natural world; this analogy was unwarranted, and therefore, the design argument was unsound. Interestingly, Hume's insight is confirmed in recent empirical work on the human natural tendency to discern goal-directedness and design in nature (Kelemen 2004). This research indicates that the argument from design appeals to our intuitive, evolved understanding of natural objects, and thus indicates continuity between natural theological reflection and untutored intuitions (De Cruz and De Smedt 2010).

The current literature on theology and CSR employs two related concepts: *theological correctness* and *theological incorrectness* (e.g., Boyer 2002, 283; Barrett 2011, 138; Slone 2004). Theologically correct beliefs are beliefs that people reflectively and explicitly hold in line with the accepted theology of their religious tradition. When caught off-guard, these are replaced by more intuitive, but less theologically correct beliefs. Theological incorrectness occurs when religious believers unwittingly distort the official doctrines of their belief systems to fit their intuitive expectations. For example, the culturally ubiquitous belief in luck is incompatible with many theological systems e.g., the Buddhist doctrine of karma, but most Buddhists nevertheless hold a continued folk belief in luck (Slone 2004, chapter 6).

Barrett and Keil (1996) demonstrated that theologically correct beliefs get distorted in online reasoning tasks, when believers have to infer what God would do or know in concrete situations. They first asked Christian participants a series of questions that probed their understanding of divine properties, e.g., whether or not God could attend to more than one event at the same time. The subjects answered theologically correctly: God can do so because he is omniscient. However, when they were asked to recall stories about God, they unwittingly distorted them to fit God's behaviors and thoughts to intuitive expectations they had about normal people, e.g., they were likely to misremember the stories to the effect that God could only have attended to one event at a time. Such instances of theological incorrectness constitute what Boyer (2002, 285) has termed "the tragedy of the theologian": in spite of the considerable effort of theologians to propagate coherent religious worldviews, these will get to some extent distorted by the lay audience.

While cognitive differences between theology and ordinary religious beliefs are relevant, the influence of

cognitive biases on theology is not limited to theological incorrectness. In this paper, I will examine whether approaches from CSR, especially the study of content biases in the transmission of beliefs, can help explain the cultural success of some theological concepts. I will argue that the cultural transmission and acceptance of official theological doctrine is influenced by content biases that also underlie our reception of ordinary religious beliefs. Thus, content biases not only give rise to theological incorrectness, but also play a guiding role in the cultural evolution of official theological doctrine. This approach reveals that there is more continuity between theological concepts and ordinary religious beliefs than CSR authors have hitherto recognized.

2 Theological Concepts as Reflective Religious Beliefs

CSR examines how the structure of our minds influences the emergence and continued cultural success of cross-culturally ubiquitous religious beliefs, such as belief in supernatural beings like spirits and gods, and belief in a continued existence after death. Although innate human cognitive dispositions render our minds receptive to religion, they do not, by themselves, provide the rich content of fully-fledged, culture-specific religious beliefs and practices that we see the world over. No child has spontaneously and independently come up with anything approaching the complexity of beliefs and rituals practiced in, say, Hinduism or Islam. To put the point vividly, Banerjee and Bloom (2012) contend that Tarzan would not believe in God, because he would not have been exposed to the relevant theistic beliefs.

It is useful here to draw a distinction between *intuitive* and *reflective* religious beliefs (see e.g., Sperber 1997, for a discussion of this distinction). Intuitive religious beliefs are spontaneously generated by our cognitive system. They do not require cultural input. Although they can be culturally transmitted, their transmission rarely involves teaching or training. An example is the intuitive belief that a given significant event in one's life has some higher purpose, it is "meant to be." Remarkably, even people who explicitly deny any role of fate or supernatural influence in their lives tend to interpret events in this way, e.g., when asked why he failed an important course, an atheist replied, "So that I could see that even if I failed a course, my life wouldn't actually end" (Heywood and Bering, in press). Intuitive religious beliefs can lie at the basis of reflective, culturally elaborate religious concepts. Unlike intuitive beliefs, they are explicitly held, often stored in a linguistic format, and their transmission requires deliberate teaching. For example, the underlying cause of significant life events is specified in various cultures as karma, divine immanent

justice, or providence. Such reflective beliefs are not spontaneous deliverances of our cognitive faculties. Theological concepts, such as the Trinity in Christianity or Brahman in Hinduism, clearly belong to the category of reflective religious concepts.

Much research in CSR has focused on *content biases* as a way to understand both intuitive and reflective religious beliefs. Content biases are biases involved in the generation and transmission of beliefs. They direct our attention to the content of representations, such as their fit with our earlier beliefs, ease of comprehension or processing, and the degree to which they are remarkable or surprising. They can be domain-specific or domain-general. Recently, Gervais et al. (2011) have argued that the explanatory value of content biases remains limited for reflective religious beliefs. Gervais and Henrich (2010) take Zeus as a case in point: Zeus has many properties that make him an attractive candidate for religious belief (e.g., he is very powerful and plays a role in the moral lives of his devotees), but because the relevant social learning context is no longer available (e.g., the presence of other believers in Zeus, or of ritual displays that enhance his credibility), faith in Zeus has disappeared. By contrast, the Christian God has all these contextual factors at his disposal, accounting for his present high success. Gervais et al. (2011) claim that while content biases can explain why some religious beliefs are memorable and widespread, they cannot explain why humans commit to and have faith in highly culture-specific reflective religious ideas. Authors who follow this approach to culture (e.g., Henrich and Boyd 2002) tend to place more emphasis on *context biases*, i.e., biases not directed to the content of specific beliefs but to the context in which they are transmitted, such as the perceived reliability or prestige of the source. Context biases undeniably play a critical role in the propagation of theological concepts. In the next sections, I will argue that content biases are also vital to understand the cultural development and success of theological concepts.¹

3 Content Biases and their Application in CSR

Cognitive anthropologists (e.g., Boyer 2002; Claidière and Sperber 2007) have studied the role of content biases in cultural transmission. Unlike traditional anthropologists, their focus is not on the variation and diversity of cultures, but rather, on what makes some representations more stable and successful, both across and within cultures. This

stability is surprising when one considers that beliefs do not simply jump from brain to brain but involve a complex process of reconstruction within individual minds. Religious beliefs that are easier to remember are, all things being equal, better candidates for successful transmission than beliefs that are hard to recall. By the same token, religious concepts that do not fit our background beliefs, or are hard to remember are less likely to be adopted and spread. Human minds are predisposed to find some religious concepts more attractive and easier to transmit than others (e.g., gods with special mental and physical powers and a concern for morally relevant actions versus gods without any power, with a concern only for our taste in movies). I will now briefly review content biases that play a role in the transmission of religious beliefs.

3.1 Intuitive Ontologies

The best-studied content biases in CSR fall under the category of intuitive ontologies. Intuitive ontologies are a limited set of category-based evolved expectations that emerge early in development and that guide reasoning about physical, psychological and biological phenomena (e.g., De Cruz and De Smedt 2007). Ontology is the philosophical study of being, i.e., what kinds of entities there are in the world, and how they relate to each other. Category-based inference mechanisms are ontologies in the sense that they provide a set of expectations of how specific kinds of objects will behave. They are termed “intuitive” because they are not the product of deliberate reflection or scientific investigation. Examples of intuitive ontologies include intuitive physics (how inanimate objects move), intuitive psychology (how agents behave), intuitive biology (how living things develop and behave), and intuitive engineering (how artifacts are made and function).

Many CSR authors appeal to intuitive ontologies to understand stable, cross-cultural features of religious beliefs and practices. For example, Bloom (2004) argues that humans are intuitive dualists. They naturally believe that part of a person is non-material (the soul), and that this part can survive the physical death of the body. Bloom speculates that this is a result of our intuitive ontological distinction between minds and physical bodies: humans have different evolved inference systems for psychology and physics. When we have to explain an agent’s actions or speech acts, we attribute invisible mental states to them, such as beliefs and desires. Cross-culturally, around 4 years of age and probably earlier, young children understand that mental states are distinct from the physical world: agents can hold false beliefs that differ from the state of the world (Barrett et al. 2013). Moreover, we can continue to attribute mental states to a person even after their physical death (e.g., grandpa would never agree to this). This makes it natural for humans to suppose that mental states are

¹ For the sake of brevity and scope, I will leave aside the role of context biases in the transmission of theological concepts. I take it as uncontroversial that they are important for providing a full account of the cultural evolution of theological views.

distinct from the physical body, and that they can survive the physical death of a person. A striking illustration of this is the tendency of five-year-olds, even those raised in secular households, to believe that a dead mouse, eaten by an alligator, can continue to feel sad and miss its mother (Bering et al. 2005). Nevertheless, it turns out to be very hard to imagine a (deceased) person as entirely disembodied. Humans are weak intuitive dualists: they conceptualize people as composed of mind-stuff and body-stuff; these are ontologically distinct, but both figure in our conceptualization of personhood in the afterlife (Hodge 2011). As a result, afterlife beliefs that emphasize the continuity of a soul, while preserving some physical elements (e.g., the hereafter conceptualized as a lush pleasure garden) are cross-culturally pervasive (see Nähri 2008, for review). Such reflective religious concepts are culturally attractive because of their fit to our intuitive expectations.

Boyer (2002) has formulated an influential and generalized approach to religion based on intuitive ontologies. Religious concepts owe their cultural success to their minimal counterintuitiveness. They violate one or a few intuitive expectations, but adhere to most other assumptions. For example, miracle stories often involve physically impossible events, such as someone who turns water into wine, walks on water, or multiplies bread and fish to feed a multitude. According to Boyer, such stories and concepts enjoy a memory advantage because they are both attention grabbing (by their violation of intuitive expectations) but yet not too taxing to represent (by adhering to most of our other intuitive background knowledge). In this way, they achieve a cognitive optimum between ease of processing and strikingness. For instance, ghosts violate intuitive physics in their ability to walk through walls and to appear and disappear at will, but they conform to intuitive psychology in that they behave like other agents, with beliefs, desires, and emotions. The violation of intuitive physics makes them remarkable; their psychology is ordinary. This can explain the cross-cultural success of ghost concepts. Several studies (e.g., Barrett and Nyhof 2001) confirm that minimally counterintuitive concepts (e.g., crying chairs) are indeed more memorable than representations that entirely conform to our intuitive expectations (e.g., wooden chairs) or concepts that are highly counterintuitive (e.g., crying, invisible chairs that speak Hungarian).

3.2 Internal and External Coherence

Although intuitive ontologies have been central in CSR to explain the acquisition of religious beliefs, they are not the only content biases that govern the cultural transmission of religious beliefs. When humans decide whether or not to adopt a given religious view, they not only consider how remarkable or interesting it is, but also whether or not the

belief is plausible, given their background beliefs and other content-based information. An important cue for evaluating culturally transmitted information is coherence (see Mercier 2012, for review). *Internal coherence* refers to the internal consistency of communicated information. A speaker making claims that are internally incoherent, e.g., that have internal contradictions, raises a red flag: she is either mistaken or lying. We expect that a truthful report is coherent, and likewise, we aim for coherence in our own accounts in order to be more convincing and persuasive. Six-year-olds exhibit a preference for accounts that are internally coherent over incoherent accounts, and they attempt to provide internally coherent explanations, for instance, on the origin of species (e.g., Samarapungavan and Wiers 1997). From this, we can infer that successful religious claims tend to exhibit a greater degree of internal coherence than unsuccessful ones.

Listeners also evaluate the *external coherence* of information: their acceptance of new ideas is influenced by how well they cohere with beliefs they already hold. A striking form of this is confirmation bias (Nickerson 1998), a tendency to selectively attend to and evaluate evidence more positively when it is in line with one's prior beliefs. People also exhibit disconfirmation bias, i.e., they are more likely to dismiss evidence that disconfirms their own beliefs or that confirms beliefs that are incompatible with their own convictions. As a result, beliefs that match earlier-held convictions have a higher chance of being accepted whereas those that do not have a lower chance of transmission. For example, Legare and Gelman (2008) found high levels of endorsement for both natural and supernatural explanations for the AIDS epidemic in South Africa. Although adults and adolescents are keenly aware of the biological causes of AIDS, they frequently invoke witchcraft as an ultimate cause, treating the biological cause (viral infection) as a means by which witches achieve their goals ("A witch can put you in the way of viruses and germs"). The pervasive use of witchcraft as an explanation for misfortune in South Africa, combined with western knowledge about biological causes, can account for the high endorsement of both types of explanation for AIDS. External coherence can explain why South Africans think witchcraft is a plausible cause for AIDS—it is plausible because explanations invoking witchcraft are culturally salient, and likely to be part of their background beliefs, whereas westerners prefer exclusively biological causes to explain the same phenomenon (witchcraft is not culturally salient).

4 Content Biases and the Transmission of Theological Concepts

Theology can be broadly understood as the institutionalized and systematic reflection on religious beliefs and their

relation to other beliefs. Theologians examine, amongst others, authoritative texts as a source of religious truths (revealed theology), reason, science and the natural world as sources of religious knowledge (natural theology), religious beliefs endorsed by ecclesiastic authorities (dogmatic theology), and the interrelations between religious beliefs (systematic theology). Theological concerns and solutions are highly susceptible to change over time, and show considerable variation across denominations and religions. Ordinary religious concepts involve a rich array of practices, such as prayer, performing rituals, dressing appropriately, and observing food taboos. Theology, by contrast, is relatively sparse in its practice: it primarily involves reading, writing and reflection, and is only performed by specialists, such as monks and scholars. Whereas folk religious beliefs are acquired without substantial formal instruction, theology requires years of training, study, and deliberate practice. As a result, theological views are less culturally pervasive than ordinary religious beliefs; they are mainly restricted to large-scale societies.

In spite of this rarity, theological beliefs and modes of reasoning do show some remarkable cross-cultural patterns. For instance, the argument from design for the existence of God/the gods has been formulated independently in several traditions, including Hinduism, ancient Greek philosophy, Islam and Christianity. Speculations on whether humans have free will are not only present in the Abrahamic monotheistic traditions, but also in other religious traditions that have gods with unlimited power and knowledge, such as the Kapauku from Papua New Guinea or the Yoruba (Pospisil 1978). Such cross-cultural patterns (which have not been systematically investigated) could shed light on the role of content biases, like the role of intuitive teleology in the formulation of the design argument.

Nevertheless, many theological concepts are culture-specific, and strike even experts as arcane and hard to grasp. Theologians continue to be puzzled by the seeming incompatibility of the claims that God has one substance, is three persons, but is nevertheless simple and undivided. Context biases can play an important role in explaining why adherents to a religious tradition assent to its theological statements, such as those expressed in the Nicene Creed. This Creed, like other statements of faith, propagates a highly counterintuitive concept of God. God is both three persons and of one substance, is eternal, yet born of a virgin and mortal; the relationship between the three persons of the Trinity is asymmetric (the Spirits proceeds from the Father and the Son). Such a puzzling jumble of features far exceeds the minimal counterintuitiveness that makes ordinary religious beliefs memorable. The repetition of the Nicene Creed during religious services, however, helps to heighten its familiarity and increases its salience. This practice also stresses that people in authority, such as priests and bishops,

endorse the Nicene Creed and it highlights the perceived consent in the community about its truth. These contextual factors can help explain why ordinary religious believers endorse the Creed, even though most do not understand its underlying theological motivations, or would otherwise find it hard to remember. Orthodoxy in western, pre-Reformation Christianity was what the majority of bishops taught in a given time and to be catholic was to concur with the majority (Edwards 2009).

However, Edwards (2009, 7) notes that this appeal to context biases does not provide a full historical account of orthodoxy, since this would be “to forget the provisional character of the norm [that later turned out to be orthodox] in each generation.” What was a heresy in one generation could become orthodoxy in the next, for instance, the one substance doctrine of the Trinity, *homoousios*, was dismissed as heresy in 268, but became the bedrock of the orthodox concept of the Trinity only 60 years later. The reverse has also occurred: the dual nature model of Christ (i.e., that Christ is both divine and human) was rejected in seventh-century Byzantium, and its proponents were vigorously prosecuted. Maximus Confessor’s right hand and tongue were cut off so that he could no longer preach or write against the then accepted one-nature doctrine of Christ. Less than 30 years later, the emperor and bishops decided that Christ had two natures after all (the Sixth Ecumenical Council 680–681), and Maximus was vindicated (Jenkins 2010, 53). What factors decided the fate of theological concepts? Why did some achieve the status of official doctrine, whereas others became heresy? As we will see in the next sections, such changes were often influenced by content biases.

4.1 Intuitive Ontologies

In his study of norms relating to disgust, Nichols (2002) shows that cultural diversity and change over time are not incompatible with a prominent role of content biases. Clearly, proper table manners vary substantially in space and time. Yet, Nichols found that table manners, described in Erasmus’ *On Good Manners for Boys* (early sixteenth century) that are in accordance with a human evolved sense of disgust for bodily fluids and functions (e.g., do not blow your nose in the tablecloth) had, over time, a higher likelihood to be part of contemporary American etiquette than those that were neutral with respect to our sense of disgust (e.g., keep both hands on the table). We can likewise look for correlations between intuitive ontologies and the cultural success of theological concepts over time. As an example, I will now briefly consider the cultural evolution of theological views about the afterlife in Christianity.

In the New Testament (Acts, several Pauline epistles and Revelation), Christians already expressed belief in the

general resurrection, the view that at the end of times, the dead will be raised and everyone will be brought to final judgment. Interestingly, the earliest Christian traditions on the general resurrection are in keeping with a strong physicalist concept of personhood. Physicalism conceptualizes people exclusively in terms of their physical bodies, not in terms of an immortal soul. In this physicalist view, resurrection means a resurrection of the flesh only, and no reference is made to the soul. However, there is a problem with this view. Already in Paul's first letter to the Corinthians (15:35), skeptics question the physical resurrection of the dead: "How are the dead raised? With what kind of body will they come?" This is the problem of personal identity: physical bodies decay (rot, burn, etc.) and get ultimately destroyed after death. It is not at all obvious how they could be reconstituted at the Day of Judgment. Indeed, when children and adults across cultures are presented with narratives or cues that highlight biological aspects of death (such as a doctor's unsuccessful attempts to rescue a dying person on the operating table), they are more likely to assert that living functions, and particularly bodily functions, have ceased. By contrast, when prompted by a spiritual, religious narrative, respondents are more likely to assert that mental, but not physical, functions of the deceased continue (e.g., Astuti and Harris 2008). The doctrine of the physical resurrection, which asserts a postmortem continuation of bodily functions, is hard to conceptualize. A major obstacle was the problem of chain consumption: suppose an animal devours and digests a human, and the animal is subsequently eaten by another human. With a resurrection of the flesh, how will the bodies of both individuals be reconstituted, given that the first body has become part of the second? Worries like these may explain why the resurrection of the flesh became a hotly contested part of Christian theology. As Augustine [fifth century (1886), 437] observed "There is no article of the Christian faith which has encountered such contradiction as that of the resurrection of the flesh."

Early patristic theologians like Justin Martyr (second century) promoted the resurrection of the flesh, even though it does not accord well with our intuitive concept of personhood, to distinguish their views from competing Neoplatonic and gnostic resurrection concepts, which mentioned a resurrection of the soul only (gnostic Christianity saw the material world as inherently evil, and the spiritual world as good). Over time, theologians came up with an ingenious solution to the problem of personal identity, which strongly resonates with our intuitive body-soul dualism. As we have seen, humans find it easy to think about a mind that survives the death of the body, and they are especially prone to do so when reasoning in a religious context. The immortal soul became an obvious way to preserve the identity of the deceased person in the time

between death and resurrection. As a result, the physicalist view of the resurrection disappeared, being supplanted by a dualist view that envisaged the continuation of the soul after death, until it was reunited with a physical body at the end of times (Murphy 2011). Possible homes for the soul in this intermediate state include the soul sleep and purgatory. This dualist account accords remarkably well with the weak dualism that humans intuitively possess, much better than with strong radical substance dualism (survival of the soul only) and physicalism (a person is identical to her body) that disappeared from Christianity during the early middle ages. The strong dualistic position never gained general popularity either; although it had its supporters (e.g., in the early modern period, Descartes defended a strong substance dualism), the received view remained weakly dualistic.

Weak dualism in theology differs from the lay audience's theologically incorrect beliefs about the afterlife. In a qualitative study of Protestant (Congregationalist) parishioners, Armstrong (2011) found that laypeople make no reference to an intermediate state at all, but rather, think that the deceased person reaches heaven (or more rarely, hell) immediately; there is no final judgment. They explicitly envision postmortem existence as a disembodied soul, but nevertheless continue to attribute physical characteristics to the dead, such as the ability to see, feel and hear. The recently deceased also appear to them in a physical form in dreams and visions. Thus, like the official theological understanding, laypeople's views are weakly dualistic but they are less coherent than the former—i.e., explicit affirmation of a survival of the soul only, combined with some reference to physicality—and are not in line with accepted doctrine, such as the Apostles' Creed (which explicitly affirms belief in the resurrection of the flesh, i.e., a physical body).

Today, physicalism is making a comeback in philosophical theology. Perhaps this is due to an increasing tendency for naturalism in philosophy, i.e., to incorporate findings from the sciences in philosophical discourse and metaphysical frameworks. Although results from neuroscience and cognitive psychology do not rule out dualism in a logical sense—an intangible soul could logically exist, even if brain states are causally responsible for mental states—they sit more comfortably with physicalism. However, even for theologians who are congenial to physicalism it remains difficult to flesh out how exactly life after death is possible from a physicalist viewpoint. For example, the philosopher of religion Peter van Inwagen (1978) proposed a "body-snatch" model of life after death, where God whisks bodies away at the moment of death, replacing them by a simulacrum that rots or burns in their place. Meanwhile, God prepares and stores the body for future resurrection at the Final Judgment. About this rather

contrived solution, van Inwagen (1998, 50) later wrote, “I am now inclined to think that there may well be other ways in which an omnipotent being could accomplish the Resurrection of the Dead [...], ways I am unable even to form an idea of because I lack the conceptual resources to do so.” Such casual remarks indicate that our intuitions limit what is conceivable at a theological level; even today, we find it easier to think that mind-stuff can survive physical death than body-stuff.

4.2 Confirmation Bias in Natural Theology

One of the best-attested content biases is confirmation bias. Unlike some other biases, such as susceptibility to the conjunction fallacy, confirmation bias does not attenuate as a result of schooling; highly educated people are as susceptible to it as those with less academic training. In line with this, several psychological studies (see, e.g., Nickerson 1998) indicate that scientists are subject to confirmation and disconfirmation biases when they are assessing and evaluating empirical evidence. In what follows, I will report findings from a recent empirical study that suggests that confirmation bias may also play a role in the acceptance of natural theological arguments.

Arguments in natural theology aim to establish or doubt the existence of God on rational grounds. Their premises are based on broadly shared intuitions (e.g., everything that has a temporal origin has a cause of its existence), ordinary experience, and scientific insights (e.g., the Big Bang theory indicates that the universe is finitely old). Using common reasoning strategies like deduction and inference to the best explanation, natural theologians derive the existence of God. For example, the *kalām* cosmological argument, developed by medieval Muslim theologians argues

1. Everything that begins to exist has a cause of its existence.
2. The universe began to exist.
3. Therefore, the universe has a cause of its existence.

In spite of the intuitive plausibility of premise (1) and empirical support for premise (2), contemporary theologians and philosophers of religion do not agree about the conclusion (3). Natural theological arguments indeed rarely persuade: few people lose or gain faith based on rational argument. Faust (2008) proposes that our acceptance or rejection of natural theological arguments depends on pre-existing religious beliefs: our acceptance of the premises depends on how plausible we find the conclusion. If she is correct, confirmation bias plays an important role in how we think about and evaluate natural theological arguments.

To test the role of confirmation bias in natural theology, I conducted an Internet survey among philosophers that probed the role of prior religious beliefs in the acceptance

of natural theological arguments. Respondents, who were recruited through philosophy mailing lists and blogs, were asked how strong they found a series of natural theological arguments, rating them from very weak to very strong (a scale from 1 to 5). They could also indicate whether they were insufficiently familiar with any of the arguments to give an answer. There were 802 respondents (mean age: 36.5 years), the majority of which (85.8 %) were professional philosophers; 75.8 % were male, a gender imbalance that reflects the maleness of the field. The religious self-identification of the respondents was 40.5 % theists, 40.4 % atheists, and 19.1 % agnostic. While this distribution may not be representative for philosophy, it does allow for robust comparisons between theists, atheists and agnostics.

In line with Faust’s predictions, I found that religious belief strongly influences the assessment of natural theological arguments. Table 1 provides an overview of the individual arguments. I computed two combined scores: one for the 8 arguments for theism, and one for the 8 arguments against theism. Answers had a moderate to high internal consistency. Chronbach’s alpha for the arguments for theism was .886, for arguments against theism it was .749. Since each individual argument could be rated from 1 to 5, and there were 8 arguments in each category, the minimum combined score was 8 (i.e., all arguments are rated as very weak), and the maximum score was 40 (i.e., all arguments are rated as very strong).

Theists rated natural theological arguments that support theism much more positively than atheists. The mean rating for these arguments was 25.5 (SD = 5.7) for theists, and only 13.4 (SD = 5.8) for atheists. Conversely, atheists rated arguments against theism more strongly than theists: atheists gave them a total score of 25.6 (SD = 6.9), theists 17.7 (SD = 4.7). Agnostics occupy an intermediate position, with a mean of 16.6 (SD = 5.2) for arguments in favor of theism, and 21.5 (SD = 5.8) for arguments against theism. A non-parametric test for independent variables, the Kruskal–Wallis ANOVA showed that these differences between theists, atheists and agnostics were statistically significant both for arguments for theism [$df(2) = 397.2$, $p = .0001$] and for arguments against theism [$df(2) = 217$, $p = .0001$]. The findings are summarized on Fig. 1.

While these results indicate a strong correlation between religious belief and appreciation of natural theological arguments, they do not by themselves establish the direction of causation. Some of the respondents may have been swayed by reasoned argument in coming to the religious beliefs they now hold. However, there are independent reasons for suspecting that the causal arrow goes from religious belief to acceptance of the arguments, rather than the other way. In their analysis of recent debates in philosophy of religion, Nichols and Draper (2013) identify a

Table 1 Religious arguments presented to participants—the order of the arguments was randomized for each participant

Arguments for theism	
Cosmological argument	
Ontological argument	
Argument from miracles	
Moral argument	
Argument from religious experience	
Argument from beauty	
Pragmatic argument for theism	
Argument from design	
Arguments against theism	
Argument from inconsistent revelations	
Argument from poor design	
Argument from evil	
Argument from parsimony	
Argument from divine hiddenness	
Pragmatic argument against theism	
Argument from incoherence	
Argument from lack of evidence	

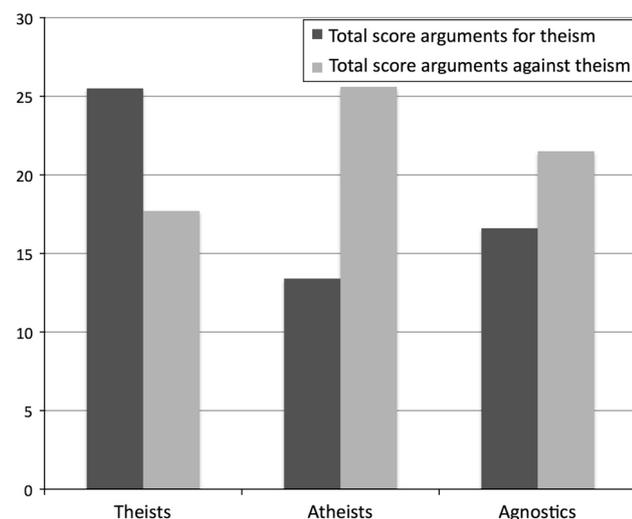


Fig. 1 Mean total scores of arguments for theism (dark grey bars) and arguments against theism (light grey bars), given by theist, atheist, and agnostic philosophers

strong partisanship in the discipline: authors who defend arguments in favor of theism (e.g., Craig, Plantinga) tend to start their philosophical career as theists, whereas those who defend arguments against theism (e.g., Rowe, Schellenberg) started as atheists. Few authors change their metaphysical outlook over time as they debate these arguments.

Another indication that confirmation bias plays a strong role is that differences in appreciation of natural theological arguments persist even among professional philosophers of religion with extensive background knowledge of

theology. Religious belief is in fact a better predictor of how strong philosophers find individual arguments than philosophical specialization (i.e., whether or not the participant has philosophy of religion as an area of specialization). For instance, for the cosmological argument, theists in the sample are 23.12 times as likely as atheists and 6.93 times as likely as agnostics to rate the cosmological argument as strong or very strong ($p < .0001$ for both statements). Participants who are philosophers of religion (controlling for other factors like gender and religious belief) are 1.53 times as likely as those who were not to rate the cosmological argument as strong or very strong ($p = .01$).² If confirmation bias continues to play a role in natural theological argumentation, this can explain why their persuasive force remains limited, in spite of their ever-growing sophistication.

4.3 Coherence as a Condition for Cultural Success

Theological discourse typically takes place within an argumentative context. This is not restricted to verbal argument: wars were fought over seemingly trivial issues such as whether or not the Son is of the same or of similar substance as the Father (*homoousios* versus *homoiousios*), whether Mary was the mother of God, and whether or not bread and wine actually transubstantiate into body and blood (see Jenkins 2010, for a historical account). In argumentative contexts, people show an increased epistemic vigilance toward their interlocutors. Mercier and Sperber (2011) outline two main mechanisms for monitoring information in such contexts: calibrating trust in the speaker (a context bias) and checking the coherence of the message (a content bias). As we have seen, coherence checking occurs in everyday communication, and plays a role in monitoring the plausibility of religious claims. In an argumentative context, coherence checking will be more extensive than in ordinary communication. As a result, theologians not only scrutinize the coherence of their rivals' accounts but also try to make their own position less vulnerable to attacks by increasing its internal and external coherence. External coherence means that a new theological concept needs to accord with established theological views, with well-entrenched non-theological beliefs, and, in traditions that accord a special status to holy written texts, with scripture. Internal coherence indicates the extent to which a theological view is internally consistent.

A striking illustration of coherence checking in theology is al-Ghazālī's critique of Greek-inspired philosophical teachings. In *The incoherence of the philosophers* [eleventh

² These ratios were computed using an ordered logit/cumulative logit model. Thanks to Robert O'Brien, a medical statistician at Miami University, for help with this calculation.

century (1963)], the Muslim theologian al-Ghazālī attacked 20 doctrines that were held by *al-falāsifa*, Muslim philosophers influenced by Neoplatonism and Aristotle. He criticized their positions by using their own standards of rational acceptability against them and by pointing out their incoherence with scripture. The *falāsifa* held high standards of acceptability: only beliefs that were demonstrable through rational argument were acceptable; as a result, some of them denied claims from the Qu’ran and *hadīth* (orally transmitted sayings of the prophet Muhammad). This was unacceptable for al-Ghazālī: coherence with scripture and tradition was essential for him (as it is in most later Muslim theology). Moreover, al-Ghazālī also demonstrated that many of these claims, such as the eternity of the world and the denial of bodily resurrection, also rested on unproven assumptions from Greek metaphysics (which, for instance, held that the world was eternal). Thus, the philosophers themselves fell short of the high standards they had set for knowledge (Griffel 2009).

The Christian theologian Irenaeus [second century (1884)] employed a similar strategy to argue against gnosticism. Scrutinizing their origin myths, he argued that many gnostic teachings were internally incoherent. For instance, he derided the origin myth where Sophia (Wisdom) is frustrated by her own ignorance, overreaches herself, and falls. This is impossible, according to Irenaeus, since wisdom per definition cannot be ignorant. Furthermore, he argued that the gnostic teachings deviated from generally accepted doctrines that had been faithfully handed down from the time of the apostles. As evidence for this, he argued that the catholic tradition was internally coherent, whereas the gnostics consisted of many splinter groups that contradicted each other. If, Irenaeus held, they can’t even agree among themselves on basic theological views, believers need not take them seriously—a view that underplayed the internal strife within the catholic tradition (Ehrman 2003, 189).

This important role of internal and external coherence had a remarkable result: most of the accepted theological doctrines today are surprising and highly counterintuitive, far less cognitively accessible than the restricted counter-intuitiveness of ordinary religious beliefs. For instance, the Chalcedonian definition (an ecumenically agreed doctrine about Christ’s nature from 451) states that Christ has two natures: he is both entirely divine and entirely human. The doctrine reflects the rejection of two heretic viewpoints: docetism, according to which Christ only seemed to be human, but was actually divine, and adoptionism, according to which Jesus was fully human but not divine, and only became the Son of God by adoption. Both views are more intuitive than the Chalcedonian definition. However, when fully developed, it is hard to bring them in line with other accepted Christian doctrines. Consider the atonement: if

Christ was not fully human and did not really suffer (as docetists claimed), how could his death atone for the original sin all humans inherited from Adam? Conversely, if Christ was not divine, how could he rise from the dead and work miracles? Christians were thus faced with the challenge to provide christology that was consistent with their rejection of both docetism and adoptionism. The result, after centuries of deliberation and tweaking, was the highly counterintuitive dual-nature model of Chalcedon, in which Christ inextricably unites two natures in one person.

When reciting creeds today, believers are in a sense reiterating the early history of theology, as many tenets in the creeds are formulated as an explicit rejection of heretic doctrines. The Nicene Creed starts with “I believe in one God,” which is an explicit rejection of Marcionism, an early Christian movement that distinguished two Gods. It goes on to state that Jesus is the Son of God, eternally begotten of the Father, a rejection of adoptionism, according to which Jesus did not pre-exist his human form. Lest we be in any doubt about the number of Gods, the Creed continues to specify that Jesus is of the same substance (*homoousios*) as the Father, a rejection of Arianism and other views that saw Jesus as being of similar, but not of the same substance (*homoiousios*) as the Father. The emphasis on Mary as the mother of Jesus rules out both ebionism (which denies the virgin conception) and docetism. Orthodoxy in theology has been shaped by attempts to outline an internally consistent position that is distinct from the views its proponents opposed: many theological concepts are shaped by content biases that favor coherent over incoherent accounts, and that favor beliefs that are in line with already accepted views.

5 Conclusion

Theological concepts are culture-specific, reflective beliefs that are often hard to grasp even for specialists. They share these properties with scientific and philosophical beliefs. How can we explain their strangeness, in light of the observation that their cultural evolution was influenced by content biases that also underlie our acceptance of ordinary religious beliefs? As we have seen, a key difference between theological and folk religious concepts is the argumentative context in which they are formulated. Theologians have to make claims that are in line with established theological tradition, scripture, and other beliefs (e.g., scientific beliefs, intuitions). Juggling all these competing demands, they end up making claims that are far less intuitive than ordinary religious beliefs. Schwitzgebel (2013) remarked that any well-developed philosophical metaphysical position will invariably end up looking highly counterintuitive—positions he denotes as “crazy.”

In a technical sense, “crazy” beliefs are contrary to common sense; we are not epistemically compelled to believe them. Metaphysicians start out from intuitive, almost banal, claims, such as “ $5 + 5 = 10$,” and “I had eggs for breakfast.” From these views they derive bizarre notions such as the existence of abstract Platonic entities and the view that all possible worlds exist. One plausible reason for this is that intuitive ontologies are not highly consistent. Although humans aim for some coherence in their reflective beliefs, intuitive beliefs can often be at odds with each other.

Applied to theology, we can discern why theological beliefs seem so different from ordinary religious beliefs. Intuitive ontologies continue to play a role in the cultural transmission of theological beliefs. Theologians are not immune to content biases that play a role in everyday reasoning, such as confirmation bias. Because theological reflection takes place in an argumentative context, internal and external coherence play a more prominent role in theological discourse than in contexts where ordinary religious beliefs are communicated. However, this discrepancy between intuitive ontologies and theological concepts should not lead us to conclude that theological concepts are somehow “unnatural,” outside the reach of the content-based approach of CSR.

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