Does "Think" Mean the Same Thing as "Believe"? Linguistic Insights Into Religious Cognition

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Abstract

When someone says she believes that God exists, is she expressing the same kind of mental state as when she says she thinks that a lake bigger than Lake Michigan exists—i.e., does she refer to the same kind of cognitive attitude in both cases? Using evidence from linguistic corpora (Study 1) and behavioral experiments (Studies 2-4), the current work provides evidence that individuals typically use the word "believe" more in conjunction with statements about religious credences and "think" more in conjunction with factual statements, pointing to two different understandings of claims made with these two terms. These patterns do not appear to reflect low-level differences based on the amount of consensus surrounding a particular claim, the extent to which the truth of a particular claim is known to the participant, or linguistic differences between religious and factual statements. We discuss implications of these findings for religious cognition (e.g., as supporting the theory that religious credences are qualitatively distinct from factual beliefs) as well as cognitive processes more broadly. Finally, we relate the present findings to prior theoretical work on differences between factual belief and religious credence.

Keywords: belief; cognitive science of religion; credence; epistemology; religious cognition

Does "Think" Mean the Same Thing as "Believe"?

Linguistic Insights Into Religious Cognition

When it comes to talking about mental states, does the word "think" mean the same thing as the word "believe"? More specifically, do phrases like "so-and-so thinks that *p*" typically report the same kind of mental state as "so-and-so believes that *p*"? One intuitive view is that "believe" often has a more religious meaning than "think," which has a more matter-of-fact meaning. Many philosophers and cognitive scientists, however, write as if "think" and "believe" are interchangeable—at least when it comes to reporting propositional attitudes. Such writing implicitly assumes the view that "thinks that *p*" and "believes that *p*" mean the same thing.[1]

The current studies seek to discover which view is more likely to be correct. We hypothesize that speakers of American English typically use "believe" to report religious credences and "think" to report factual attitudes toward propositions. We are not suggesting that the *only* function of "think" and "believe" is to track the difference between religion and fact; rather, we hypothesize that a striking pattern of differential usage along these lines does exist. For example, we predict that ordinary speakers of American English are more likely to say, "Shaun <u>believes</u> that Jesus is Lord" than they are to say, "Shaun <u>thinks</u> that Jesus is Lord." Relatedly, our hypothesis also proposes that they are more likely to say, "Shaun <u>thinks</u> Lake Superior is the biggest Great Lake" than they are to say, "Shaun <u>believes</u> Lake Superior is the biggest Great Lake."

[1] For example, many psychologists who deploy the "false belief" task write that participants who can accurately report on where a character erroneously "thinks" an object is are able to keep track of the character's false "beliefs" or what the character falsely "believes" (e.g., Fabricius, Boyer, Weimer, & Carroll, 2010; Gopnik & Astington, 1988; Roth & Leslie, 1991; Surian & Leslie, 1999). In philosophy, a good example is Feldman (2007), who writes on peer disagreement as if disagreement in terms of what people "think" and disagreement in terms of what people "believe" amount to the same thing.

The background theoretical position that motivated our hypotheses is what we call the Varieties of Belief Thesis, which posits that the set of mental states that cognitive scientists (as opposed to laypeople) generically call "beliefs" in fact contains distinct cognitive attitudes. Cognitive attitudes are mental states that represent how the world *is* or *might be* (Shah & Velleman, 2005) and include factual beliefs, fictional imaginings, suppositions, religious credences, and many related representational mental states; all of these portray the world as being (or possibly being) a certain way.[2] Cognitive attitudes are typically thought of as forming a subset of propositional attitudes (many propositional attitudes are not cognitive attitudes, e.g., desires, hopes, and wishes, which are *conative* attitudes [Bratman, 1987; Van Leeuwen, 2009; Velleman, 2000]). Even setting the *contents* of those various cognitive attitudes aside, their ways of relating to and processing ideas differ (Skolnick & Bloom, 2006). The Varieties of Belief Thesis holds that various sub-types of "belief" will also turn out to be distinct cognitive attitudes—distinct ways of processing ideas. The present work tested this idea by determining the extent to which laypeople speak differently about different sub-types of "belief." If different patterns of word choice exist for reporting religious cognitive attitudes versus factual cognitive attitudes, this would provide support for the idea that laypeople treat religious credence as

[2] This is a different use of the word "attitude" from what is common in most social psychology writings, where "attitude" is used to refer to a more general positive or negative outlook toward some group of people or subject matter. However, the use deployed in this paper is common in philosophy and in developmental psychology, where it usually appears in the phrase "propositional attitude," which designates a certain way of relating to a proposition. For example, Leslie (1994) writes about "the attitudes agents take to the truth of propositions" (p. 211), which is essentially the same use of the word "attitude" as ours. And he also refers to "[t]wo early attitude concepts, pretends and believes," which aligns with our use of "belief" and "factual belief" as *attitude* types. Wellman (1990) also uses "attitude" in this fashion (as a part of the phrase "propositional attitude"). A general framework for understanding the notion of an attitude in the sense we deploy is laid out in Fodor's (1985) "Fodor's Guide to Mental Representation."

distinct from factual belief and hence for the idea that there may be differences in kinds of "belief" after all, as The Varieties of Belief Thesis maintains.

A number of theorists have advocated positions that imply the Varieties of Belief Thesis. Atran (2002) distinguishes "commonsense beliefs" from "symbolic beliefs" and explains that the two kinds of mental state have different manners of processing. Heiphetz, Spelke, Harris, and Banaji (2013, 2014) develop a tri-partite distinction between factual beliefs, religious beliefs, and preferences. Van Leeuwen (2014, 2017) argues that *religious credence* is distinct from *factual belief*. And Bloom (2015) generalizes Van Leeuwen's idea of credence to the political realm, suggesting that ideological credences also differ from factual beliefs. Each of these theorists may be tracing somewhat different distinctions.[3] But what they have in common is the idea that various "beliefs" differ substantially in kind—that is, the generic category of "belief" (as that term is used by philosophers and psychologists) contains distinct cognitive attitudes.[4]

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[3] Some related distinctions also occur in the philosophical literature. For example, Dennett (1978) distinguishes what he calls *belief* from *opinion*, and Alston (1996) appeals to Cohen's (1992) distinction between *belief* and *acceptance* to argue that religious faith needn't involve the attitude that philosophers (as opposed to lay people) normally refer to as *belief*. Both positions, as we interpret them, cohere with the Varieties of Belief Thesis.

[4] Sperber (1982/1985, 1997) might, on some readings, count as an advocate of the Varieties of Belief Thesis. But it is important to see that his approach is also unique. Sperber (1997) distinguishes *intuitive beliefs* from *reflective beliefs* (updating his 1982/1985 terminology of "factual beliefs" and "representational beliefs"). Intuitive beliefs are those that are directly stored in long-term memory and have strong rationality constraints; ordinary beliefs that have contents along the lines *my cat is black* would typically turn out to be intuitive, on Sperber's framework, since that information is directly stored in memory and is (for the most part) constrained by consistency demands with other items so stored (such the information *that I have a cat*, *that black is a color*, etc.). On the other hand, reflective beliefs are at least in part about *a representation* (linguistic or otherwise); for example, when a Christian says she believes that Christ was begotten, not made, what she most likely really believes is something along the lines *that the Nicene Creed says that Christ was "begotten, not made."* Thus, in this example, the "begotten, not made" portion of the content is stored *indirectly*, in the context of what Sperber calls a *validating context*—in this case *the Nicene Creed says…* is the validating context. This combination (validating context + storage of some constituents *as* quoted representations) is what, for Sperber, characterizes reflective belief. Insofar as Sperber holds that one's mind

The Varieties of Belief Thesis is primarily about internal psychological states. The hypotheses we tested, on the other hand, are primarily about the *language* that laypeople use to talk about such states. So how does the Varieties of Belief Thesis help explain our hypotheses? Neurotypical humans are attuned to the mental states of themselves and others; they attribute desires, emotions, goals, thoughts, and perceptions to others, largely relying on intuitive mechanisms that emerge early in development (Baillargeon, Scott, & Bian, 2016). They are also sensitive to differences in cognitive attitudes; from an early age, they distinguish what is playfully imagined from what is factually believed and what is counterfactually imagined from what is factually believed (Byrne, 2005; Taylor, 1999; Weisberg, 2013). Given these sensitivities to mental states, if the Varieties of Belief Thesis is true, then it may also be true that neurotypical humans are sensitive—at least at an implicit level—to differences in kinds of "belief." As noted, Heiphetz et al. (2013, 2014) presented evidence that children in early elementary school already make differentiations along these lines. The present hypotheses extend that line of research in a way that suggests that the human ability to distinguish different kinds of "belief" manifests itself in word choice: when people are reporting propositional attitudes, they are likely to use "think"

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processes the embedded quotational contents *differently* from how it processes ordinary intuitively believed contents, he agrees with the Varieties of Belief Thesis. *However*, Sperber's work can also be read to suggest that one always holds reflective beliefs *by way of* holding intuitive beliefs; that is, a reflective belief *just is* an intuitive belief with a more elaborate constituent structure (namely, validating context plus quoted representation). Insofar as that is true, Sperber departs from what we are calling the Varieties of Belief Thesis, since he is effectively positing one overarching attitude type (intuitive belief) that ultimately specifies the processing for all beliefs (albeit for some by way of a more complicated route). To put it simply, Sperber tries to get differences in *representational structure* to do the explanatory work that someone like Van Leeuwen (2014, 2017) tries to do (in part) with differences in *attitude*. For this reason, we are hesitant to count Sperber as someone who unqualifiedly maintains the Varieties of Belief Thesis, since that is a thesis about attitudes. Still, it should be apparent that, with suitable amendments, Sperber could agree with something very close to that thesis.

and "believe" to refer to different underlying cognitive attitudes.[5] If there are different kinds of "belief" (as The Varieties of Belief Thesis claims) and people can track them (as developmental psychology suggests), then vocabulary that tracks such differences should also exist, especially given that the existence of words that express epistemic states appears to be linguistically universal (Goddard, 2010; Wierzbicka, 2007).

To see the theoretical importance of the present work, it is worth contrasting the predictions of the Varieties of Belief Thesis with the predictions of another view, the Single Belief Thesis, which holds that there is only *one* attitude type that falls under the cognitive scientist's label "belief" (Boudry & Coyne, 2016a, 2016b; Harris et al., 2009; Levy, 2017). On such a view, one's "belief" that some ordinary person is alive involves the same attitude type as one's "belief" that Christ is alive—only the contents are different. Now consider how such "beliefs" might be reported in ordinary speech. The options are: (1) "Sally thinks that Jim is alive," (2) "Sally believes that Jim is alive," (3) "Sally thinks that Christ is alive," and (4) "Sally believes that Christ is alive." If the Varieties of Belief Thesis is true, then (1) and (4) are more likely than (2) and (3). The Single Belief Thesis, however, does *not* predict that a pattern of differences should emerge, since that thesis would say that (1)-(4) report the same type of attitude. The Single Belief Thesis does not rule out a difference, but it gives no reason to think one should exist either. Thus, testing our hypothesis helps in adjudicating between the Varieties of Belief Thesis and the Single Belief Thesis. Absent a viable alternative explanation, finding support for our hypothesis favors the Varieties of Belief Thesis. If this occurs, an advocate of the

[5] Again, to be clear, it is logically consistent to accept the truth of our (linguistic) hypothesis without accepting the deeper (psychological) Varieties of Belief Thesis. But interpreting the hypothesis in light of that thesis is one compelling option that coheres with other theoretical work. See our General Discussion.

Single Belief Thesis would have to appeal to *additional* factors, besides attitude type, to explain the results. Accordingly, our studies addressed the plausibility of appealing to such additional factors.

Study 1 used corpus linguistics to explore two questions: (1) whether religious words like "God" and "miracles" were more likely to appear after forms of "believe that" than after forms of "think that" and (2) whether "think" or "believe" was more likely to appear *before* phrases that express religiously oriented propositional attitude complements, such as "that God exists" or "that the Bible says." Studies 2-4 used experimental psychology methods to determine whether laypeople are more likely to use the word "thinks" in connection with factual belief attitude reports and "believes" in connection with religious attitude reports. Importantly, Study 4 used vignettes to suggest different attitudes (religious versus factual) that might be taken to the *same* reported contents (for example, the phrase *that aspirin is not a cure* following a vignette suggesting a religious or fact-based context); thus, Study 4 enabled us to address content-based (as opposed to attitude-based) interpretations of our hypotheses.

Study 1: Corpus Data About "Think" and "Believe"

Linguistic corpora are large bodies of naturally produced text—i.e., language consisting of news articles, speech transcriptions, magazine stories, and other pieces that were produced without the original intent of linguistic analysis. The Corpus of Contemporary American English (COCA) contains over 520 million words going back to 1990. COCA's texts are evenly divided between *spoken* (transcriptions of speech), *fiction, magazine*, *newspaper*, and *academic* sources. We relied on COCA because it is a large, standard, and balanced (i.e., including even portions of text from multiple sources) contemporary corpus of American English.

Method[6]

Corpus searches can provide raw data about word *frequency*. In the entire corpus, how many times is some form of the verbs "believe" and "think" used? The answers are 78,667 and 484,477, respectively. One simple frequency by itself does not reveal much, but corpora allow *comparisons*: the fact that forms of "think" are used 6.16 times as often as forms of "believe" may lead someone to wonder why. The third major type of data that corpora are good for is *collocations*. Which words tend to occur in the company of which others? A collocate of a word is another word or phrase that occurs in its company substantially more often than would be expected by chance, given the background frequencies of the respective words or phrases. Data about collocation combined with frequency allow researchers to test hypotheses on topics ranging from word connotation to the popularity of a given stock phrase.

We investigated whether "believe" is more likely to be used for reporting religious attitudes than "think" is by comparing the collocates of the two verbs across different forms, and we focused specifically on "think that" and "believe that," since our concern was with cognitive attitude reports. We also checked whether religious propositional complement phrases (e.g., "that God exists") were preceded more often by "think" or "believe." We predicted that "believe" would appear as a collocate of religious propositional complements significantly more than "think"—both in terms of frequency and in terms of strength of association.

Finding 1: "Believe That" Has Religious Collocates, While "Think That" Has None

A standard measure for whether one word is associated with another word in a significant way is a *Mutual Information (MI) score*, which compares how often two

[6] All work described here received IRB approval from the first author's university (*Perceptions of transformation*, #AAAQ9818) and the last author's university (*Does "thinking" mean the same thing as "believing"?* #1H5532).

words occur near each other and how often those words would be *expected* to occur near each other by chance.[7] For example, "socket" has a high MI score in relation to "eye" (9.57) when one searches one word to the right of "eye," due to the common phrase "eye socket." By convention, an MI score above 3.00 constitutes good evidence that two words are associated in a meaningful way. One can also search by lemma, which encompass all grammatical forms of a word; the lemma *believe* includes "believe," "believes," "believing," and "believed."

On doing an initial probe to compare the lemma *believe* to the lemma *think* (four spaces to the right; MI score > 3.00; frequency of four or more),[8] we discovered that *believe* has many religious collocates, while *think* has none. Of a total list of 113 collocates for the lemma *believe*, fourteen (12.4%) were overtly religious. Each is listed here, followed by the frequency and MI score in parentheses: God (2140; 3.36), miracles (148; 4.92), reincarnation (62; 6.09), afterlife (46; 4.65), redemption (42; 3.20), sanctity (33; 4.29), Allah (24; 3.05), Messiah (19; 3.18), Creationism (11; 3.64), devoutly (7; 4.20), exorcism (7; 3.32), transubstantiation (6; 5.22), reincarnated (4; 3.36), and Anti-Christ (4; 3.10). In addition, eight collocates were peripherally religious, by which we mean words associated with the supernatural without being as directly connected to organized religion: ghosts (143; 4.32), fervently (40; 5.05), supernatural (37; 3.05),

[7] The MI score in COCA is calculated with a standard formula: MI = log((AB * sizeCorpus) / (A * B * span)) / log(2). [log(n) here is short for log10(n).] In this formula, A is the frequency of the node word; B is the frequency of the collocate; AB is the frequency with which they occur together in the defined span; and span is the span of words. See http://corpus.byu.edu/mutualInformation.asp. For more on MI score, see Hunston (2002).

[8] We demanded a frequency of occurrence over four because the formula for MI score can give inflated values when the frequency is very low.

witches (28; 3.38), karma (22; 3.84), omens (20; 5.47), astrology (15; 4.57), and superstitions (9; 3.59).[9]

Although this list is highly suggestive—as is the absence of religious collocates for *think*—it does not provide the most relevant comparison for our hypothesis, since our focus is a difference that would occur in *cognitive / propositional attitude reports*. The search for collocates of *think* and *believe* by themselves also brings up forms of "think" referring to entertaining or cogitating (e.g., "he's thinking about life"), as well as forms of believe such as "believe me" or "believe in," which do not directly report cognitive attitudes. As our introduction indicates, we wanted to compare sentences like "S thinks that *p*" to "S believes that *p*."

Thus, we probed COCA's entire body of corpora for collocates of the lemma "*believe* that" within four words to the right to obtain a list of all collocates with an MI score of 3.00 or above (frequency > 4). We searched four words to the right because the contents of attributed mental states are typically reported after the relevant mental state verb (e.g., "He believes *that God is always watching*"). The list of overtly religious collocates for "believe that" is as follows: miracles (14; 3.37), Allah (9; 3.49), and scriptures (5; 3.01). The peripherally religious collocates are as follows: witches (7; 3.22)

[9] Admittedly, the dividing line between overtly religious words and peripherally religious words is fuzzy, and there are several words that are candidates for being peripherally religious that we did not include: "UFOs," "Martians," "bigfoot," and "conspiracies." This particular list of words suggests another category that may be of interest with respect to the Varieties of Belief Thesis: conspiracy theoretic beliefs. Although exploring this suggestion is beyond the scope of the present manuscript, there is some reason to think that the psychodynamic properties of conspiracy theoretic beliefs resemble those of religious credences (cf. Shenhav, Rand, & Green, 2012; Swami, Voracek, Stieger, Tran, & Furnham, 2014).

and celibacy (4; 3.19).[10] This is, of course, a shorter pair of lists than the respective lists for *believe* without "that." However, since "believe that" is a longer phrase, it has fewer collocates altogether that meet the specified parameters. That is, it only has 51, which means that 9.8% of its collocates within the specified parameters are overtly or peripherally religious. Furthermore, "God" almost reached the MI score threshold for "believe that" at 2.92 with 437 occurrences. Other religious words that rose near the level of significance in combination with "believe that" were "Jesus" (110; 2.95), "baptism" (5; 2.83), and "sinful" (4; 2.97).

The comparison with the lemma "*think* that" is telling, as this phrase has no religious collocates. The collocate closest to religion is "monogamy" (4; 3.12), which is also a collocate for "believe that" (4; 3.99); we did not count it as religious in either case. Importantly, "God" does not associate meaningfully at all with "think that" (132; 0.32). Additionally, the near-threshold collocates for "believe that" are much less associated with "think that": Jesus (43; 0.73), baptism (no occurrences), and sinful (no occurrences).

Finding 2: Finding 1 Holds Across Five Sub-Corpora

COCA contains five different sub-corpora (spoken, fiction, magazine, newspaper, and academic), allowing us to investigate whether the difference in religiosity between "think" and "believe" is due to a particularly skewed subset of texts. The religiosity of "believe" indeed obtains across sub-corpora. In the spoken corpus, 17.6% of the significant collocates for "*believe* that" are either overtly or peripherally religious. For fiction, magazine, news, and academic sources, those numbers are, respectively, 7.1%,

[10] We initially included Zionism (4; 3.83) as peripherally religious. But Zionism can be considered more of a secular than religious movement, although there are religious forms of Zionism as well.

26.1%, 16.0%, and 4.8%. In contrast, the lemma "*think* that" had no overtly or peripherally religious collocates in any sub-corpus.

Finding 3: Religious Propositional Complements Are More Likely to Be Associated with "Believe" than with "Think"

The findings thus far show that "*believe* that" is much more likely to be *followed by* terms for religious notions than is "*think* that." One might worry that the failure of religious terms to be collocates following "*think* that" may just be due to the fact that *think* has *other* functions that dilute its association with religious notions. *Think* might be as likely as *believe* to be used in religious cognitive attitude reports, but words like "God" may appear more often as collocates of *believe* simply because *think* reaches into so many other contexts. Thus, we tested whether forms of "think" or "believe" are more likely to *precede* religious propositional complements (and hence report religious cognitive attitudes) by selecting fourteen propositional complements that we thought were especially likely to appear in the corpus with an attitude verb preceding them. The complements we investigated were chosen *a priori* as being especially likely to appear in the corpus due to their general nature. We looked for collocates to the *left* of these propositional complements to see if forms of either "think" or "believe" were among the significant collocates (four spaces to the left; MI score > 3.00; frequency of four or more). For completeness, we searched for preceding collocates of the propositional complements both *with* and *without* the word "that," yielding 28 total phrases: (that) God exists, (that) Allah exists, (that) Yahweh exists, (that) God is, (that) Allah is, (that) Jesus is, (that) Satan is, (that) the Devil is, (that) angels are, (that) the Bible is, (that) the Bible says, (that) the Koran says, (that) the Torah says. The forms ending in "is," "are," and "says" were deliberately left open ended in order to capture the

maximum range of propositional complements that begin in these fashions. We did not search or analyze any propositional complement phrases other than the ones listed here.

The results supported our first hypothesis. There were fourteen collocations between religious propositional phrases and preceding forms of "believe"; there were zero collocations with preceding forms of "think." For example, some form of "believe" preceded the phrase "that God is" a total of 47 times; some form of "think" preceded that phrase only 13 times.[11] Recall also that forms of "think" occur in the corpus overall 6.16 times as often as forms of "believe," so the greater frequency of forms of "believe" before "that God is" is especially striking. Accordingly, "believe" and "believes" had MI scores of 5.39 and 5.66 in relation to "that God is." The MI score for "think" was 1.71, and there were no other forms of "think" that occurred in relation to that phrase within the specified search. See Supplemental Materials for a summary table.

Discussion

Findings 1-3 support our prediction and suggest that people are more likely to use "believe" than "think" to report religious cognitive attitudes. Because COCA is a large body of naturally occurring text, Study 1 probed American English extensively. But Study 1 also has

[11] One might wonder how it is possible that "think" could precede the phrase "that God is" 13 times without being a collocate of it. If *A* is a collocate of *B*, that means that the word (or phrase) type *A* occurs in the company of the word (or phrase) type *B* significantly *more often* than would be expected by chance. If *A* occurs in the company of *B* one or more times, but the frequency of co-occurrence is at or below the level expected by chance (given the frequencies of *A* and *B* in the corpus overall), then *A* does not count as a collocate of *B*. For example, "sing" occurs within four spaces to the right of "dog" exactly once in the entire corpus. But this does not make "sing" and "dog" collocates because these are both frequent words, which means one co-occurrence is completely unsurprising (in fact, the relevant MI score is negative [-2.70]). So it is also unsurprising that "think" is not a collocate of "that God is," even though it precedes that phrase 13 times. The word "think" and the phrase "that God is" are both so common that 13 co-occurrences is not enough to indicate a meaningful association.

serious limits. While we found support for the view that "believe" has a usage (among others) for religious attitudes, Study 1 does not support one way or another the view that "think" is used preferentially (in comparison with "believe") to report factual beliefs. This limitation exists because no body of words is particularly factual in nature, since there can be facts about anything. A further limitation of Study 1, like all corpus studies, is that all contexts were pre-existing; therefore, it was impossible to explore speaker tendencies dynamically. In principle, we want to know *which aspect* of the word "believe" is responsible for its association with, say, "God." To explore this issue more fully, we needed to be able to hold certain features of sentence contexts fixed while varying others to see what people then produce; we could then find out if the association continues to hold under certain controlled conditions. Thus, although Study 1 was highly suggestive, additional support was still needed from studies in which speakers *generate* verbal behavior in response to different kinds of context.

Study 2: Attitude Report Contexts (Forced Choice)

Study 2 required participants to choose a missing word (grammatical variants of "think" or "believe") to complete sentences about religious or factual matters. This approach allowed us to test whether (1) the patterns we found in Study 1 would extend beyond the particular collocates that we happened to find for "*believe* that" and (2) speakers of American English use distinct attitude verbs in mental state attributions on the basis of other cues (in this case, the contents of a *that* clause). Because Study 2 allowed us to create diverse religious and factual attitude reports, we were also able to examine potential differences among different factual contexts. We included three types of factual contexts to determine if differences would emerge among them or whether participants are particularly likely to use "think" for a diverse array of factual attitude reports. Creating different types of factual contexts also allowed us to rule out

several alternative explanations for the differences that emerged across religious and factual attitude reports in Study 1.

Participants completed four types of sentences with a form of the word "think" or a form of the word "believe": religious attitude statements (e.g., "Zane _____ that Jesus turned water into wine"), statements about attitudes toward well-known facts (e.g., "Fred and Yuriana _____ that George Washington was the first U.S. President"), statements about attitudes toward esoteric facts that are not known to the average layperson (e.g., "Nick _____ that cassiterite is the chief source of tin"), and statements about attitudes toward factual information concerning one's everyday life (e.g., "Sharon _____ that she will meet her mother at the grocery store today"; see Supplemental Materials for all items). We included these types of factual attitude statements for the following reasons: First, individuals might use "think" for widely accepted views and "believe" for views that are less widely accepted. In this case, participants would be expected to use "think" for well-known facts and "believe" for esoteric facts, which are not widely accepted because most people do not know the relevant information. Second, it is possible that individuals use "think" for information that they know and "believe" for information that they do not know. In this case, participants would be expected to use "think" for well-known facts and "believe" for esoteric and life facts, since the life facts describe situations unknown to the participants. However, finding the same difference between factual contexts and religious contexts *across* three different factual contexts would support the idea that participants actually attribute different *cognitive attitudes* by using "thinks" versus "believes," since several other differences in the epistemic status of the propositional complement would not explain the observed variation.

Method

Participants. The sample included 75 adults who were recruited via Amazon Mechanical Turk and received $1.50. The sample size was based on recommendations stating that psychological studies should recruit approximately 50 participants per cell (Simmons, Nelson, & Simonsohn, 2013); we over-recruited in an effort to reach a total of 50 participants whose data were usable after excluding participants who failed an attention check. Sample sizes in Studies 3-4 were determined to be consistent with the sample size of Study 2. Data from one additional individual were excluded because she did not correctly answer an attention check question at the end of the study, which asked participants to recall any one of the experimental items they had answered. Here and in subsequent studies, similar patterns to those reported emerged when analyzing data from all participants.

Here and in all subsequent studies, all participants were United States residents. On a demographic questionnaire completed at the end of the session, 47% indicated that they were female and 52% indicated that they were male; one additional participant indicated that their gender was "other." Participants also self-identified as White or European-American (80%), Black or African-American (5%), Asian or Asian-American (8%), Hispanic or Latino/a (4%), and Multiracial (4%). Further, participants self-identified as Protestant (15%), Catholic (12%), Christian: Other (7%), Pagan (3%), and None (63%); one additional participant did not respond to this item. Although the majority of participants selected "none" as their religious affiliation, participants were not strongly atheistic. When asked about their attitude toward God, 28% selected the option "God exists," 28% selected "God does not exist," 23% selected "we cannot know whether God exists," 20% selected "a higher power exists but we don't know what it's like," and 1% selected "Other." Participants indicated how important this attitude was to them (1=not important at all to 7=of the utmost importance, M=3.60, SD=2.39) and how certain they

were in this attitude (1=not certain at all to 7=completely certain, *M*=5.12, *SD*=1.96). Participants also indicated how often they attended religious services using a scale from 1 ("once a year or less") to 4 ("every week or more often"). On average, participants reported attending services "once a year or less" (*M*=1.44, *SD*=.86).

Procedure. Participants were instructed that they would read multiple sentences that contained a missing word and that they should select which of two options "makes the most sense of the sentence as a whole." Each item contained two response options: a form of the word "think" (e.g., think, thinks, thinking) and a form of the word "believe" in the same tense. Which word appeared first was counterbalanced. Participants viewed 15 religious attitude statements and 15 factual attitude statements (five well-known, five esoteric, and five life facts). The 30 items were randomized across participants.

Results and Discussion

Each response was coded as 1 if participants selected some form of "believe" and 0 if participants selected some form of "think." We used a paired-samples *t*-test to compare the proportion of trials on which participants selected the word "believe" when responding to religious versus factual items. Confirming our hypothesis, participants were more likely to select "believe" when responding to religious items (*M*=.89, *SD*=.15) than when responding to factual items (*M*=.18, *SD*=.16, $t(74)=22.02$, $p<.001$, Cohen's $d=2.54$).

To examine finer-grained differences among religious attitude reports and the three types of factual belief reports, we conducted a one-factor, four-level (Attitude Type: religion vs. well-known fact vs. esoteric fact vs. life fact) repeated-measures ANOVA. This analysis revealed a

main effect of Attitude Type, $F(2.59, 191.84)=221.42$, $p<.001$, $\eta_p^2=.75$.[12] We examined differences among attitude report types using Bonferroni-corrected pairwise comparisons. Because a total of six comparisons were possible, uncorrected *p* values (reported here and in all subsequent analyses) needed to be .008 or lower to remain significant. Participants were more likely to select a form of the word "believe" when responding to religious items than to any of the factual items (*p*s<.001, Cohen's *d*s≥1.77). Participants were also more likely to select a form of the word "believe" when responding to well-known factual items than factual items about everyday life ($p<.001$, Cohen's $d=.53$) and when responding to esoteric items rather than items about everyday life ($p=.002$, Cohen's $d=.36$). Responses to well-known and esoteric factual items did not differ ($p=.117$, Cohen's $d=.18$; Fig. 1). Several analyses investigated whether these results differed depending on religion-based demographic variables; however, consistent differences did not emerge. See Supplemental Materials for these results for Studies 2-4.

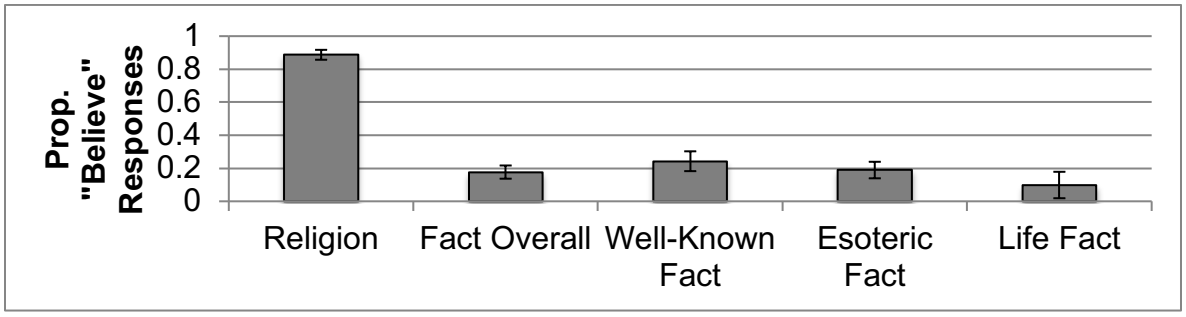

Fig. 1. Proportion of trials on which participants selected a form of the word "believe," Study 2. Error bars represent 95% confidence intervals.

Study 2 was broadly consistent with Study 1. Most importantly, participants were more likely to use a form of the word "believe" in religious contexts and a form of the word "think" in factual contexts. The difference between religious items and factual items was far larger than the

[12] All non-integer degrees of freedom reflect a Greenhouse-Geisser adjustment to correct for a violation of the assumption of sphericity.

differences among factual items. Nevertheless, to the extent that differences did emerge among factual items, they did not support alternative explanations for the difference between religious and factual attitude reports. If participants used "believe" in conjunction with statements that are not widely accepted or statements whose truth is unknown, they should have been less likely to use this word in conjunction with well-known facts than with either of the other fact types. Results from Study 2 revealed the opposite pattern, suggesting that the difference between religious items and factual items as a whole could not be explained by these factors.

Study 3: Attitude Report Contexts (Free Response)

Although Study 2 supported the hypothesis that participants would use the word "believe" more often in religious contexts and the word "think" more often in factual contexts, one might worry that this pattern was driven by the fact that the paradigm was forced choice. If given the option, participants may choose neither "believe" nor "think," but some entirely other verb, to complete these sentences. To address this concern, Study 3 deployed the same set of stimuli using a free-response paradigm.

Method

Participants. The sample included 80 adults who were recruited via Amazon Mechanical Turk and received $1.50. Forty-one percent of participants indicated that they were female and 56% indicated that they were male; the remaining participants did not answer this question. Participants also self-identified as White or European-American (80%), Black or African-American (6%), Asian or Asian-American (11%), Hispanic or Latino/a (1%), and Multiracial (1%); the remaining participants did not answer this question. Participants self-identified as Protestant (23%), Catholic (9%), Christian: Other (9%), Jewish (3%), Muslim (1%), Hindu (1%), Buddhist (1%), Pagan (3%), None (46%), and Other (4%); one additional participant did not

respond to this item. When asked about their attitude toward God, 40% selected the option "God exists," 18% selected "God does not exist," 19% selected "we cannot know whether God exists," 18% selected "a higher power exists but we don't know what it's like," and 5% selected "Other." On average, participants indicated that this attitude was moderately important to them (M=3.94, SD=2.39) and that they were moderately certain in it (M=5.23, SD=2.12). They also reported attending services "a few times a year" on average (M=1.67, SD=1.12).

Procedure. The procedure was identical to Study 2 with one exception: rather than completing sentences using drop-down menus containing forms of "think" and "believe," participants typed any word that they thought made the most sense of the sentence as a whole.

Results and Discussion

Each response was coded in two ways. First, participants received a 1 if they used a form of "believe" and a 0 if they used a form of any other word, including "think" as well as non-target words (e.g., know, say, learn). To determine whether the patterns from Study 2 would emerge when participants could complete the sentences using any words they wished, we analyzed the proportion of "believe" responses using the same analyses as in Study 2. As in that earlier study, a paired-samples t-test showed that participants were more likely to use a form of the word "believe" when responding to religious items (M=.51, SD=.29) than factual items (M=.08, SD=.18, $t(79)=14.01$, $p<.001$, Cohen's d=1.59).

To examine finer-grained differences among religious attitude reports and the three different types of factual belief reports, we conducted a one-factor, four-level (Attitude Type: religion vs. well-known fact vs. esoteric fact vs. life fact) repeated-measures ANOVA. This analysis revealed a main effect of Attitude Type, $F(1.65, 130.33)=148.98$, $p<.001$, $\eta_p^2=.65$. We examined differences among attitude report types using Bonferroni-corrected pairwise

comparisons. Because a total of six comparisons were possible, *p* values needed to be .008 or lower to remain significant. Participants were more likely to select a form of the word "believe" when responding to religious items than to any of the factual items (*p*s<.001, Cohen's *d*s≥1.44). Participants were also more likely to select a form of the word "believe" when responding to esoteric factual items than factual items about everyday life (*p*=.003, Cohen's *d*=.35). No other comparisons reached significance (*p*s≥.012, Cohen's *d*s≤.29; Fig. 2).

As in Study 2, participants were more likely to use a form of "believe" when responding to religious items than to any of the factual items. Differences among the factual items varied across the two studies and should be interpreted with caution. However, in no case were participants more likely to use "think" in conjunction with well-known facts versus other factual statements, providing additional support for the idea that the difference between religious attitude reports and factual attitude reports overall is not due to the fact that religious propositions are less widely accepted or the fact that participants may have been uncertain as to whether the religious propositions were true.

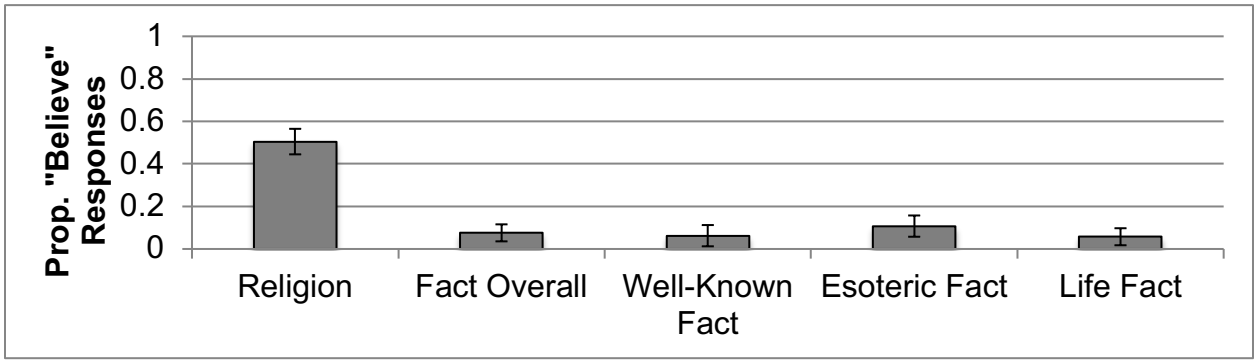

Fig. 2. Proportion of trials on which participants responded using a form of the word "believe," Study 3. Error bars represent 95% confidence intervals.

Second, participants received a 1 if they used any word other than a form of "think" or "believe" and a 0 if they used any form of these two target words. To determine whether

participants differed in the extent to which they used non-target words across categories, we analyzed the proportion of non-target responses using the same analyses as above. A paired-samples *t*-test showed that participants were more likely to use non-target words when responding to factual items (M=.77, SD=.03) than religious items (M=.34, SD=.27, $t(79)$=14.92, p<.001, Cohen's d=1.64).

To examine finer-grained differences among religious attitude reports and the three different types of factual attitude reports, we conducted a one-factor, four-level (Attitude Report Type: religion vs. well-known fact vs. esoteric fact vs. life fact) repeated-measures ANOVA. This analysis revealed a main effect of Attitude Type, $F(3, 237)=103.55$, p<.001, η_p^2=.57. We examined differences among attitude report types using Bonferroni-corrected pairwise comparisons. Because a total of six comparisons were possible, p values needed to be .008 or lower to remain significant. Participants were *more* likely to use a word other than a form of "think" or "believe" when responding to well-known factual items than any other items (ps<.001, Cohen's ds≥.43) and *less* likely to use a word other than the two target words when responding to religious items than to any other items (ps<.001, Cohen's ds≤-1.19). Participants were equally likely to use non-target words when responding to esoteric factual items and factual items about everyday life (p=.280, Cohen's d=.12; Fig. 3). Participants may have assumed that a wider range of cognitive attitudes was likely to be held toward propositions of a factual nature than toward propositions of a religious nature, although more work on this issue is needed.[13]

[13] Although we did not have *a priori* hypotheses about the use of any non-target words, we became curious about how often participants used a form of the word "know." Participants used a form of this verb for 5% of the religious items, 48% of the well-known fact items, 16% of the esoteric fact items, and 20% of the life fact items (28% of all fact items combined). The differences among all of these proportions reached statistical significance, with the exception of participants' propensity to use a form of the word "know" in response to esoteric fact items versus life fact items. Future work can further probe laypeople's use of the word "know."

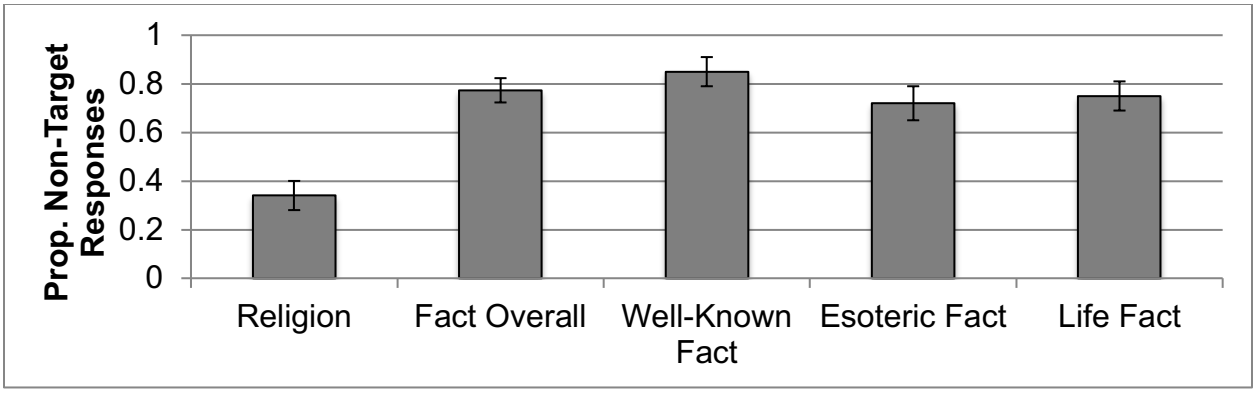

Fig. 3. Proportion of trials on which participants responded using words other than any form of the words "think" or "believe," Study 3. Error bars represent 95% confidence intervals.

Study 3 sought to determine whether participants would use the word "believe" more in conjunction with religious rather than factual attitude reports even when they were free to select any word that fit grammatically, including non-target words such as "say" or "know." This study supported Study 1 and replicated Study 2, showing that participants were more likely to use "believe" in conjunction with religious items and "think" in conjunction with factual items.

Study 4: Vignettes and Attitudes

The data from Studies 1-3 support the hypothesis that speakers of American English use "believe" in conjunction with religious attitude reports and "think" in conjunction with factual belief reports. One might still wonder, however, whether this difference in uses of "think" and "believe" really refers to qualitatively distinct *cognitive attitudes* (such as *factual belief* and *religious credence*) or whether these uses instead refer to a difference that can be explained entirely by appeal to the *contents* of the reported attitudes. The Varieties of Belief Thesis suggests that different cognitive attitude types are being reported; this is our view. However, a person who holds the Single Belief Thesis is likely to say that "think" and "believe" in fact designate the *same* underlying cognitive attitude, but laypeople are more likely to use "think" when referring to an instance of *that attitude* that has more matter-of-fact contents and "believe"

when referring to an instance of *that attitude* that has religious contents. In saying this, someone who holds the Single Belief Thesis would be insisting, as expected, that there is just one attitude to be talked about as "belief." To address this possibility, Study 4 held the contents of reported mental states constant while using factual or religious vignettes to introduce variation in the attitudes that participants would attribute to characters in relation to those contents. We hypothesized that speakers of American English would be more likely to use "believe" for religious cognitive attitude reports and "think" for factual cognitive attitude reports, *even when the contents of the reported attitudes were identical*. Since Studies 2-3 found the same pattern of use of "think" and "believe" for both forced choice and free response, we did not run a free-response version of the vignettes study. Also, since responses to all three types of factual contexts differed in the same way from responses to religious contexts in Studies 2-3, we combined factual contexts into one general type for Study 4.

Method

Participants. The sample included 69 adults who were recruited via Amazon Mechanical Turk and received $1.50. Data from nine additional individuals were excluded because they failed to provide a correct answer to the attention check question (n=3; as in both previous studies, this item asked participants to recall any one of the experimental items), because they had immigrated to the United States and may therefore have been unfamiliar with the nuances of American English (n=2), or because they had completed one of the earlier studies reported in this paper (n=4). Forty-nine percent of participants indicated that they were female and 51% indicated that they were male. Due to experimenter error, Study 4 did not ask questions about racial background. Participants self-identified as Protestant (23%), Catholic (16%), Christian: Other (10%), Jewish (1%), Muslim (1%), Buddhist (1%), None (45%), and Other (1%). When

asked about their attitude toward God, 42% selected the option "God exists," 20% selected "God does not exist," 26% selected "we cannot know whether God exists," and 10% selected "a higher power exists but we don't know what it's like"; one additional participant did not answer this question. On average, participants indicated that this attitude was moderately important to them (M=4.19, SD=2.51) and that they were moderately certain in it (M=5.36, SD=2.13). They also reported attending services "a few times a year" on average (M=1.73, SD=1.16).

Procedure. Participants received the same instructions as in Study 2. However, factual or religious vignettes preceded the blanks that participants were to complete in attributing mental states to the subjects of the vignettes. Each factual vignette corresponded to a religious vignette with a parallel structure. For any given vignette pair, the *that* clauses following the fill-in-the-blanks were identical for religious and factual contexts. For example, the religious condition included the following vignette: "All last year, Terry would get splitting headaches in the afternoons. Sometimes her friends would offer her aspirin. But Terry belonged to the Church of Christ Scientist, which teaches that prayer, not medicine, is the way to cure medical ills. So Terry always refused the aspirin her friends offered, because she _____ that aspirin was not a cure." The matching factual vignette read as follows: "All last year, Kerry would get splitting headaches in the afternoons. Sometimes her friends would offer her aspirin. But Kerry had tried using aspirin many times in the past, and the headaches just kept happening, whether she took aspirin or not. So Kerry always refused the aspirin her friends offered, because she_____ that aspirin was not a cure." Thus, within a vignette pair, the contents of the attributed cognitive attitude were identical (e.g., *that aspirin is not a cure*). Each participant answered ten religious vignettes and ten factual vignettes, for a total of 20 items (for all vignettes, see Supplemental Materials). As in Study 2, the order of response options (whether the first word in the drop-down

menu was a form of "think" or "believe") was counterbalanced across items, and the order in which vignettes appeared was randomized across participants.

Results and Discussion

For each experimental item, responses were coded as 1 if participants selected some form the word "believe" and 0 if participants selected some form of the word "think." We used a paired-samples *t*-test to compare the proportion of trials on which participants selected "believe" when responding to items in these two conditions. Confirming our hypothesis, participants were more likely to select "believe" when responding to religious items (M=.74, SD=.20) than factual items (M=.38, SD=.20, $t(68)$=9.08, p<.001, Cohen's d=1.13).

Because the *that* clauses in the religious and factual attitude reports in Study 4 were identical, it is not possible that differences in the content of reported attitudes created the observed difference between conditions. Thus, Study 4 provides additional evidence that participants distinguish religious cognitive attitudes from factual cognitive attitudes, even when the contents of the reported attitudes do not differ.[14]

General Discussion

We used approaches from philosophy, psychology, and the cognitive science of religion to investigate laypeople's understanding of religious and factual cognitive attitudes. Study 1 analyzed linguistic corpora and found that forms of the word "believe" were paired with religious attitude reports to a greater extent than forms of "think." Using corpora allowed us to

[14] In addition to the studies reported here, we conducted a fifth study to test whether religious credences were uniquely associated with use of the word "believe." We found that participants were more likely to use the word "believe" in conjunction with religious credences than with political convictions, and they were more likely to use "believe" in conjunction with political convictions than with factual beliefs. See Supplemental Materials for more details on this study.

examine naturally occurring language but did not allow us to control the sentences. Therefore, we conducted Studies 2-4 to rule out potential low-level explanations for Study 1's findings.

These studies showed that participants used "think" more in conjunction with factual attitude reports and "believe" more in conjunction with religious attitude reports when they were forced to choose between one of these two words (Studies 2 and 4) and when they were free to select any word (Study 3). Differences among well-known, esoteric, and life factual attitude reports were not consistent across studies and should be replicated before being interpreted; however, in no case did these differences suggest that individuals were more likely to use "think" for items that elicited consensus or for items that participants knew to be clearly true or false (or thought likely to be true or false). Thus, the difference between religious and factual items does not appear to depend on those features. Furthermore, the difference between religious and factual attitude reports emerged even when the rest of the words (the *that* clauses in the attitude reports) were identical (Study 4), suggesting that this pattern is based on judgments about religious versus factual attitudes rather than about linguistic features at the sentence level, such as grammar and syntax. Since the *that* clauses that completed the attitude reports in Study 4 were identical across religious and factual contexts, it is also fair to infer that the distinct patterns of use for "thinks" and "believes" reflect judgments about differences between religious and factual *attitude types*, as opposed to just religious vs. factual *contents*. This, in our view, is an important consideration that favors the Varieties of Belief Thesis over the Single Belief Thesis; see section on the Single Belief Thesis below.

These findings make an important contribution to the psychology of religion by showing that, in the minds of laypeople, religious mental states are not of the same type as other mental states, such as factual beliefs. This claim may appear counterintuitive; from observing daily

social behaviors, it may appear that religious individuals describe their religion with utter certainty. An observer of a religious service may conclude that worshippers do indeed "believe" that Jesus rose from the dead in exactly the same way they "believe" that they too will die someday. Nevertheless, the current work demonstrates that individuals—even religious individuals—distinguish religious and factual cognitive attitudes. (See Supplemental Materials for analyses showing that religious demographics were not associated with dependent measures.)

Support for the Varieties of Belief Thesis

The current results provide more support for the Varieties of Belief Thesis than for an alternate view, the Single Belief Thesis, which denies that there is a distinction between the attitudes expressed by factual attitude reports and those expressed by religious "belief" reports (e.g., Boudry & Coyne, 2016a, 2016b; Harris et al., 2009; Levy, 2017). According to the Single Belief Thesis, contents may vary, but there is only one attitude. In contrast, the current work suggests that laypeople may view religious and factual statements as reflecting distinct attitudes.

The present findings fit with other work highlighting distinctions between religious and factual cognitive attitudes. Factual beliefs have strong rationality constraints (Sperber, 1982/1985) and are vulnerable to evidence (Van Leeuwen, 2014), whereas religious credences—and, to some extent, other convictions as well—may be processed more like imaginings that make strong normative demands on religious agents (Luhrmann, 2012; Van Leeuwen, 2014, 2017). Furthermore, religious credences are likely to be processed as central to a person's identity in a way that factual beliefs are not (see Ysseldyk, Matheson, & Anisman, 2010), which may help explain why religious credences are associated with strong emotions (Keltner & Haidt, 2003; Van Cappellen, 2017) and respond to authority figures differently than do factual beliefs (Saraglou, Corneille, & Van Cappellen, 2009). Another difference between religious credence

and factual belief appears to be in the extent to which they are subject to voluntary control: religious credence seems to be controlled by volition (one *chooses* to "believe" that Jesus is Lord and Savior), but ordinary factual belief does not seem to be voluntary (one "thinks" that the sun is hot and has little or no volitional latitude to convince oneself otherwise). Given these large differences, it is no surprise that laypeople have patterns of word choice that track the difference, using "thinks" more for factual beliefs and "believe" more for religious credence.

This perspective has the additional advantage of cohering with the historical research of Wilfred Cantwell Smith (1977/1998) on the word "belief" and cognates. According to Cantwell Smith, the meaning of "believe" at the time of the King James Bible was approximately "to hold dear," which is very different from the ordinary, matter-of-fact attitude by which humans track mundane events in the world. The present research suggests that "believe" retains something of this earlier, more personal sense and hence is used to refer to cognitive attitudes of a more identity-defining sort than ordinary factual beliefs.

The differences in attitude type just listed can also help explain why laypeople perceive disagreements about these types of "belief" in different ways. Prior work found that 5- to 10-year-old children were more likely to report that only one person could be right in a disagreement about factual claims than they were to report that only one person could be right in a disagreement about religious credences (Heiphetz et al., 2013). This difference may emerge because individuals perceive that these claims provide different information; factual claims are perceived to provide more information about external reality than about the speaker's internal reality, whereas religious claims are perceived to provide a moderate amount of information about both the world and the speaker (Heiphetz et al., 2014). In other words, if what one "believes"—to use Cantwell Smith's formulation—is what one *holds dear*, then it is no surprise

that the mental states referred to with "believe" are regarded as more laden with information about a person's internal world that is less easily subject to objective debate and resolution.

One complexity regarding the Varieties of Belief Thesis is that "thinks" and "believes" are flexible enough to refer to a range of mental states. Mental state terms tend to be *polysemous*—that is, each term has a class of related meanings rather than just one specific one—so there is a fair bit of overlap among the sets of linguistic contexts for which each term ("believe" or "think") is appropriate (Goddard, 2010). But the difference we found in how "believes" and "thinks" are likely to be used coheres with the Varieties of Belief thesis; there is a difference in attitude to which speakers are sensitive. Our present studies considered only American English, but we suspect parallel patterns will exist in other languages and dialects as well.[15]

There is much more work to be done in identifying the dimensions of variation that separate religious credence from factual belief, but the present research is an important step toward making that investigation empirical. In contrast to prior work supporting the Varieties of Belief Thesis, the current work united philosophical and psychological methods to examine how representations of multiple cognitive attitudes emerge in laypeople's language. This can be considered a more subtle measure than many employed in prior work and thus provides a tougher test of the Varieties of Belief Thesis. When people are explicitly asked whether two people can be right in a disagreement (Heiphetz et al., 2013) or how much they have learned about the world versus the person making the statement (Heiphetz et al., 2014), they may be

[15] For example: "denken" vs. "glauben" (German); "penser" vs. "croire" (French); "pensar" vs. "creer" (Spanish); "düşünmek" vs. "inanmak" (Turkish); "chashav" vs. "he'amin" (Hebrew); "luulla" vs. "uskoa" (Finnish); "cabanga" vs. "kholwa" (Zulu); etc. These examples are just a few of many. Importantly, the pattern of difference appears in unrelated language families (Indo-European, Semitic, etc.).

unable to report their true representations of religious versus factual attitudes (Nisbett & Wilson, 1977). If participants do not spend much time considering possible differences between various types of statements in their everyday lives, it is also possible that their responses in experimental settings over-estimate the extent to which differences between religious and factual attitudes (and perhaps other convictions) are salient in daily life. The current work addressed these concerns by measuring language use rather than requiring participants to explicitly report on their cognition. Indeed, Study 1 analyzed language use that occurred outside of experimental settings, and Study 3 permitted participants to complete sentences in whatever ways they wished, therefore mimicking everyday life more closely than prior studies supporting the Varieties of Belief Thesis.

In addition to studying the psychological differences between religious credence and factual belief, future research along the present lines can investigate the origins of the linguistic differences found in the current work. That is, how did the words "think" and "believe" become associated with different types of mental states? Does this outcome reflect explicit teaching or a more implicit form of learning? Future work can also directly investigate the generalizability of the claims made here to non-English languages. Numerous languages use different word for "think" versus "believe" (see Footnote 15), and future work can test the Varieties of Belief Thesis empirically in non-English speaking cultures.

Conclusions

The current work investigated the extent to which people speak differently about religious versus factual cognitive attitudes. Using evidence from a linguistic corpus and from psychological experiments, we demonstrated that individuals are more likely to use the word "think" in conjunction with factual attitude reports and the word "believe" in conjunction with

religious attitude reports. These data provide support for the Varieties of Belief Thesis, which distinguishes religious credence from factual belief. These results also point to the importance of understanding varieties of cognitive attitudes in explaining human cognition more broadly.

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