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The Puzzle of Belief

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Abstract

The notion of belief appears frequently in cognitive science. Yet it has resisted definition of the sort that could clarify inquiry. How then might a cognitive science of belief proceed? Here we propose a form of pluralism about believing. According to this view, there are importantly different ways to "believe" an idea. These distinct psychological kinds occur within a multi-dimensional property space, with different property clusters within that space constituting distinct varieties of believing. We propose that discovering such property clusters is empirically tractable, and that this approach can help sidestep merely verbal disputes about what constitutes "belief."

Keywords: Belief; Attitudes; Epistemology

Cognitive scientists often appeal to *beliefs* to explain reasoning and behavior. Psychologists talk of belief bias, belief polarization, and belief attributions (which are themselves beliefs *about* beliefs). Neuroscientists look for beliefs in the brain. Education researchers appeal to misconceptions: beliefs with false contents. Anthropologists study religious beliefs. On the formal side, artificial intelligence researchers investigate the logic of belief revision, while logicians model belief contents using possible worlds. Yet despite its widespread use, the notion of belief itself has resisted definition.

Hence, our puzzle is this: *What is belief?* Or, as we reformulate the question: *What is believing, and are there different kinds?*

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In the philosophical literature on belief, consensus on basic issues has not been achieved. Are beliefs a particular kind of mental state or representation? Are they under voluntary control? Are they constrained by evidence? Do beliefs come in degrees? Each question is unresolved (Schwitzgebel, 2021).

The problem seems to be this: For any property one might take to define belief, there are apparent examples of "belief" that lack that property. Many philosophers, for example, hold that believing is involuntary (one cannot just decide to believe it is Tuesday), but ethnographies of religion appear to showcase people who adopt religious beliefs by *choice*. Pick a property to help define "belief," and a motley crew of delusions, ideological beliefs, religious beliefs, and so forth, wreaks havoc on your definition.

Can we do away with "beliefs" in favor of subjective probabilities or expectations? That pushes the problem down the road. Notions like "subjective probability" similarly defy definition (Eriksson & Hájek, 2007). Moreover, much philosophical literature on belief argues that some beliefs come in degrees (subjective probability), while others are "flat out," meaning they cannot reduce to subjective probabilities (Buchak, 2014; Ross & Schroeder, 2014). Finally, many religious and ideological beliefs, while central to people's identities, are *not* high in subjective probability (Van Leeuwen, 2022; see also Cusimano & Lombrozo, in press).

Another response to the problems that arise for belief is to retreat to *eliminativism* (or its milder cousin *instrumentalism*). On this approach, "belief" might be useful folk-theoretic talk, but it does not belong in mature cognitive science: It should be replaced by appeals to systems that have been more successfully characterized to date (memory systems, perceptual systems, intuitive theories, etc.).

The idea here is that there is no scientific need to posit beliefs about, say, first-hand experience (of the form: *S believes such-and-such happened*), since one can posit *memories* instead (e.g., *S remembers such-and-such happened*). Similarly, there is no need to posit perceptual beliefs (of the form: *S believes such-and-such about the proximal environment*) since one can posit percepts instead (e.g., *S perceives such-and-such*). Thus, more and more portions of "belief" get replaced by more rigorous concepts. Eventually, no "belief" residue remains.

Yet belief cannot be done away with so easily. One underappreciated reason for this is as follows: For any of the representational systems considered above (and many others as well), its outputs can be *believed or not*. So belief, if it occurs, occurs *in addition* to the representations of that system.

Consider again memory. Many people experience remembering things they believe did not actually happen (Scoboria et al., 2014). Typically, of course, one believes what one remembers. But since believing can attend a given memory state *or not*, the believing part cannot be ontologically reduced to the memory state itself. The same can be said for perception. People mostly believe what they perceive, but not always. We sometimes do *not* believe our percepts, as happens when we experience a known illusion: One perceives the lines in the Müller-Lyer illusion as differing in length but believes they are the same. So believing is a cognitive component beyond the percept—one that cannot be reduced to it. A similar logic applies to the outputs of intuitive systems and beyond (e.g., McGahhey & Van Leeuwen, 2018).

In sum, cognitive scientists have compelling reasons to invoke belief, yet lack a clear account of it and cannot replace it with more respectable alternatives. What is the way forward?

First, let us set aside some unhelpful ways of thinking. Theorists often speak of beliefs as though each were a discrete possession (Abelson, 1986) or entity in the mind: one in the "belief box" for each belief that can be attributed to a person. But such metaphors are misleading, since they encourage us to look for "beliefs" as though they were entities that existed independently from the other representational structures in the mind/brain. In fact, to believe an idea is to process the relevant representations in certain ways—where the representations in question could be products of any of a variety of cognitive systems, as we just saw in connection with memory and perception. We think an antidote to the misguided tendencies that arise from such metaphors is to state the main question in somewhat different terms: Instead of asking "What is it to have a belief?" one can ask "What is it to believe an idea?" Though there is nothing in principle wrong with the first question, it runs the risk of reification; the latter formulation puts a stronger emphasis on the *attitude* or *manner of processing* that goes into believing ideas—wherever those ideas arise.

Second, there is no guarantee that believing will be one thing. The history of cognitive science is replete with cases where finer-grained distinctions led to better science: different memory systems, different learning systems, and more. Quite possibly, there is no single way to believe, and the distinctions we see in natural language (between thinking, believing, supposing, endorsing, and more) are but a glimpse into the different ways people relate (in belief-like ways) to ways the world could be (e.g., Van Leeuwen, 2014, forthcoming). So it might be most fruitful to investigate the *varieties* of believing, not just a single way to believe.

Importantly, when we suggest that there are different varieties of believing, we are proposing a distinction that is orthogonal to more familiar distinctions, such as implicit versus explicit or intuitive versus reflective (e.g., Sperber, 1997; see also Musolino et al., 2022). Even among "beliefs" that are both explicit and reflective, for example, those that are more ideological may be *processed* quite differently from those that are more matter-of-fact; hence, they may involve distinct cognitive attitudes, despite both falling under our pre-theoretical use of the term "belief."

We find it likely, in fact, that lack of consensus on what defines belief stems partly from a misplaced expectation that believing should be a single psychological kind. It could be that one sort of believing is voluntary, while another is not; one sort is constrained by evidence, while another is not; one sort is context invariant, while another is context dependent; and so on. Adopting this stance does not amount to throwing up one's hands. It amounts to recognizing a multi-dimensional property space within which different varieties of believing—along with other cognitive attitudes—can be characterized, and the interesting natural kinds will be the clusters (and clusters of clusters) that emerge in that property space through empirical investigation.

What might these clusters look like? We predict that they will align with different functions or aims that the beliefs serve (e.g., Davoodi & Lombrozo, 2022). Most beliefs serve the important epistemic function of tracking the likely state of the world, but others serve interpersonal functions, such as generating signals of group membership (De Cruz, 2020; Kahan,

2015), and intrapersonal functions, such as finding a sense of peace (Luhrmann, 2020). Such functions may constrain the causes and consequences of different flavors of believing, generating property clusters in the multi-dimensional space of cognitive attitudes. One may quibble over which clusters do or do not deserve the name "belief," but the more important scientific questions are what the clusters are, what they explain, and how they are distinct from one another.

The traditional philosophical questions can thus be recast. Instead of asking "Is believing voluntary or not?," we should ask, "What *other* properties does 'believing' have (or lack) when it is of the voluntary sort?" "What distinct functions do voluntary 'beliefs' serve, and how does voluntariness contribute to those functions?" More generally, we hold that looking for systematic relations among co-occurring properties is the way to zero in on useful psychological kinds, including kinds of belief. These latter questions are more complicated, but they have the virtue of not devolving into merely verbal disputes (Chalmers, 2011). They are also questions that many cognitive scientists are currently well placed to explore.

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References

Abelson, R. P. (1986). Beliefs are like possessions. *Journal for the Theory of Social Behaviour*, *16*(3), 223–250.

Buchak, L. (2014). Belief, credence, and norms. *Philosophical Studies*, *169*(2), 1–27.

Chalmers, D. (2011). Verbal disputes. *Philosophical Review*, *120*(4), 515–566.

Cusimano, C., & Lombrozo, T. (in press). People recognize and condone their own morally motivated reasoning. *Cognition*.

Davoodi, T., & Lombrozo, T. (2022). Explaining the existential: Scientific and religious explanations play different functional roles. *Journal of Experimental Psychology: General*, *151*(5), 1199.

De Cruz, H. (2020). Believing to belong: Addressing the novice-expert problem in polarized scientific communication. *Social Epistemology*, *34*(5), 440–452.

Eriksson, L., & Hájek, A. (2007). What are degrees of belief? *Studia Logica*, *86*(2), 185–215.

Kahan, D. M. (2015). Climate-science communication and the *measurement problem*. *Political Psychology*, *36*, 1–43.

Luhrmann, T. M. (2020). *How God Becomes Real: Kindling the Presence of Invisible Others*. Princeton, NJ: Princeton University Press.

McGahhey, M., & Van Leeuwen, N. (2018). Interpreting intuitions. In J. Kirsch & P. Pedrini (Eds.), *Third-Person Self-Knowledge, Self-Interpretation, and Narrative* (pp. 73–98). Cham, Switzerland: Springer Verlag.

Musolino, J., & Sommer, J., & Hemmer, P. (2022). *The Cognitive Science of Belief: A Multidisciplinary Approach*. Cambridge, UK: Cambridge University Press.

Ross, J., & Schroeder, M. (2014). Belief, credence, and pragmatic encroachment. *Philosophy and Phenomenological Research*, *88*(2), 259–288.

Scoboria, A., Jackson, D. L., Talarico, J., Hanczakowski, M., Wysman, L., & Mazzoni, G. (2014). The role of belief in occurrence within autobiographical memory. *Journal of Experimental Psychology: General*, *143*(3), 1242.

Schwitzgebel, E. (2021). Belief. In E. N. Zalta (Ed.) *The Stanford Encyclopedia of Philosophy* (Winter 2021 ed.). Available at: https://plato.stanford.edu/archives/win2021/entries/belief/

Sperber, D. (1997). Intuitive and reflective beliefs. *Mind & Language*, *12*(1), 67–83.

Van Leeuwen, N. (2014). Religious credence is not factual belief. *Cognition*, *133*(3), 698–715.

Van Leeuwen, N. (2022). Two concepts of belief strength: Epistemic confidence and identity centrality. *Frontiers in Psychology*, *13*, 939949.

Van Leeuwen, N. (forthcoming). *Religion as Make-Believe: A Theory of Belief, Imagination, and Group Identity*. Cambridge, MA: Harvard University Press.