Belief, Credence, and Graspability: Why Credences are not Beliefs

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Abstract: A question of recent interest in epistemology and philosophy of mind is how belief and credence relate to each other. Easwaran (2013), Holton (2014), and Moon (2018), among others, argue for a belief-first view of the relationship between belief and credence. On the belief-first view, what it is to have a credence just is to have a particular kind of belief, that is, a belief whose content involves a probability judgment or epistemic modal. Here, I argue against the belief-first view: specifically, I argue that it cannot account for agents who have credences in propositions they barely comprehend. I conclude that, however credences differ from beliefs, they do not differ in virtue of adding additional content to the believed proposition.

Keywords: Belief, Credence, Belief-first, Graspability

I. Introduction

I believe many things. I believe it will rain tomorrow, that 1+1=2, and that I was born in September. I also withhold belief in certain propositions: that a fair coin will land heads, or that there is an even number of stars. I also disbelieve propositions: that it is 75 degrees and sunny in Antarctica or that 1+1=3. Most epistemologists think these are the three belief-like attitudes one can take toward a proposition: belief, withholding, and disbelief.

At the same time, I’m more confident in some of my beliefs than in others. For instance, I believe that it will rain tomorrow and that 1+1=2, but I’m more confident in the latter than in the former. For this reason, many epistemologists appeal to a second attitude, called credence, similar to a level of confidence. (I will use ‘credence’ and ‘confidence’ interchangeably). Credences are often given a value on the [0,1] interval, where 1 represents maximal confidence some proposition is true, and 0 represents maximal confidence it is false. So, I might have a credence of 1 that 1+1=2, a credence of 0.9 it will rain tomorrow (if the forecast predicts a 90% chance of rain) a credence of 0.5 that a fair coin will land heads, and a credence of 0 that 1+1=3.

Assuming we have both beliefs and credences, a natural question arises: how do they relate to each other? Do either belief or credence reduce to the other? There are three main answers to this question. On the credence-first view, belief reduces to a feature of credence. Common versions of the credence-first view maintain that belief is credence above some threshold, or that belief is maximal credence. On the dualist view, neither belief nor credence reduces to the other, but the attitudes are equally fundamental and each has a unique role to play.

The focus on this paper is a third view, the belief-first view, that reduces credence to belief. Early on, this view was taken to be one on which credences were beliefs about probabilities, so my 0.9 credence it will rain tomorrow is a belief with the content the probability it will rain tomorrow is 0.9. More recently, belief-firsters have claimed that credences are beliefs whose content is about not just probability, but epistemic modals more generally. For instance, a high credence that it will rain

1 Some eliminativists deny that we have both attitudes, see e.g. Jeffrey (1970), Churchland (1981), Maher (1993: 152-155).
6 See Moon (2017, 2018), Sturgeon (forthcoming), [removed for blind review].
tomorrow is the belief *it will probably rain tomorrow*, where ‘probably’ picks out an epistemic modal. Credences can involve other epistemic modals, like ‘definitely,’ and ‘might.’ Here is a version of that view:

**Belief-first:** For S to have a credence of n in p just is for S to believe (Mp), where M is an epistemic modal and M and n correspond to each other.7

Of course, this is only one possible belief-first view, but I focus on this view because it has several advantages. First, it answers David Christensen’s (2004: 18) challenge to belief-first: if credences are probability-beliefs, what is the interpretation of probability involved in the content of these beliefs? It answers: *epistemic probability*, which picks out a relation between one’s credences and one’s evidence.8

Epistemic probability is more plausible than the answers Christensen considers, e.g. the subjective and the frequency interpretations of probability.9 Further, on this belief-first view, credences can be precise—when one forms an explicit belief about the probability of some proposition, e.g. believing *the probability the coin will land heads is 0.5*. But they can also be imprecise—when one’s credence involves an epistemic modal that doesn’t make a precise probability judgment, e.g. *it might rain tomorrow*.

Besides Christensen’s challenge, the primary objection raised to belief-first views is the oversophistication objection. This objection states that some agents, like young children and animals, can have credences without forming the corresponding modal beliefs. This is because they don’t have the relevant concept (e.g. probability or various other epistemic modals). Since these agents have a credence in p without a belief that Mp, credences aren’t modal beliefs.10 Some belief-firsters have replied to this objection, but the verdict is still out on whether it is decisive.11

In this paper, I present a new objection to the belief-first view. My argument involves a proposition, p, on the edge of an agent’s comprehension, such that she can grasp p, but cannot grasp a proposition more complex than p. The objection I present here is a problem for any belief-first view that reduces a credence in p to a belief that (Xp). It doesn’t matter what X is—it could be probability, likelihood, epistemic modals, or some other numerical component—as long as it adds content to the believed proposition.12 Call any belief-first view that reduces a credence in p to belief in some content that is more complex than p a *content-enhancing* belief-first view. While I will proceed utilizing the epistemic-modal view above, my objection applies to any content-enhancing view, which is almost every belief-first view in the literature.13

This paper is structured as follows. In **Section II**, I explain and defend my argument, showing how it counts against the belief-first view. In **Section III**, I consider and reply to some objections. I conclude in **Section IV**. Before I begin, I will clarify the notion of grasping with which this paper is concerned.

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7 [Removed for blind review].
8 Sturgeon (forthcoming), [removed for blind review].
11 For replies to the oversophistication objection, see [removed for blind review].
12 Sarah Moss (2018) has a view of credences she calls a “simple attitude, complex content” view, so my argument may be a problem for her view as well. At the same time, Moss denies that beliefs and credences are propositional attitudes, so it is less clear if the arguments in this paper would apply to her view; this partially hangs on the question of what is required of an agent mentally and phenomenally in order to have a belief that has non-propositional content.
13 One possible exception is Kauss (forthcoming).
To explain what I mean by ‘grasping’ or ‘graspability’, we should examine the way the term is used in other philosophical literature. ‘Grasping’ comes up frequently in the epistemology of understanding literature. Consider an example from David Bourget (2017: 285-6):

“Jane had been smoking for over fifteen years. Thanks to the government’s aggressive information campaign, she was fully informed about the dangers of smoking, but this never compelled her to quit. One day, a colleague of hers who was also a smoker was diagnosed with lung cancer. Learning about her colleague’s condition helped Jane grasp the dangers of smoking and made her quit for good.”

In this case, Jane initially does not grasp the dangers of smoking in the sense that Jane doesn’t fully appreciate (and act upon) her beliefs that smoking is dangerous. When her colleague is diagnosed with cancer, she ‘grasps’ the dangers of smoking in a new way, but arguably, this does not involve forming any new beliefs. Several have argued that, instead, what has changed is that Jane now understands the danger of smoking. This sense of grasping is often used to distinguish believing p or knowing p from understanding p.\(^\text{14}\)

This is not the sense of grasping I’m concerned with. In this paper, I’m interested in a much thinner sense of grasping: namely, the minimal ability to comprehend a proposition, such that one can form a belief (or other propositional attitude) with the proposition as its content. (Of course, what is graspable is likely agent-relative).\(^\text{15}\) This is the sense of graspability that often comes up in the literature on epistemic justification, specifically in discussions of internalism’s strong awareness condition and infinitism.\(^\text{16}\) For the purposes of this paper, I will use the terms grasp/grasping/graspability to refer to this weaker sense of grasping, associated with the minimal comprehensibility of a proposition.\(^\text{17}\)

II. The Argument

Sally’s two friends, Sarah and Billy, are fighting. Sally is telling her mom about this fight, and she says the following: “He said that she said that she knows that he believes that she is mad at him.” Her mother, concentrating and listening carefully, barely grasps this proposition; let’s suppose it is just at the edge of her comprehension. Sally’s mom knows that Sally tends to side with Billy on things, so when she grasps this proposition she is somewhat skeptical, and is thus only moderately confident that it is true. In other words, Sally’s mom forms a moderately high credence that “he said that she said that she knows that he believes that she is mad at him.” This scenario seems possible, but if it is possible, it creates a serious problem for any content-enhancing belief-first view. Here’s how: Sally’s mom cannot form a belief in the proposition that embeds this sentence in an epistemic modal. The


\(^{15}\) For example, Bengson (2015) discusses a mathematician, Ramanujan, who can easily grasp certain mathematical propositions that ordinary people cannot because the propositions are too complex.

\(^{16}\) Infinitism about justification is the view that a belief is justified by another belief in an infinite proposition or an infinite number of other beliefs. Specifically, some argue that since we cannot grasp, and thus cannot form beliefs about, an infinite proposition (or an infinite number of propositions), infinitism cannot be true. Further, if internalism about justification has a strong awareness condition (we must be aware of our belief’s justifiers), some argue this line of reasoning counts against internalism about justification as well. See Foley (1978: 311-316), BonJour (1985), Audi (1993a, b), Fumerton (1995: 36), Klien (1999), Bergmann (2005: 432, 2006: ch. 1), Fales (2014).

\(^{17}\) Also relevant is the phenomena of “surveyability” in the philosophy of mathematics; some have argued that a proof is defective if it is so complex that it is beyond the comprehension of the other members of the mathematical community. See Tymoczko (1979). See also Hofweber (2017).
proposition Sally stated is just on the edge of her comprehension, so the more complicated modal proposition is too complex for her to grasp. Thus, Sally’s mother cannot have the modal belief that corresponds to her credence; the modal proposition is ungraspable for her.

More generally, suppose that $p$ is a proposition that is just on the edge of S’s abilities of comprehension, such that S cannot grasp a proposition more complex than $p$. Plausibly, S can have a credence in $p$, since S can grasp $p$. However, S cannot grasp $Mp$, and thus cannot form the more complex belief $Mp$. Here is a formalization of this argument:

1. There is a proposition, $p$, that is barely graspable for S, such that S could not grasp a proposition more complex than $p$. [stipulation]
2. S cannot grasp $Mp$, since $Mp$ is more complex than $p$. [premise, from 1]
3. S can have a credence in $p$, since S can grasp $p$. [premise, from 1]
4. Therefore, S cannot believe $Mp$ but S has a credence in $p$. [2, 3]

Premise 1 is plausible and finds support in the literature. For example, Robert Audi (1993a: 209) says, “surely, for a finite mind, there will be some point or other at which the relevant proposition cannot be grasped.” Michael Bergmann (2005: 432) agrees: “before reaching a proposition they are unable to grasp, [agents considering perpetually more complex propositions] will reach one which they can barely grasp.” This is plausibly what is going on in the above case of Sarah's mom and in similar cases. The existence of the propositions referenced in (1), for possible agents in possible scenarios, is hard to deny.

Premise 2 follows from a plausible general principle: one believes a proposition only if one can comprehend the proposition’s content. Audi (1994: 421) states that in order to believe that $p$, one must “have a thought of the relevant proposition $p$”; $p$ must be able to “come to one’s mind.” However, if a proposition is too complex for one to grasp, forming a belief is impossible; if S cannot grasp $Mp$, $Mp$ cannot come to S’s mind in a way that makes it possible for S to believe it.

Note also that this principle is fairly ecumenical when it comes to various views of the nature of belief. It is consistent with the idea that one can have beliefs (maybe dispositional beliefs) that have never been occurrent; for example, you might currently believe that electrons don't wear sneakers even if you’ve never explicitly considered that proposition before. Premise 2 merely commits us to the idea that in order to have a belief that $p$, it must be possible to grasp $p$. This does not require a past occurrent awareness of $p$.

In defense of premise 3, we nonetheless have no reason (that doesn’t presuppose the belief-first view) to think that S cannot have a credence in $p$. S can form a credence in $p$ in virtue of S’s grasping $p$. Returning to our example, Sally's mom graps the complex proposition and forms a moderately high credence in it. Having a credence in $p$ doesn’t require more than this; often, grasping $p$ is sufficient to form a credence in $p$.

Generally, in the case of barely graspable propositions, it seems possible that agents can have credences in them, but cannot form the more complex beliefs required for a belief-first view. Further, note that cases like these are easily explainable by both credence-first and dualist views. On both views, a credence is a unique attitude that does not reduce to a kind of believing, and, crucially, the numerical or probabilistic component of credences is a part of the attitude, rather than part of the content. Thus, on both views, forming a credence in $p$ does not require grasping a proposition more complex than $p$. In this, the graspability concerns outlined here are a unique problem for the belief-first view (which relies on complexified content, rather than a feature of the attitude, to ground the credence).

18 See also Audi (1993b: 127).
Finally, I consider three objections to the above argument; one to each premise.

First, against premise 1, one might object that the set-up is impossible. For instance, the premise seems to assume that graspalibilty is a threshold concept, and that there is a sharp cut off point such that either one grasps a proposition or one does not. Why think there is such a threshold?

In reply, first, it is worth noting that in order for my argument to create a problem for the belief-first view, all I need is one case. I need not claim that there is a sharp graspability cut off in every case, or that there is always a strict binary between graspable and ungraspable. It is consistent with my argument that graspability takes different forms in different contexts; I merely need there to be a threshold of graspability in some possible contexts.

And these contexts do seem possible; many of us have likely had the experience of hearing a proposition that is just on the edge of our comprehension and grasping it, and the experience of hearing a more complex proposition (even a slightly more complex one) and being unable to understand its meaning. Our everyday experience supports the idea that such a cut off exists (even if not in every case). At the very least, insisting such a cut off is impossible puts the belief-firster in the awkward position of having to take a quite controversial stance on the nature of graspability, i.e. that graspability can never, in any case, be a threshold concept. This is a significant cost to the view, and, as noted above, at odds with the way most in the literature have understood graspability. It also raises the question: if not a threshold concept, what is the nature of graspability?

Thus, it is hard to see what would support the claim that cases like these are always impossible. The case I describe above seems like a coherent and even regularly occurring phenomenon: someone states a very complex sentence and you form a degree of confidence in that sentence, even though it is right on the cusp of your comprehension. Without further motivation, we shouldn’t rule out the possibility of these cases a priori.

Against premise 2, two related points. First, one might object that, in the cases described, one can take the complex proposition and give it a label, e.g. $p$, and then form more complicated beliefs about $p$ by using $p$ as a stand-in for the original complex content. Thus, one can actually believe $M_p$, even if the content of $p$ is right on the cusp of one’s comprehension in its original presentation. Further, generally, there are strategies for making initially ungraspable propositions graspable, such as the phenomena of exemplification discussed by Catherine Elgin. Elgin (2009, 2011) argues that in cases where things are quite complex and nuanced, a model or stand-in can exemplify the main points, so we can grasp them.

I take each point in turn. First, I take as a datum that at least some propositions are too complex for agents like us to comprehend. We cannot grasp every proposition; our minds are too limited for that. However, if the ‘labeling strategy’ works and is a legitimate way of grasping a previously ungraspable proposition, this strategy could be utilized to make it the case that all propositions are graspable. That conclusion is absurd, so something goes wrong with the labeling strategy. I suspect the problem is that the agent who uses the labeling strategy is not truly grasping $M_p$. If the objector insists that they are, then we can run the same argument again on the more complex proposition, $M_p$; the agent can have a credence in $M_p$ but cannot grasp $M(M_p)$. At whatever point the agent fails to grasp the proposition in question, we can run the argument above on the step immediately before that point.

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20 [Removed for blind review].
21 [Removed for blind review].
Arguments like Elgin’s raise interesting questions about the bounds of graspability, and are useful for answering questions about where exactly we ought to draw this line between the graspable and the ungraspable. For my argument to work, however, I need not take a stand on where exactly this line is; I just need some boundary (even one that is agent-relative) to exist. Thus, strategies like the one Elgin suggests don’t raise a problem for my argument, since they don’t purport to get rid of the line altogether, but merely argue that we may have drawn it in the wrong place.

Finally, one might object to premise 3, arguing that agents in the cases I describe cannot actually form credences in the relevant propositions. One might argue that, in order to form a credence in p, grasping p is not enough; one actually has to be able to grasp a proposition more complex than p. In reply, it seems difficult to see why forming a credence would require this, unless one was already presupposing something like the belief-first view. Pre-theoretically, it seems possible to form credences in propositions that are graspable, but just on the edge of graspability.22 Further, if forming a credence in p requires grasping a proposition more complex than p, this would have the odd result that, for certain propositions, we would be able to form beliefs in them but not credences. Denying premise 3 does not seem like a promising route.

IV. Upshot and Conclusion

One notable upshot of this argument involves the widely-accepted view that disbelieving p is equivalent to a belief with the content not-p.23 However, this view may also run into trouble in the case of barely graspable propositions; it seems like one ought to be able to disbelieve p in virtue of merely grasping p, but this view would require them to grasp a more complex proposition, i.e. not-p. I leave the details of this argument for further research, as my primary goal in this paper is to argue against belief-first views, but I note this as a possible upshot of my argument.

I’ve argued that any content-enhancing belief-first view runs into serious trouble in the case of propositions on the cusp of one’s graspability. In these cases, one can form a credence in p, but one cannot believe Mp, because Mp is too complex for one to grasp. I conclude that, however credences differ from beliefs, they do not differ virtue of adding additional content to the believed proposition.24

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22 Even if, in most cases, it involves or rationally requires withholding belief/having a middling credence in them, as Bergmann (2005: 432) suggests. Bergmann considers the case of an agent considering a proposition just on the cusp of his graspability. Bergmann notes, “by exerting himself mentally, [he can] barely grasp it, although he also finds himself withholding it because of its complexity. You might think that this is exactly what one should expect to happen to rational people in a reflective mood drawn to continue considering propositions at ever higher levels: before reaching a proposition they are unable to grasp, they will reach one which they can barely grasp and which they will be inclined to withhold because of its complexity.”

23 Proponents of the thesis that disbelieving p just is believing not-p include Bergmann (2005: 420), McCain (2014: 2), Friedman (2013: 166). For an argument that disbelieving p is not equivalent to believing not-p, see Smart (MS).

24 Acknowledgments removed for blind review.


Smart, Joshua. (MS). “Disbelief is a Distinct Doxastic Attitude.” Available at: https://www.academia.edu/35970635/Disbelief_is_a_Distinct_Doxastic_Attitude.


