

# The Tale of Bella and Creda

Scott Sturgeon

*University of Birmingham*

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WE HUMANS BELIEVE ALL KINDS OF THINGS, and we lend credence to them too. These obvious facts about us generate tough questions about our psychology. What is the relation, if any, between belief and credence? Does belief depend for its existence on states of credence? Does credence depend for its existence on states of belief? Is there no dependence — or some kind of co-dependence — between them?

Questions like these strike at the heart of our psychology. Their answers bear directly on what is basic in any area which turns on how our minds work. Facts about whether belief and credence depend on one another help to fix which states are basic, for instance, in epistemology, decision theory, ethics and more; and they help to fix which norms are basic in these areas too. After all, when a given type of state cleanly reduces to another type of state — say in one of the two main ways glossed below — then norms for the reduced state spring directly from those for the reducing state. For these reasons and more, a great deal of philosophical concern turns on the relation between belief and credence. Before discussing that in any detail, however, we should make four points about how the words “belief” and “credence” will be understood here.

First, we’ll use “belief” to stand for a common-sense type of psychological state, one which is routinely placed next to rejection and suspended judgment in a coarse-grained everyday space of psychological attitudes. It is this space which generates the chunking of folks into theists, atheists and agnostics. It is this space which underwrites the everyday platitude that belief is central to the production of good reasoning, the sensible planning of action, the exercise of good character, and other key aspects of quotidian life.

Second, we’ll use “credence” to stand for various common-sense types of psychological state, types which are routinely placed next to one another in a fine-grained everyday space of psychological attitudes. It is this space which generates the chunking of folks into those who are sure that Clinton will be elected in 2016, those who are three-quarters sure that this will happen, and so on. Common-sense structures this fine-grained attitudinal space by marking one of its elements as

strongest, and then using the strength of that element to index strength of other elements in the space. It is this space which underwrites the everyday platitude that one's confidence is central to the production of good reasoning, the sensible planning of action, the exercise of good character, and other key aspects of quotidian life.<sup>1</sup>

Third, we'll presuppose that functionalism is true of belief and credence. To a rough first approximation, this is the view that every such attitude is identical to some kind of signature function. We'll say little about what kinds of functioning are involved in the presupposition here. But we'll assume that notionally-distinct attitudes are genuinely distinct only if manifesting them involves some kind of functional difference; and we'll assume that the identity of functioning, between two notionally-distinct attitudes, is itself sufficient for their genuine identity deep down.

Fourth, we'll presuppose that mental kinds are individuated by their attitudinal components and their contents. If kinds *M* and *M\** involve the very same attitude taken to some contents or other, for instance, we'll count those kinds as identical exactly when the attitude in question is taken to the very same content. Likewise if kinds *M* and *M\** involve some attitudes or other taken to the very same content, we'll count those kinds as identical exactly when they involve the very same attitude taken to that single content.

With these points in place we can discuss the pair of reductive positions which are our main focus. The first of them turns on a doctrine we'll call *credence-as-belief*. To a rough first approximation, this is the view that credence can be lent to a content — metaphysically speaking — by believing a related content. The idea is that certain kinds of belief are enough on their own to ground the fact that credence is being lent. And there are various ways that credence-as-belief could

1. Common-sense also recognises “thick” or “mushy” credence. But we'll use the point-valued varieties in what follows. This is done solely for ease of understanding: nothing turns on our use of maximally thin rather than thicker types of confidence. For useful discussion of all our everyday attitudes — and the work they do in epistemology, decision theory, and other areas of philosophy — see References listed at the end of this paper.

be true of an agent. Were she to function as if she lent  $\ell$ -credence to *C* in virtue of believing that *C*'s probability equals  $\ell$ , for instance, or were she to do so in virtue of believing that *C*'s probability is high, then credence-as-belief would be true of the agent in question. Her psychological architecture would make it the case that she functions as a lender of credence — and thereby counts as a lender of credence — even though that architecture also makes it the case that she manages to lend credence, deep down, by believing things. At bottom she is a belief-first creature, someone for whom belief is psychologically prior to metaphysically derivative states of credence.

Philosophers have argued at length about whether we are belief-first creatures — about whether the doctrine of credence-as-belief is true of us. And their arguments have turned on all kinds of resource — analysis of everyday talk of the attitudes, analysis of the nature of action-explanation, consideration to do with acting-for-a-reason, more. But we needn't pronounce on the *bona fides* of such arguments, for our topic gets off the ground once a weak-looking thesis is granted, namely, that belief-first creatures are possible. This is not the view that we are belief-first creatures. It is the view that such creatures can exist in principle, that God could create them were she to wish to (as it were). Suppose that is so in what follows and that the eponymous Bella is a belief-first creature. This is to suppose that Bella believes and lends credence as a matter of course, but that deep down she manages the latter by doing the former.<sup>2</sup>

The second position to be discussed turns on a doctrine we'll call *belief-as-credence*. To a rough first approximation, this is the view that

2. See Holton (forthcoming) or Lance (1995) for a defence of the view that we are belief-first creatures. In the verbal tradition, at least, the view is also popular with those who defend the computational theory of mind. And it is easy to see why this might be so: the computational theory, after all, provides non-trivial purchase on the statics and kinematics of belief (see Fodor [1975]). If we are belief-first creatures, therefore, the computational theory also yields such purchase on the statics and kinematics of credal states: how they enter into reasoning, how they stand in logical relations to one another, how they can be rejected, and so on. None of this is clear on a credence-first picture of mind (to put it mildly). See Staffel (2013) for related discussion.

belief can be lent to a content — metaphysically speaking — by lending certain kinds of credence to that very content. The idea is that these types of credence are enough, on their own, to ground the fact that belief is being lent. And here too there are various ways that the doctrine could be true of a given an agent. Were she to function as if she believed C in virtue of lending  $\ell$ -level credence to C — with  $\ell$  in some fixed range of values — or were she to function as if she believed C in virtue of lending sufficiently strong credence to C — with strength and sufficiency each being left vague and contextually variable — then, belief-as-credence would be true of the agent in question. Her psychological architecture would make it the case that she functions as a believer — and thereby counts as a believer — even though that architecture also makes it the case that she manages to believe, deep down, by lending credence. At bottom she is a credence-first creature, someone for whom credence is psychologically prior to metaphysically derivative states of belief.

Philosophers have also argued at length about whether we are credence-first creatures — about whether the doctrine of belief-as-credence is true of us. And once more the arguments have made use of all kinds of resource; but here too we needn't decide on the success of the arguments, for once again the key question before us is one of possibility. It is not whether we are credence-first creatures but rather if such creatures are possible at all. Suppose that is so in what follows and that the eponymous Creda is a credence-first creature. This is to suppose that Creda believes and lends credence as a matter of course, but that deep down she manages the former by doing the latter.<sup>3</sup>

In a nutshell, then, we start by assuming that credence-as-belief is true of Bella and that belief-as-credence is true of Creda. At the base of their respective psychologies, we assume, Bella lends credence by believing and Creda believes by lending credence. To understand better

3. See Christensen (2004), Foley (1993), or Sturgeon (2008) for a defence of the view that we are credence-first creatures. The view is also taken as read in a great deal of philosophy of mind, and, arguably, in common-sense as well. See Sturgeon (forthcoming) for discussion.

what these assumptions come to — and to generate vivid-and-reliable metaphors to track salient similarities and differences between Bella and Creda — we make use of two further ideas in the telling of their tale.

First, we assume that Bella and Creda think in a language-of-thought.<sup>4</sup> Second, we assume at the base of their respective psychologies that Bella and Creda lend an attitude A to content a C by placing a C-meaning sentence of their language-of-thought in a functionally-individuated “mental box”: the A-box.<sup>5</sup> We stipulate that the A-box is defined so that whenever a C-meaning sentence is placed within it, the agent thereby functions in whatever way is the signature function of those who lend A to C.

Bella has a single attitude box of relevance: the belief box. She adopts a psychologically basic belief in a content C by placing a C-meaning sentence of her *lingua mentis* in the belief box. Credence-as-belief is also true of Bella, of course, so her psychological make-up involves lending credence as well as belief. But her lending of credence is done, in the first instance, by a sentence of Bella's language-of-thought being placed in the belief box — where the sentence in question speaks to the probability of the claim to which credence is being lent (or something like that).

Likewise, Creda has many attitude boxes of relevance: one for each type of credence she can basically lend. Creda so lends  $\ell$ -level credence to C by placing a C-meaning sentence of her *lingua mentis* in the  $\ell$ -box — the box individuated to ensure that whenever a sentence is placed within it, Creda functions in the signature way of those who lend  $\ell$ -level credence. Belief-as-credence is also true of Creda, of course, so her psychological make-up involves lending belief as well as credence. But her lending of belief is done, in the first instance, by having a meaningful sentence of her language-of-thought placed in an aptly strong credal box.

Once it is assumed that belief-first creatures like Bella are possible, however, and also assumed that credence-first creatures like Creda

4. Fodor (1975).

5. Here we generalise a metaphor introduced in Schiffer (1981).

are possible, it is natural to wonder if the two types of creature are not in fact notational variants of one another. After all, everyone agrees – who accepts that each type of creature is possible – that agents of both types end-up with belief and credence; and every such theorist agrees that agents like Bella and Creda differ solely in how their psychologies get the job done. One ends-up believing by lending credence, the other ends-up lending credence by believing. For epistemic or moral or decision-theoretic purposes, then, the symmetry makes it seem as if salient differences between Bella and Creda show up, if at all, only at the base of their respective psychologies. This prompts the idea that differences between them make no real philosophical difference, that epistemology, ethics etc. should see Bella and Creda as notational variants. Their symmetry prompts the thought that it does not *matter* when theorizing philosophically whether we are creatures like Bella, creatures like Creda, or creatures like something else yet again.

The worry is pressing in light of our functionalism about the attitudes. Recall that both the language-of-thought and attitude-boxes are meant to be functionally individuated. This makes it an open theoretical possibility – to put it mildly – that credence boxes in one creature are realised by complex mental sentences being placed in the belief box in that creature while, at the same time, in another creature, the belief box is itself realised by less complex mental sentences being placed within a complex array of credal boxes. The trade-off here looks to be one between a relatively complex array of mental sentences interacting with a single attitude box on the one hand, and a potentially simpler array of mental sentences interacting with a relatively complex array of attitude boxes on the other. That looks to be just the sort of difference-in-implementation from which functionalism is meant to abstract. Hence functionalists are *prima facie* motivated to view Bella and Creda as notational variants: from their perspective, differences between them look solely to turn on how functional states are realised in an agent's psychology, which in turn will prompt the idea that nothing of philosophical substance

depends on whether we are creatures like Bella, creatures like Creda, or something else yet again.

But this cannot be right. Bella and Creda are not notational variants of one another. The demonstration of this is best put forward with a single new bit of terminology. So let us say that two agents are *like-minded* exactly when for any content C and level of credence  $\ell$ , either both believe C or fail to do so, and either both lend  $\ell$ -credence to C or fail to do so. Like-minded agents manifest precisely the same beliefs and states of credence. By supposing that Bella and Creda are like-minded, it is easy to show that each of them manifests a configuration of epistemic states unlike any which could be enjoyed by human beings.

To see this, suppose Bella and Creda are like-minded and that Bella believes C. Then Creda must also believe C, by their like-mindedness. Yet belief-as-credence is true of Creda, so her belief in C must itself be got by investing a level of credence in C. Let that level of credence be  $\ell$ . Since Bella and Creda are like-minded, it follows that Bella also invests  $\ell$ -credence in C. Yet credence-as-belief is true of Bella, so Bella manages to invest  $\ell$ -credence in C by believing a claim like  $\mathbf{prob}(C)=\ell$ . Since Bella and Creda are like-minded, though, it follows that Creda also believes that claim. Since belief-as-credence is true of Creda, it follows that she ends-up believing the claim that  $\mathbf{prob}(C)=\ell$  by lending credence to that very claim. Let her credence in that very claim be  $\ell^*$ -level credence. Like-mindedness then ensures that Bella also lends  $\ell^*$ -credence to the claim that  $\mathbf{prob}(C)=\ell$ . Since credence-as-belief is true of Bella, though, she ends-up lending  $\ell^*$ -credence to the claim that  $\mathbf{prob}(C)=\ell$  by believing the more complicated claim that  $\mathbf{prob}[\mathbf{prob}(C)=\ell]=\ell^*$ . And so on. The bottom line is this: when like-minded belief- and credence-first agents believe an arbitrary claim C, and when the belief-first agent lends credence via belief in claims formed with something like a probability operator  $\mathbf{prob}(-)$ , then, for any natural number  $n$ , the two agents also believe a claim of the form

$$\mathbf{prob}_n\{\mathbf{prob}_{n-1}(\dots[\mathbf{prob}_1(C)=\text{value}_1]=\text{value}_2]\dots)=\text{value}_n\}.$$

Likewise, suppose Bella and Creda are like-minded and that Creda

invests  $\ell$ -credence in  $C$ . Then Bella must also lend  $\ell$ -credence to  $C$ , as she and Creda are like-minded. Since credence-as-belief is true of Bella, however, she will lend  $\ell$ -credence to  $C$  by believing a claim like  $\mathbf{prob}(C)=\ell$ . Like-mindedness will then ensure that Creda also believes the claim that  $\mathbf{prob}(C)=\ell$ . Yet belief-as-credence is true of Creda; so her belief in the claim that  $\mathbf{prob}(C)=\ell$  is got by lending credence to that very claim. Let her credence in that very claim be  $\ell^*$ -level credence. Like-mindedness then ensures that Bella also lends  $\ell^*$ -credence to the claim that  $\mathbf{prob}(C)=\ell$ . Since credence-as-belief is true of Bella, however, she lends  $\ell^*$ -credence to the claim that  $\mathbf{prob}(C)=\ell$  by believing the more complicated claim that  $\mathbf{prob}[\mathbf{prob}(C)=\ell]=\ell^*$ . Like-mindedness then ensures that Creda also believes that more complicated claim. And since belief-as-credence is true of Creda, her belief in the more complicated claim is itself got by lending credence to that very claim: *i.e.*, by lending credence to the claim that  $\mathbf{prob}[\mathbf{prob}(C)=\ell]=\ell^*$ . And so on. The bottom line is this: when like-minded belief- and credence-first agents lend credence to an arbitrary claim  $C$ , and when the belief-first agent lends credence via belief in claims formed with something like a probability operator  $\mathbf{prob}(-)$ , then, for any natural number  $n$ , the two agents also lend credence to a claim of the form

$$\mathbf{prob}_n\{\mathbf{prob}_{n-1}\{\dots\{\mathbf{prob}_1(C)=\text{value}_1\}=\text{value}_2\}\dots\}=\text{value}_n.$$

Putting all this together, then, we have the following: for any claim  $C$ , and any natural number  $n$ , belief- and credence-first agents are like-minded only if

- (a) whenever they believe  $C$ , they also believe the result of embedding  $C$  into an  $n$ -length iteration of the operator used by the belief-first agent to lend credence.

and

- (b) whenever they lend credence to  $C$ , they lend credence to the  $n^{\text{th}}$ -length embedding mentioned in (a).<sup>6</sup>

6. It is easy to turn these intuitive lines of argument into proofs by induction on

Like-minded belief- and credence-first creatures manifest an *inhuman* configuration of attitudes. There is no finite upper bound on the number of attitudinal states they enjoy. There is no such bound on the surface complexity of contents to which they lend belief and/or credence.

Whenever a belief-first agent fails to manifest such a configuration of attitudes — say by having a human-like set of epistemic states — that agent cannot be replicated by a credence-first cousin. No such cousin can possess exactly the attitudes manifested by the human-like belief-first agent. Similarly, whenever a credence-first agent manifests a normal set of epistemic states, that agent cannot be replicated by a belief-first cousin. No such cousin can possess exactly the attitudes manifested by the human-like credence-first agent. Functionalism about the attitudes does not render differences between Bella and Creda benign. At most, one of them can model our epistemic states.

From a formal point of view it is clear why there is a doxastic explosion between like-minded belief- and credence-first creatures. A principle of the following form will be true of any credence-first agent like Creda:

$$\text{(BAC)} \quad \mathbf{b}(\Phi) \supset \mathbf{cr}^*(\Phi).$$

Since belief-as-credence holds of any such agent, they manage belief in  $\Phi$  by lending (something like) high credence to  $\Phi$ . Yet a principle of the following form will be true of any belief-first agent like Bella:

$$\text{(CAB)} \quad \mathbf{cr}(\Phi) \supset \mathbf{b}[\text{operator}(\Phi)].$$

*n*. Back-and-forth arguments like this apply only to positions on which belief and credence fold into one another in an elegant one-by-one fashion. They do not apply — so far as I can see — to belief- or credence-first views which are shaped, for instance, like non-reductive materialism: *i.e.*, views which claim that credence is belief deep down, or the reverse, but also claim only that something like global supervenience holds between them. Rather different views of this sort have recently been defended: see Frankish (2009) and Leitgeb (2014). See also Baker (2009) for non-reductive materialism and McLaughlin (1995) for global supervenience.



Since credence-as-belief is true of any such agent, they lend credence to  $\Phi$  by believing a content got by embedding  $\Phi$  in a content-forming operator of some kind. Whenever two agents are like-minded, though, they share exactly the same beliefs and states of credence. If one of them is a credence-first creature, while the other is a belief-first creature, principles like (BAC) and (CAB) will each be true of a *single* set of attitudes. Jointly, they make for explosive schemata: one for belief, another for credence.

After all, the belief-as-credence schema (BAC) ensures that there is high credence lent to  $\Phi$  whenever  $\Phi$  is believed; and the credence-as-belief schema (CAB) ensures that there is belief in a content of the form [operator( $\Phi$ )] whenever credence is lent to  $\Phi$ . For any content  $\Phi$  whatsoever, then, and any set of attitudes for which both principles hold, the following will also hold of belief:

$$(B) \quad \mathbf{b}(\Phi) \supset \mathbf{b}[\text{operator}(\Phi)].$$

That is why there is an explosion of things believed by like-minded belief-and credence-first agents. Schema (B) guarantees the explosion: any content found on the right-hand side of one of its instances is also found on the left-hand side of another of those instances.

Similarly, the credence-as-belief schema (CAB) ensures that there is belief in a claim of the form [operator( $\Phi$ )] whenever credence is lent to  $\Phi$ ; and the belief-as-credence schema (BAC) ensures that high credence is lent to a content when that content is believed. For any content  $\Phi$  whatsoever, then, and any set of attitudes for which both principles hold, the following will also hold of credence:

$$(C) \quad \mathbf{cr}(\Phi) \supset \mathbf{cr}^*[\text{operator}(\Phi)].^7$$

7. Here one should ask: what sort of high credence makes for belief? We obviously believe things of which we're not absolutely certain. Fully maximal credence should not be required for belief. Once that is granted, though, (C) will involve some sort of sub-optimality; for (C) will have instances with  $\mathbf{cr}(F)$  unequal to  $\mathbf{cr}[\text{operator}(F)]$ . Yet the content-forming operator will be something like a probability operator, or a likelihood-of-truth operator, or some such. So with  $\mathbf{cr}$  non-degenerate the relevant instances of (C) will be situations like being exactly 95% certain of  $F$  while being less than certain that the

That is why there is an explosion of things to which credence is lent by like-minded belief- and credence-first agents. Schema (C) guarantees the explosion: any content found on the right-hand side of one of its instances is also found on the left-hand side of another of those instances.

Normal belief-first creatures — *i.e.*, those with human-like configurations of attitude — cannot be replicated in a credence-first way; and normal credence-first creatures — *i.e.*, those with human-like configurations of attitude — cannot be replicated in a belief-first way. Every human-like configuration of attitudes is such that either it is impossible for a credence-first creature like Creda to manifest exactly those attitudes or it is impossible for a belief-first creature like Bella to do so. If both kinds of creature could manage the task, after all, like-minded creatures of each kind could manifest a human-like configuration of attitudes. But that is not possible.<sup>8</sup>

A natural response to the explosion arguments is this:

OK, belief- and credence-first creatures cannot be like-minded if either exhibits a human-like configuration of attitude. It is still an empirical issue whether our psychological architecture is like Bella, like Creda, or neither. After all, belief- and credence-first creatures are obviously possible. Given well-known differences

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probability of  $F$  is 95%, or less than certain that the likelihood of  $F$ 's truth is 95%, or whatever.

8. Suppose that for some number  $n$  it turns out that everyday purposes only concern the functioning of our attitudes taken to contents involving no more than  $n$  nested probability operators. Then — as a Reader for this journal points out — the paper's explosion argument does not rule out that like-minded belief- and credence-first creatures model attitudes up to but not exceeding  $n$  nested probability operators. In the event such creatures might model us for all practical purposes.

That is true. But the paper's argument concerns more than practical interest. It covers all functionally-relevant aspects of our mental life. Those aspects might be difficult to discern — perhaps only a serious science could discern them. But functionalism about the attitudes, plus the paper's explosion argument, guarantee that like-minded belief- and credence-first creatures could not be like us in all functionally discernible respects.

between Texans and Californians, then, science may discover that Texans are all Bellas and Californians are all Credas (so to say). We'll just have to investigate.

But part of this response is wrong; for it turns out that it is not the case that belief- and credence-first creatures are each possible. Reflection on their metaphysics reveals that only one type of creature, at most, is possible.

To see this the key place to start is with the following thought: both doctrines in play here—belief-as-credence and credence-as-belief—entail that facts about one kind of attitude come for free once facts about another kind of attitude are settled. This is true because both doctrines maintain that instances of one type of attitude are elegantly grounded, one-by-one, by instances of another type of attitude. The two doctrines diverge in which types of attitude they see as grounded, and they diverge in which they see as doing the grounding work, but belief-as-credence and credence-as-belief agree that some attitudinal facts metaphysically derive, in an elegant way, from other attitudinal facts. This symmetry precludes it being the case that each doctrine is possible.

To see why, recall that belief-as-credence ensures that belief in  $\Phi$  comes for free once high credence in  $\Phi$  is in place, and credence-as-belief ensures that high credence in  $\Phi$  comes for free once belief in (something like) the high probability of  $\Phi$  is in place. The doctrines are each possible only if each side of this picture is too:



Figure 1

Downward arrows in Figure 1 depict that once a lower attitudinal condition is in place, a higher attitudinal condition is nothing over and above the lower one. The higher one comes for free. It is grounded in the lower attitudinal condition.

The key point is then drawn from metaphysics: coming-for-free is a *modally invariant relation*. If, at any world, one condition comes for free once another is in place, then, at every world, that condition comes for free once the other is in place.<sup>9</sup> If it is so much as possible that belief in  $\Phi$  comes for free once high credence in  $\Phi$  is in place, therefore, it is necessarily the case that belief in  $\Phi$  comes for free once high credence in  $\Phi$  is in place. And if it is so much as possible that high credence in  $\Phi$  comes for free once belief in the high probability of  $\Phi$  is in place, therefore, it is necessarily the case that high credence in  $\Phi$  comes for free once belief in the high probability of  $\Phi$  is in place.

This means that if belief-as-credence and credence-as-belief are each possible, two further claims about grounding are the case. One is that belief in  $\Phi$  comes for free once belief in  $\Phi$ 's high probability is in place. The other is that high credence in  $\Phi$  comes for free once high credence in  $\Phi$ 's high probability is in place. Belief-as-credence and credence-as-belief are each possible, in other words, only if each side of this picture is too:



Figure 2

where downward arrows continue to depict that a higher condition is grounded in a lower one. Figure 2's left-hand dependence is got by

9. This is a modalized version of a popular principle in the grounding literature. That principle is often called "Necessitation". Rosen (2010) proposes it on under the label "Entailment". See Trogden (2013) and Skiles (forthcoming) for further discussion.

taking the right-hand and then the left-hand dependence of Figure 1, in that order. And Figure 2's right-hand dependence is got by taking the left-hand and then right-hand dependence of Figure 1, in that order, with the relevant content being  $[\text{prob}^*(\Phi)]$ .

These last depictions of grounding are obviously wrong. They are each of the form

$$\begin{array}{c} @(\Phi) \\ \Downarrow \\ @[\text{prob}^*(\Phi)]. \end{array}$$

The idea is that lending a given attitude to a content is itself grounded in that very attitude being lent to a second content—a second content which makes likely, but does not entail, the first content involved in the case. But that cannot be. Since a single attitude is meant to be involved in the putatively grounding and grounded fact, and since the content of the former does not entail that of the latter, the putative grounded condition—*i.e.* the one that is meant to come for free—should itself have *stronger* functional constituents than the putative grounding condition—*i.e.*, the one meant to make for what is meant to be grounded. Yet a single attitude lent to a claim cannot be grounded in that very attitude being lent to a second claim which fails to entail the first.

For example, despite a good deal of disagreement about which functions are essential to belief in  $\Phi$ , most everyone agrees that such belief essentially involves a strong and immediate disposition to do at least one of the following:

- (a) use  $\Phi$  in practical deliberation,
- (b) use  $\Phi$  in theoretical deliberation,
- (c) say 'yes' when asked whether  $\Phi$  is true.

Belief in the high probability of  $\Phi$  essentially involves none of these things. When you have such belief you may well be disposed to use  $\Phi$

in (a)- or (b)-style deliberation, and you may well be disposed to say 'yes' when asked if  $\Phi$  is true; but these dispositions will be recognizably weaker than the counterpart dispositions flowing directly from belief in  $\Phi$ . After all, the claim that  $\Phi$ 's probability is high makes it likely that  $\Phi$  is true, but it does not ensure that  $\Phi$  is true; so dispositions which flow directly from belief in the probabilistic content will be milder variants of those which flow directly from belief in  $\Phi$ . Hence the left-hand dependency of Figure 2 fails. We have seen, though, that that very dependency is entailed by the possibility of belief-as-credence together with that of credence-as-belief. One or both of those doctrines is not possible. Either Creda or Bella is an impossible agent.

Similarly, high credence in the claim that  $\Phi$  is very probable is itself a weaker state than is equally high credence in  $\Phi$ . If you are 95% sure that the probability of  $\Phi$  is 95%, for instance, then, typically, you will be less than 95% sure of  $\Phi$ . And while it is possible to be 95% sure of  $\Phi$  while also being 95% sure that the probability of  $\Phi$  is 95%, being in the latter condition is no guarantee of being in the former. Hence the right-hand dependency of Figure 2 also fails. Yet that dependency is itself entailed by the possibility of belief-as-credence together with that of credence-as-belief. One or both of those doctrines is not possible. Either Bella or Creda is an impossible agent.<sup>10</sup>

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