The Philosophical Quarterly Vol. 0, No. 0 *2022*
ISSN 0031-8094 https://doi.org/10.1093/pq/pqac007

I HEAR YOU FEEL CONFIDENT

By Adam Michael Bricker*

Here I explore a new line of evidence for belief–credence dualism, the thesis that beliefs and credences are distinct and equally fundamental types of mental states. Despite considerable recent disagreement over this thesis, little attention has been paid in philosophy to differences in how our mindreading systems represent the beliefs and credences of others. Fascinatingly, the systems we rely on to accurately and efficiently track others' mental states appear to function like belief–credence dualists: Credence is tracked like an emotional state, composed of both representational and affective content, whereas belief is tracked like a bare representational state with no affective component. I argue on a preliminary basis that, in this particular case, the mechanics of mentalizing likely pick out a genuine affective dimension to credence that is absent for belief, further strengthening the converging case for belief–credence dualism.

Keywords: epistemology, theory of mind, mentalizing, confidence, partial belief, affect.

I. INTRODUCTION: BELIEF AND CREDENCE

Just now I've formed the belief that there are three bananas on my desk. As is characteristic of the formation of belief states, my options in this matter were quite limited. Beyond forming the obvious belief upon seeing what certainly appear to be three bananas sitting where I normally keep my fruit, I could have instead *disbelieved* that there were in fact three bananas on my desk or *withheld forming a belief* with respect to whether there were three bananas on my desk. This coarse-grained doxastic structure is central to the characterization of belief states: For some proposition p, one's only options are to (1) believe that p, (2) disbelieve that p or (3) withhold belief whether p.

In addition to believing that there are three bananas on the desk, I am also quite confident that there are three bananas on the desk. As with belief, the formation of these confidence states is a staple of human cognition. However, in contrast with the three-valued belief state, I have far more options for my level of confidence, or *credence*, that there are three bananas on the desk. In fact,

my credence can be continuously variable: I could be maximally confident, highly confident, somewhat confident, almost confident, not confident at all, or anything in between. This fine-grained doxastic structure is central to the characterization of credence states and is commonly expressed numerically as ranging between 0 and 1, with credence 0 corresponding with maximal confidence that not p, credence 0.5 corresponding with no greater confidence for p than for not p, and credence 1 corresponding with maximal confidence that p.

The precise relationship between belief and credence states has been the subject of considerable recent debate, which has largely centred around the question of whether one of these types of states reduces to the other (for an excellent overview, see Jackson 2020). Occupying one side of this debate are *monist accounts*, which maintain that beliefs and credences are in fact a single type of mental state: On *credence-first monism*, credence is the basic mental state, with beliefs reducing to a particular class of credences. Different versions of credence-first monism maintain that beliefs are either (1) credences of 1 (e.g. Clarke 2013; Greco 2015; Dodd 2016) or (2) credences above some (<1) threshold (e.g. van Fraassen 1995; Sturgeon 2008; Foley 2009; Lee 2017; Dorst 2019). Conversely, on *belief-first monism*, belief is the basic mental state. For example, credence c that p might reduce to the belief that the probability of p is c (see Moon and Jackson 2020) or the tendency of strength c to believe that p (Kauss 2020).

Contrasting with monism, *dualist accounts* maintain that neither credences nor beliefs reduce to the other (e.g. Pettigrew 2015; Friedman 2019; Jackson 2019; Weisberg 2020). Instead, on the dualist view, credences and beliefs are distinct types of mental states. While it might be the case that our beliefs and credences frequently (or even always) coincide (for more on the question of independence, see Jackson 2021), the dualist maintains that they are nevertheless distinct.

The aim of this paper is to explore a new kind of argument in favour of this belief–credence dualism. Central to this argument is the observation that we often employ distinct neurocognitive mechanisms for tracking belief and credence states, mechanisms that operate on quite different sorts of perceptual cues. Crucially, our Theory of Mind[1] (ToM) systems frequently track credence states via auditory cues associated with affective content. When paired with the observation that these systems can and do track belief states without making use of any cues indicative of affective content, we are left with a clear picture of belief and credence on the ontology of the systems that track them—belief is tracked like a purely representational state, with no affective content, whereas

[1] Note that here I will use 'Theory of Mind' in an imprecise way to refer to the totality of the human capacity to track the mental states of others, without any restrictions to particular neurocognitive systems or classes of mental states.

credence is tracked like an emotional state, with both intentional and affective components. All told, our mental state tracking systems are straightforwardly understood as dualists, right down to the neural level, handling beliefs and credences as separate types of attitudes others might hold with respect to p.

These considerations converge with experimental results previously reported by Buckwalter *et al.* (2015), which found that participants attribute 'thin' belief—a 'bare' representational state—differently than 'thick belief'—loosely characterized by the presence of assent or some emotional element (p. 749). While attributions of thick belief were observed to violate the entailment principle (knowledge entails belief), the same didn't hold for attributions of thin belief. On this basis, Buckwalter *et al.* conclude that thick and thin belief 'approximate genuinely distinct categories within folk psychology' (p. 748), even going so far as to (briefly) speculate that thin belief might be 'discrete' and thick belief 'continuous' (p. 798). The empirical evidence I'll discuss here corroborates this claim, clarifying how our ToM systems distinguish between purely representational, discrete belief states and graded credence states with both representational and affective components.

It would of course be a bit hasty to draw any definitive conclusions about the actual relationship between belief and credence from these observations alone. After all, actual mental ontology may not match the categories employed by the neurocognitive systems dedicated to tracking mental states. Nevertheless, even if we are generally wary of the idea that the empirical details of mental state attribution tell us something about the nature of the states themselves, here we have good reason to think that our ToM systems are right. Asymmetries between how we ordinarily talk about belief and credence states, along with our own introspective judgements about the feeling of confidence, closely align with the idea that credence is something much closer to an emotional state than is belief. Taken together, we find a suite of considerations that all point in the same direction: ToM processes, ordinary language, and even our introspective judgements all seem to pick out a genuine affective component present in credence states but absent in belief states. At a minimum, this places pressure on the monist to account for this apparent asymmetry in affective content. In this manner, we might understand the evidence surveyed here as straightforwardly, if defeasibly, supporting belief–credence dualism. Additionally, if one is committed to the view that the categories employed in mental state attribution generally match actual mental ontology (e.g. Nagel 2013; Bricker 2021), then belief–credence dualism follows quite straightforwardly.

In presenting this argument, I'll begin by discussing a few key neurocognitive mechanisms responsible for much of our ability to successfully track the beliefs and credences of others (§2). Far from providing an exhaustive account of the empirical details of belief and credence attribution, I'll instead focus specifically on a few widely employed mechanisms, contrasting the perspectival tracking of belief with the prosodic cues that underlie much of our credence tracking.

From this contrast, I'll then argue that, on the ontology of ToM systems, belief and credence are tracked like two different types of states (§3). Roughly, ToM-ontology takes credence, but not belief, to be something resembling an emotional state, with both intentional and affective components. Finally, I'll consider whether the belief–credence dualism displayed by ToM-ontology lends any support to dualism on actual mental ontology (§4). Crucially, as the differences in affective content identified by our ToM systems closely match differences in how we talk and think about the beliefs and credences of others, the sum effect is that we have good prima facie reason to conclude that these systems are indeed picking out a genuine difference between belief and credence states.

II. CONTRASTING NEUROCOGNITIVE MECHANISMS FOR BELIEF AND CREDENCE ATTRIBUTION

Much like the formation of belief and credence states, the capacity to successfully *track* these states in others plays an important role in everyday life. A staple of human social cognition, the ability to reliably evaluate the mental states of others—often referred to collectively as 'ToM', 'mentalizing', or 'mindreading' (for a neuroscience-oriented overview, see Mahy *et al.* 2014)—is indispensable in our successful navigation of social environments. In order to track the mental states of others, human ToM systems employ a variety of neural and cognitive mechanisms, which can differ with what state they seek to track.[2] As I'll discuss in this section, belief and credence states provide an excellent illustration of this variation in attributive mechanisms: Prototypical cases are often associated with largely distinct neurocognitive mechanisms, mechanisms which operate on quite divergent classes of perceptual cues. Roughly speaking, belief attribution is often computed via perspectival mechanisms, which operate on coarse-grained, causally upstream visual cues about the state of reality that produces the belief state being tracked. In contrast, credence attribution is largely facilitated by mechanisms that operate on fine-grained, causally downstream auditory cues like vocal pitch dynamics, which are produced by credence states themselves and, crucially, are closely associated with affective content. To be clear, this contrast by no means constitutes a complete account of the mechanisms of belief and credence attribution. Just like any other mental states, we might expect significant overlap in the classes of cues associated with beliefs and credences, and there are of course both behavioural and lexical cues closely associated with both. The important point here isn't just that these cues can be different. Frequent differences in cues alone might

[2] For example, neurophysiological evidence suggests that knowledge and belief attribution vary in their recruitment of self-perspective inhibition (Bricker 2020).

not mean anything substantive at all. Instead, what's important here is *how and why* they're different. As I'll argue in the next section, the differences between belief and credence attribution outlined here indicate that they are tracked as if they are two distinct types of mental states. Before unpacking the mental ontology displayed by our ToM systems, however, we first need an empirical characterization of how these systems can track beliefs and credences differently.

Let's begin with belief. One of the most basic ways in which we track an agent's belief states is through tracking visual information available to the agent (see e.g. Samson *et al.* 2010). At least under normal, everyday circumstances, the visual information available to an agent will closely correspond with what she believes, allowing us to then use this information as a basis for tracking her belief states. For example, if I see that all three bananas on the table are visible on Lucy's perspective—and that no banana-sized portion of the table is occluded from her perspective—I'll readily attribute the belief to Lucy that there are three bananas on the table. Conversely, if only two of the bananas are visible on her perspective, I might attribute to her the belief that there are only two bananas on the table—or, depending on the precise details of the occlusion, I may attribute to her a withholding of belief with respect to the exact banana count. In any case, regardless of the actual belief I attribute to Lucy, what I'm doing is tracking Lucy's belief state by tracking the visual information available on Lucy's perspective, which under normal circumstances will produce a particular belief state in Lucy. Fascinatingly, I'm not actually relying on any downstream perceptual cues *produced by* the state I'm tracking, but instead the upstream cues *that produce* the state. A bit more precisely, I'm tracking the representational content that will constitute Lucy's belief state by tracking the visual information that the state will represent. This sort of perspectival tracking is widely understood to be a major way in which we attribute beliefs to others, providing the basis for one of the most widely implemented experimental paradigms for the empirical study of belief attribution (Call and Tomasello 1999; see also Samson *et al.* 2004, 2005; Kaminski *et al.* 2008; Fabricius *et al.* 2010; van Der Meer *et al.* 2011; Bricker 2020).[3]

One of the most important neurocognitive mechanisms for successfully tracking S's beliefs on the basis of her visual perspective is *visual perspective taking*. As the name suggests, visual perspective taking is roughly the 'ability to put ourselves into the shoes of another' and represent the visual information available on the other's perspective (Surtees *et al.* 2013, 426; for a more critical discussion, see Samuel *et al.* 2021). This capacity to form representations about the visual perspectives of others has been widely studied for decades

[3] Note also that this mode of belief attribution features prominently in epistemology, e.g. Russell's stopped clock (1948, 154) and Goldman on fake barns (1976, 772).

(see e.g. Masangkay *et al.* 1974; Flavell *et al.* 1981; Samson *et al.* 2005; Moll and Tomasello 2006; Samuel *et al.* 2021), is supported by neural processes in the temporoparietal junction (Schurz *et al.* 2013, 2015; Schuwerk *et al.* 2014; Özdem *et al.* 2019; for an overview, see Heleven and Van Overwalle 2018), and may even occur automatically in the absence of any task-specific demand for perspective taking (Samson *et al.* 2010; Surtees and Apperly 2012). Most importantly for our purposes, the ability to represent the visual information available on the other's perspective is an integral part of successfully tracking the belief states of others on the basis of visual information that produces those states—without such a perspective-taking capacity, we would be left to infer the beliefs of others only on the basis of the information available *to us*, which often doesn't match the information available to others. We see this result borne out empirically, as deficits in visual perspective taking are closely associated with the inability to successfully track others' beliefs (Samson *et al.* 2007).

Let's turn now to credence. Contrasting with the coarse-grained perspectival mechanisms that underlie much of our ability to track the beliefs of others, credence attribution relies heavily on graded cues generated by the credence states it aims to track. The most important of these perceptual cues are auditory, with prosodic markers (especially pitch dynamics) during assertion functioning as important signals of a speaker's confidence in that assertion.[4]

The prosodic tracking of credence states proceeds roughly as follows: First, a speaker's degree of confidence when asserting that p is encoded into acoustic properties of her voice, most importantly pitch dynamics, with more confident assertions associated with falling pitch and unconfident assertions associated with rising pitch (Jiang and Pell 2017). As confident and unconfident assertions generally sound different, our neurocognitive credence-tracking systems can then use these differences in auditory cues to rapidly and automatically work out the confidence of others when they assert that p. This has been demonstrated quite conclusively by a series of studies from Jiang & Pell, which observed that participants can quickly and accurately judge a speaker's level of confidence in her assertion[5] on the basis of prosodic cues alone, ultimately concluding that 'a listener's brain is rapidly attuned to vocal cues that signal one's [degree of confidence]' (2015, 24; also Jiang and Pell 2016; Jiang *et al.* 2017). Importantly for our purposes, neurophysiological evidence indicates that neutral-sounding statements are processed differently than all prosodically marked statements, whether marked for high or low speaker confidence (Jiang and Pell 2015, §3.2). All this means that, when Lucy asserts, 'There are three bananas on the table', her high level of confidence will under ordinary

[4] Note that there are also nonverbal counterparts to some of these auditory cues, e.g. facial expression (Kuhlen et al. 2015).

[5] Participants evaluated speaker confidence for simple assertions like, 'She has access to the building', 'I'll finish the essay tonight', and 'She'll do a good job' (Jiang and Pell 2015, 25).

conditions result in vocal patterns that we as hearers automatically detect, allowing us to efficiently track Lucy's credence state. Fascinatingly, this encoding of confidence information into pitch dynamics allows us to at least partially track the magnitude of the credence states of others even when we have no access to the representational content of those states—for example, when this information is encoded in unintelligible pseudo-utterances (Pell 2007; Monetta *et al.* 2008).

At this point, we might observe that this mode of credence tracking closely mirrors that widely used to track mental states with significant affective components. Emotional states like anger, sadness, joy, and fear all produce characteristic (graded) prosodic cues that allow us to rapidly track these states in others (for a review, see Frühholz *et al.* 2016). It is then unsurprising that converging evidence from a variety of sources indicates that the tracking of speaker confidence through vocal pitch dynamics is supported by the same neural mechanisms responsible for processing speakers' emotional cues: EEG studies have observed neural time courses for the processing of speaker confidence consistent with those of other emotional vocal cues (Jiang and Pell 2015, 2016); hemodynamic activation during the processing of confident/unconfident utterances, especially in the superior temporal gyrus and inferior frontal gyrus (Jiang *et al.* 2017), closely matches that of other emotional vocal cues (see Frühholz *et al.* 2016); and neuropsychological observations from patients with right hemisphere damage (Pell 2007) as well as Parkinson's disease (Monetta *et al.* 2008) indicate that deficits in tracking the confidence of others via prosodic cues closely coincide with deficits in tracking emotional prosody. In short, when credences are tracked in this way, they are tracked just as we might expect were credence some variety of emotional state.

Before concluding, I want to make clear that here I've just assumed that there is no distinction to be made between tracking S's credence states and tracking S's feeling of confidence. As something like this credence-feeling distinction appears at least as far back as Ramsay (1926, 28), I want to say something on why I've chosen to forego it. While I will return in §4 to the question of whether credence and the feeling of confidence are distinct categories on actual mental ontology, the suggestion that our ToM systems track them like different states runs counter to the available evidence. Were this suggestion correct, we would expect that prosodically unmarked statements would demand fewer neural resources during the evaluation of speaker confidence, as, instead of tracking what are taken to be two distinct states (credence + the feeling of confidence), participants would only need to track one (credence). However, we observe the exact opposite. While S's confidence in her assertions can be rapidly and automatically tracked via prosodic cues, evaluating speaker confidence from unmarked assertions invokes much greater processing demands. As Jiang *et al.* conclude on the basis of evidence from both EEG and fMRI (2017, 3743–4), a 'prosodically unmarked voice reduces involuntary responses and places

top–down demands on the listener to uncover the implication of a nonexpressive voice', which illustrates that 'a time-consuming inference about the underlying sociopragmatic function of prosodically unmarked statements is required'. This is precisely what we should expect were credence itself tracked like an emotional state, which needs to be inferred from conversational context in the absence of direct cues of affective content.

All told, a wide variety of empirical evidence indicates that our ToM systems track credence as if it has an affective component. Credence states and states with affective content are (1) produced and tracked via the same sort of graded prosodic cues and (2) processed by comparable neurocognitive mechanisms, which (3) display correlated deficits. As we'll explore more now, this sharply contrasts with belief, which is often tracked as if it lacks any affective component.

III. BELIEF AND CREDENCE IN TOM-ONTOLOGY

In the previous section, I contrasted some of the key neurocognitive mechanisms supporting our ability to successfully attribute beliefs and credences to others. Now, I want to explore what these empirical differences between belief and credence tracking tell us about their respective places in the ontology of our ToM systems. Reserving any questions about actual mental ontology for the next section, our goal here is to understand whether ToM systems *track* beliefs and credences like they're distinct types of mental states. I of course think that they do, but unpacking precisely how the empirical evidence supports this claim is a bit tricky. Again, it's quite important to keep in mind that it isn't enough to simply observe that belief and credence tracking often relies on distinct neurocognitive mechanisms and associated perceptual cues—after all, we might trivially observe the same for what are uncontroversially single types (and even tokens) of mental states.[6] Nor do we have available to us the sort of direct evidence that might establish that credence states are sometimes attributed when belief states either are not or cannot be (or vice versa), as we have for knowledge and belief (see Bricker 2020; Phillips *et al.* 2021). Instead, my argument here will build from two main observations: (1) Credences are tracked using processes that are characteristic of the tracking of states with affective content. (2) Beliefs are tracked using processes that are uncharacteristic of the tracking of states with affective content. Taken together, credence states are tracked as having an affective component that belief states are tracked as lacking. While a dualist interpretation of ToM-ontology easily accommodates these observations, the monist alternative is much more problematic. Perhaps most importantly, as ToM-ontology takes credence states to have a

[6] Take, for example, a shriek and a grimace caused by a single pain state.

component that belief states lack, the option of a credence-first interpretation is straightforwardly excluded.

Let's begin with credences. Up to this point, I've made repeated reference to the idea that credence is tracked *as if it's an affective state* or *like it has an affective component*. By this, I mean that the prosodic tracking our ToM systems use for credence is characteristic of the tracking of states with affective content. As discussed in the previous section, not only are credence and other emotional states tracked using the same kinds of downstream cues closely associated with emotional states, but these cues are processed using similar neurocognitive mechanisms, which display correlated deficits. Moreover, just like an emotional state, the strength of credence states can be tracked even when representational content is not (e.g. in the case of pseudo-utterances). While of course fallible, all this clearly suggests that credence is tracked as we might expect were our ToM systems to identify it as having an affective component. It is difficult for me to imagine how one might object to this observation.

Conversely, belief is tracked like it lacks an affective component. Again, by this I mean that the perspectival tracking our ToM systems use for belief is uncharacteristic of the tracking of states with affective content. While it is at least conceivable that in some scenario S's emotional state might be tracked using perspectival cues upstream from S, that isn't generally how we track emotions. And if the empirical study of emotion tracking is any indication, such tracking is highly unusual. The mostly widely implemented paradigms used to investigate emotion tracking all utilize causally downstream cues, e.g. facial expressions, prosodic markers, and other behaviour caused by the tracked emotions (Bänziger 2014; Wilhelm *et al.* 2014; see e.g. Matsumoto *et al.* 2000; Baron-Cohen *et al.* 2001; Tracy and Robins 2008; Rosenberg *et al.* 2019). This is no accident or quirk of empirical research. There is a fundamental asymmetry between emotional and purely representational states with respect to how causally upstream cues map to potential mental states. For a purely representational state (e.g. simple visual perception), under ordinary circumstances, cues upstream to S are generally associated with only a single representational state that S could be in (i.e., seeing the cue). This allows us to attribute that bare representational state to S purely on the basis of causally upstream information. However, the states of affairs that cause emotions are generally consistent with a range of different possible emotional states. To take an example from the documentation for the CAVEAT (complex audio visual emotion assessment task) measure of emotion recognition, the upstream cue of water spilling on S is consistent with S being annoyed, but it is also just as consistent with S being angry or amused (Rosenberg *et al.* 2019, 235). Accordingly, to successfully track S's emotions, additional information is needed. An emotion-tracking system that operated only on upstream information just wouldn't be very good at tracking emotions, hence the characteristic reliance on downstream cues. In short, because upstream cues don't consistently map to determinate affective

content like they can map to determinate bare representational states, emotion tracking doesn't generally rely on upstream tracking modes. As belief tracking *does* utilize these kinds of mechanisms, we can observe that belief is tracked like it lacks an affective component—beliefs are tracked through processes uncharacteristic of the tracking of states with affective components.

Before moving on, I want to quickly consider an objection from sarcasm: Roughly, tracking a speaker's meaning, and therefore her belief states, on the basis of sarcastic or otherwise ironic speech notably involves processing prosodic cues (see e.g. Bryant 2010), which would then indicate, as with credence, that beliefs states can at least sometimes be partially composed by affective content. To defuse this concern, I would point out that sarcastic speech conveys far more than bare belief content. As discussed by Camp (2012, 589), sarcasm is often used as a tool for speakers wishing to be identified by others as occupying certain emotional states, specifically citing denial, hope, and scorn. Accordingly, we might understand that prosodic cues for sarcasm allow the speaker to convey—and the hearer to track—affective content not constitutive of beliefs but instead distinct emotional states.

All told, the available evidence indicates that credence, but not belief, is tracked as if it has an affective component. Let's now consider how both dualist and monist interpretations of ToM-ontology might account for this contrast. First, the dualist interpretation provides a straightforward framework on which to understand why credence—but not belief—is tracked like a state with an affective component: Our ToM systems operate using distinct belief and credence categories, taking them to be two separate types of mental states, with belief states composed of only a representational component and credence states composed of both representational and affective components. Conversely, on the monist interpretation, our ToM systems track beliefs and credences as a single type of mental state, which is characterized by a complex relation to affective content: Much of the time, being in this type of mental state is largely constituted by affective content, but much of the time being in this type of mental state is accompanied by no affective content.

I would suggest that, even at this point, the dualist ToM-ontology reads as the more natural option. Something about the monist interpretation seems a bit fishy. However, we can draw out this latent fishiness by simply asking ourselves what the single type of mental state is supposed to be here—a credence state (that beliefs reduce to) or a belief state (that credences reduce to)? First, we might note that the credence-first option is immediately incompatible with the supposition that credences have a component that beliefs lack. It's unclear how we might make sense of beliefs lacking any affective component but reducing to a type of state characterized largely by its affective component. Recall from §2 that both high and low credence states are tracked through cues characteristic of affective content, so it would be dubious to suggest that only credences too low to count as beliefs are tracked like emotions.

Accordingly, the credence-first option just isn't available to the ToM monist. However, the belief-first alternative doesn't fare all that much better. Here one does have the option to say that belief is more basic in the sense that the propositional content of credence states might reduce to that of belief, with credence states being composed of this belief component plus some additional affective component. However, while this is at least somewhat in keeping with the spirit of belief-first monism, it certainly doesn't mean that credences thereby *reduce* to belief, as there is still a component of credence states that goes beyond this representational content.[7] The proposal that credence is a belief state plus something else might still be considered belief-first, but it certainly isn't monism.

The point here is that the belief–credence monism interpretation of ToM-ontology just doesn't work for either a single credence state or a single belief state. As the affective component of credence states is different in category from the representational content that constitutes belief states, neither can reduce to the other. Instead, the monist interpretation requires something different than either of the monisms surveyed in section 1—a single state that is neither belief nor credence, roughly characterized by a representational component and a major but non-integral affective component, to which both belief and credence might reduce. Let's call this new state 'beliefence'. Whatever the precise details of beliefence might happen to be, if there is to be a viable monist interpretation of ToM-ontology, it will have to appeal to something along these lines.

This then brings us back to the central question of this section—do our ToM systems track belief and credence like one state or two? Although I'm not sure that I can definitively exclude the monist interpretation, I think it is clear that dualism is the preferable choice. While the dualist interpretation provides a straightforward, unproblematic framework for understanding the central differences in how our ToM systems track belief and credence states, beliefence monism is plagued by a number of issues. First, note that despite fulfilling the letter of belief–credence monism, beliefence monism abandons much of the spirit of extant monist positions. One of the characterizing features of belief–credence monisms is their ontological simplicity, allowing us to account for both belief and credence attitudes with the minimal number of mental states. Beliefence monism, in contrast, is something of a metaphysical monster, requiring us to posit an entirely new type of mental state, whose characteristics seem quite unlike other mental states presently in our conceptual arsenal. In so doing, the familiar frameworks provided by belief–credence monisms must too be abandoned. No longer might we say that one familiar mental

[7] It is worth mentioning that some accounts of emotion have taken emotional states to reduce to something like beliefs (e.g. Solomon 1976; Nussbaum 2001), which might then enable belief-first monism to accommodate the affective component of credences. However, as noted by Scarantino and de Sousa, this is not the case for "most of the dominant accounts in the philosophy of emotions" (2018, §7). Accordingly, I will not consider this option in detail here.

category reduces to another. Instead, they are unified in reducing to some new, previously undescribed type of mental state.

This brings us to the second, more significant issue with positing that ToM-ontology operates using the single category of beliefence states—there just isn't any evidence to suggest that there are beliefence states, either in ToM or actual mental ontology. While beliefence monism might work at a theoretical level, it's unclear why anyone would ever posit such an account apart from the desire to resist dualism on ToM-ontology. Any inclination towards this sort of *ad hoc* manoeuvring, however, would strike me as particularly odd, as one can be perfectly happy to grant that our ToM systems are dualists without conceding to dualism for actual mental ontology. As we'll see in the next section, it is by no means trivial to infer the nature of mental states from the ontology of the neurocognitive systems that track them. Rather than positing the new, strange, otherwise unmotivated category of beliefence all as a means to resist my argument, I think the more promising path of resistance is to maintain that ToM-ontology just gets mental ontology wrong here.

In short, at this point we can be quite confident that the dualist interpretation of ToM-ontology is preferable to that offered by monism, providing a straightforward way on which to understand the contrasting mechanisms of belief and credence attribution: Belief and credence are tracked like two distinct types of mental states, with belief composed of only a representational component and credence composed of both representational and affective components.

IV. BELIEF AND CREDENCE ON ACTUAL MENTAL ONTOLOGY

Up to this point, we've been primarily concerned with questions related to the ToM systems that allow us to track the mental states of others—how do ToM systems track beliefs and credences differently, and what is the best way to interpret the mental ontology applied by these systems? Now, I want to return to the central question of this paper, which is not one simply of ToM-ontology, but actual mental ontology—are beliefs and credences two distinct types of mental states? Here I'll defend the position that they are. In this specific case, our ToM systems seem to get it right, picking out a genuine affective component of credence that is absent for belief. We see this reflected in asymmetries in how we talk about the belief and confidence of others, with talk of confidence mirroring talk of other affective states in ways that talk of belief does not. We might further observe that this also matches our introspective judgements about the feeling of confidence and its relationship with belief. All told, even if one is generally wary of the inference from ToM-ontology to actual mental ontology (e.g. in the case of knowledge), here it seems perfectly benign. A suite of considerations all indicate that credence has an

affective component while belief does not. While I would stop short of making any definitive conclusions on this basis alone, the observation that beliefs and credences likely differ in their composition converges with evidence that they play differing functional roles (Ross and Schroeder 2014; Friedman 2019) and are cognitively distinct (Weisberg 2020), further strengthening the overall case for belief–credence dualism.

To start, one way we might argue that ToM-ontology gets things right here is through an appeal to the broader claim that ToM-ontology is generally a reliable guide to actual mental ontology. While Nagel has notably advanced this position by suggesting that we adopt a 'non-skeptical attitude' towards ToM-ontology (2013, 303), here I want to consider how we might employ the principle of neurocognitive parity (Bricker 2021) to do this work. Originally formulated with the metaphysical composition of knowledge in mind, neurocognitive parity is an '*if what, then how* principle' (Bricker 2021, 11; original emphasis) for mental state attribution. That is, if what our ToM systems tell us in a specific case (Does S know? Believe? Have credence c?) is indicative of the metaphysical composition of the target state, so too is how those judgements form. As here we're talking about foundational, unproblematic ToM processes responsible for a large proportion of our judgements about belief and credence, and, as with knowledge, it is entirely ordinary to expect what we judge in cases of belief and credence to be indicative of their metaphysical compositions,[8] we can then apply neurocognitive parity to conclude that *how* beliefs and credences are attributed is also indicative of their respective metaphysical compositions. In short, if one agrees that the mental ontology applied by our ToM systems is generally correct, whether because of neurocognitive parity or some other rationale, then it follows that belief–credence dualism is directly supported by the observations of the previous two sections. I recognize, however, that many are likely to find this sort of move unconvincing, and for that reason I've opted to showcase a more conservative argument here. The idea is that, even if you generally want to resist the move from ToM-ontology to actual mental ontology, we have good reason to think that, in this specific case, ToM-ontology is on to something.

An important indication that our ToM systems are in fact picking out a genuine affective component of credence states, which isn't present in belief states, comes from the significant asymmetry in how we ordinarily talk about the beliefs and credences of others. There are at least three identifiable dimensions to this asymmetry (see Table 1 for a summary). First, as with mental states uncontroversially composed of an affective component, we readily describe others' confidence that p as if it's a *feeling*, using verbs like 'is', 'feels', 'sounds', and 'looks' together with a mental state adjective. It is perfectly ordinary to say something like, 'Alex is/feels/sounds/looks confident that she is winning the

[8] For a discussion of a large number of examples, see Jackson (2021).

Table 1 Summary of differences in how we talk about credence and belief states, with excitement and knowledge included as states that display similar syntactic profiles in English. [Brackets] illustrate mental state adjectives absent in English.

	Credence	(e.g.) Excitement	Belief	(e.g.) Knowledge
Feelings	S feels confident that p.	S feels excited that p.	*S feels [think-y] that p.	*S feels [know-y] that p.
Moods	S sounds confident.	S sounds excited.	*S sounds [think-y].	*S sounds [know-y] that p.
Verbs	*S credences that p.	*S excites that p.	S thinks that p.	S knows that p.

chess tournament', just as we might for Alex being/feeling/sounding/looking excited (or relieved, or surprised, etc.) that she is winning. In contrast, belief states cannot be expressed via this 'feeling' syntax. At least in English, there simply isn't a natural way to say that S is/feels/sounds/looks belief-y or think-y that p. The closest option might be 'believable', but this expresses something else entirely, not the property of being in a belief state but of being/appearing trustworthy.[9] In this respect, belief is much closer to something like knowledge than it is a state with an affective component. Next, a second, related asymmetry comes from our ability to talk about the confidence of others as a *mood*, with affective content absent any intentional object. We can and often do say things like 'S is/feels/sounds/looks confident', just as we might for any other mood. It's perfectly intelligible to say that S just feels confident in a general sense, without that confidence being directed at any specific intentional object. This too contrasts with belief, as it is simply unintelligible to talk about S being in a belief state with no representational content. Finally, we might observe that belief is easily expressed using mental state verbs like 'thinks' and 'believes', while credence—as with many states with affective content—lacks a dedicated mental state verb.[10] Much like we cannot naturally say that S excites (or relieves, or surprises, etc.) that p, we cannot say that S credences or confidences that p.

Additionally, we might further observe that none of this seems especially odd or inconsistent with our own introspective judgements about what it's like to be in a credence state. On the contrary, I would submit that, upon introspection, we readily find that there is something to the idea that credence has a significant affective component, a component which appears to grow stronger in magnitude the closer one gets to maximal or minimal confidence.

[9] Additionally, 'S is/feels/sounds/looks believable *that p*' is still unnatural in English.

[10] This isn't a perfect asymmetry, as states like hope and fear do have their own mental state verbs, but the point stands that the absence of a dedicated mental state verb is often associated with states that we in some way feel.

For example, imagine that you're a student about to sit down for an exam, and that your confidence that you'll pass is quite low. That doubt feels a certain way, with a phenomenological character we might distinguish from the dread of the undesirable consequences of failing and cacophony of other negative emotions one might be feeling. Or, imagine instead that going in you're near-maximally confident that you're going to ace the exam. That state of confidence feels a certain way too. Again, while it might coincide with other affective states, like excitement or calm or even pride, we can clearly separate out the feeling of confidence from any such coincident states. We might observe further that while this state of confidence is to some degree correlated with the belief that one will ace the exam, this belief itself doesn't seem to entail any feeling of confidence. At least conceptually, we can easily imagine ourselves to believe that we'll ace the exam in isolation from the feeling of confidence. There doesn't seem to be anything defective, or even abnormal, with a statement like, 'I'm not feeling especially confident, but, at least intellectually, I do think that I'll do well on the exam'. In such a case, we can easily imagine the speaker's mental state. While I'm not sure that this sort of observation is itself sufficient to motivate belief–credence dualism, that's not really the point. Rather, the point here is that our introspective judgements about what it's like to be confident are, at a minimum, consistent with the proposal that there is indeed a feeling associated with confidence, a feeling which isn't in the same way associated with belief.

These asymmetries in how we talk and think about beliefs and credences are precisely what we would expect if ToM-ontology indeed picked out a genuine difference in affective content separating belief and credence states. We have especially strong evidence for the proposal that there is an affective component to credence states—not only do credence states produce prosodic cues associated with affective content, which our brains track like affective content, but we also talk and think about credence states as if they have a significant affective component.

At this point, I think the weaker feature of ToM-ontology is the idea that belief states lack any significant affective component. While this too is consistent with the way in which we talk and think about beliefs, it could be that our neurocognitive systems, the English language, and our introspective judgements are jointly missing something. Recall too that that evidence from Buckwalter *et al.* (2015) suggests that discrete, affectless belief (entailed by knowledge) is distinct from graded, affect-laden belief (not entailed by knowledge). Nevertheless, it could still be that we're all missing some tricky-to-spot affective dimension to belief.[11] To dispel this worry a bit further, I would point out that

[11] Note further that, as here we focused on only very simple cases of belief tracking, we cannot rule out the possibility that more complex belief tracking might sometimes utilize cues of affective content. I'm thankful to an anonymous reviewer for raising this point.

the most obvious candidate for the affective component of belief, the 'seizing' and 'freezing' associated with our desire for settled beliefs and cognitive closure (see Kruglanski and Webster 1996), is best understood not as a component of belief itself, but rather as a transient affective state that sometimes accompanies belief formation and revision. While there may in certain cases be some positive affect that coincides with the formation of a full, settled belief, this affect is not a permanent fixture of the belief itself. As put by Weisberg, 'cognitive closure is the *formation* of a full belief' (2020, 14; emphasis added). In short, if there is an affective component to belief, we'll have to look elsewhere.

Additionally, one might also worry that ToM-ontology is mistaken in conflating the feeling of confidence with credence states themselves, perhaps maintaining that the credences responsible for explaining action are distinct from any associated affective states. While I cannot conclusively eliminate this worry, I do think it's less compelling than it might appear. Crucially, the ceteris paribus preference for ontological simplicity, a central motivation behind belief–credence monism, counts quite clearly in favour of the identification of credences with the feeling of confidence. Although here we've found evidence favouring the classification of beliefs and credences as separate types of mental states, I would suggest that we have no such reason for doing so in the case of credence vs. the feeling of confidence. Not only are they tightly correlated, with our ToM systems tracking them like a single state, but we have little reason to doubt that a graded emotional state with propositional content as its intentional object can be causally efficacious in the way expected of credences. Perhaps one might object, following Ramsey (1926, 28), that introspection indicates that we frequently have states that play the causal role of credences absent any feeling of confidence. I'm not sure that I would agree with such an assessment. However, supposing it's correct, I'd note that it is unlikely that affective content is always accessible to introspection. Both psychologists (see e.g. Winkielman and Berridge 2004) and philosophers (Jäger 2009; although see also Hatzimoysis 2007) have argued that affective content is frequently inaccessible upon reflection. Unfortunately, here we'll have to leave open the empirical question of the extent to which the affective component of S's credences might not be salient to S. Nevertheless, in observing that affective content need not be conscious, we might avoid the worry that observing causally efficacious credence states with no affective content obvious upon introspection compels us to conclude that credences are distinct from the feeling of confidence.

In short, the evidence currently available to us indicates that our ToM systems identify a genuine affective component of credence, which these systems correctly take to be absent in belief. As this asymmetry is also present in both ordinary language and our introspective judgements about belief and credence, we can conclude that a suite of considerations all suggest that beliefs and credences are distinct types of mental states. To be clear, because

this conclusion follows from a largely empirical argument, it is of course subject to revision pending new findings, and we cannot rule out the possibility that future research might identify an affective component for belief as well. However, at this point we might observe that this conclusion that belief and credence have distinct metaphysical compositions converges with independent arguments that belief and credence play distinct functional roles (Ross and Schroeder 2014; Friedman 2019), are distinct at the level of the cognitive processes that support them (Weisberg 2020), and are largely functionally independent (Jackson 2021). In this manner, we might understand the argument I've presented here as one member of a group of recent arguments all pointing in the same direction—belief and credence are two distinct types of mental states, with neither reducing to the other.

V. CONCLUSION: WHERE DOES THIS LEAVE THE DUALISM DEBATE?

Here I've argued that our ToM systems pick out a genuine affective component in credence states that appears to be absent in belief states, thereby providing a new line of evidence that these are distinct types of mental states. As mentioned earlier, one way to over-interpret this argument would be to take it to be conclusive. Especially since we cannot fully eliminate the possibility that ToM systems, the English language, and our introspective judgements have jointly overlooked some sneaky affective component of belief states, this sort of empirical argument is subject to revision pending future findings. However, I want to close with a word of warning against a second way in which one might over-interpret the argument I've presented here. Unlike other arguments for dualism (e.g. Pettigrew 2015; Friedman 2019; Jackson 2019; Weisberg 2020), mine doesn't have any direct implications for the representational components of belief and credence. Just going off of the evidence I've surveyed here, it could still be that the representational component of belief reduces to credence, or vice versa. For example, while no longer thereby fully reducing belief to credence, a credence-first theorist might still say that belief is just some level of credence minus the affective component. While I'm not sure how compelling I find this move myself, this type of partial reduction is certainly compatible with my account, allowing the monist to preserve much of the doxastic profile of belief–credence monism.

In this way, while my account does constrain the scope of the belief–credence debate—narrowing questions of state reduction to representational content reduction—it does nothing to settle these questions outright. Instead, the more important point here, which has gone largely overlooked in recent discussions of belief and credence, is that credence has a major affective component.

Confidence is not merely a representational state. Confidence is something we feel. Belief is not. Accordingly, neither can fully reduce to the other.

FUNDING

Portions of this research have been supported by both Academy of Finland postdoctoral grant no. 339681 and Sven Bernecker's Alexander von Humboldt Professor grant.

ACKNOWLEDGEMENT

I'd like to thank everyone at CONCEPT for their valuable input on this paper, especially Sven Bernecker, Stefanie Grüne, Sophia Bokros, Luis Rosa, and Paul Silva. I'm also thankful for comments from two anonymous reviewers, whose remarks have significantly improved the paper.

REFERENCES

Baron-Cohen, S. *et al.* (2001) 'The "Reading the Mind in the Eyes" Test Revised Version: A Study with Normal Adults, and Adults with Asperger Syndrome or High-functioning Autism', *Journal of Child Psychology and Psychiatry*, 42: 241–51.

Bänziger, T. (2014) 'Measuring Emotion Recognition Ability', in A. C. Michalos (ed.) *Encyclopedia of Quality of Life and Well-Being Research*. Dordrecht: Springer.

Bricker, A. M. (2020) 'The Neural and Cognitive Mechanisms of Knowledge Attribution: An EEG Study', *Cognition*, 203: 104412.

——— (2021) 'Knowledge is a Mental State (At Least Sometimes)', *Philosophical Studies*.

Bryant, G. A. (2010) 'Prosodic Contrasts in Ironic Speech', *Discourse Processes*, 47: 545–66.

Buckwalter, R., Rose, D. and Turri, J. (2015) 'Belief through Thick and Thin', *Noûs*, 49: 748–75.

Call, J. and Tomasello, M. (1999) 'A Nonverbal False Belief Task: The Performance of Children and Great Apes', *Child Development*, 70: 381–95.

Camp, E. (2012) 'Sarcasm, Pretense, and The Semantics/Pragmatics Distinction', *Noûs*, 46: 587–634.

Clarke, R. (2013) 'Belief is Credence One (In Context)', *Philosophers' Imprint*, 13: 1–18.

Dodd, D. (2017) 'Belief and Certainty', *Synthese*, 194: 4597–621.

Dorst, K. (2019) 'Lockeans Maximize Expected Accuracy', *Mind*, 128: 175–211.

Fabricius, B. *et al.* (2010) 'True or False: Do 5-Year-Olds Understand Belief?', *Developmental Psychology*, 46: 1402–16.

Flavell, J. H. *et al.* (1981) 'Young Children's Knowledge about Visual Perception: Further Evidence for the Level 1–Level 2 Distinction', *Developmental Psychology*, 17: 99–103.

Foley, R. (2009) 'Beliefs, Degrees of Belief, and the Lockean Thesis', in Franz Huber and Christoph Schmidt-Petri (eds) *Degrees of Belief*. Netherlands: Springer.

Friedman, J. (2019) 'Inquiry and Belief', *Noûs*, 53: 296–315.

Frühholz, S., Trost, W. and Kotz, S. (2016) 'The sound of emotions—Towards a unifying neural network perspective of affective sound processing', *Neuroscience & Biobehavioral Reviews*, 68: 96–110.

Goldman, A. (1976) 'Discrimination and Perceptual Knowledge', *J. Philos.*, 73: 771–91.

Greco, D. (2015) 'How I Learned to Stop Worrying and Love Probability 1', *Philosophical Perspectives*, 29: 179–201.

Hatzimoysis, A. (2007) 'The Case Against Unconscious Emotions', *Analysis*, 67: 292–9.
Heleven, E. and Van Overwalle, F. (2018) 'The Neural Basis of Representing Others' Inner States', *Current Opinion in Psychology*, 23: 98–103.
Jackson, E. (2019) *Belief and Credence: A Defense of Dualism. Dissertation*, University of Notre Dame.
——— (2020) 'The Relationship Between Belief and Credence', *Philosophy Compass*, 15.
——— (2021) 'On the Independence of Belief and Credence', *Philosophical Issues*.
Jäger, C. (2009) 'Affective Ignorance', *Erkenn*, 71: 123–39.
Jiang, X. and Pell, M. (2015) 'On how the Brain Decodes Vocal Cues About Speaker Confidence', *Cortex*, 66: 9–34.
——— (2016) 'Neural Responses Towards A Speaker's Feeling of (un)knowing', *Neuropsychologia*, 81: 79–93.
——— (2017) 'The Sound of Confidence and Doubt', *Speech Communication*, 88: 106–26.
Jiang, X., Sanford, R. and Pell, M. (2017) 'Neural Systems for Evaluating Speaker (Un)believability', *Human Brain Mapping*, 38: 3732–49.
Kaminski, C., Call, J. and Tomasello, M. (2008) 'Chimpanzees Know What Others Know, But not What They Believe', *Cognition*, 109: 224–34.
Kauss, D. (2020) 'Credence as Doxastic Tendency', *Synthese*, 197: 4495–518.
Kruglanski, W. and Webster, D. (1996) 'Motivated Closing of the Mind: "Seizing" and "Freezing."', *Psychological Review*, 103: 263–83.
Kuhlen, A. K. *et al.* (2015) 'Neural Coding of Assessing Another Person's Knowledge Based on Nonverbal Cues', *Social Cognitive and Affective Neuroscience*, 10: 729–34.
Lee, M. (2017) 'Credence and Correctness: In Defense of Credal Reductivism', *Philosophical Papers*, 46: 273–96.
Mahy, C., Moses, L. and Pfeifer, J. (2014) 'How and Where: Theory-of-Mind in the Brain', *Developmental Cognitive Neuroscience*, 9: 68–81.
Masangkay, Z. *et al.* (1974) 'The Early Development of Inferences about the Visual Percepts of Others', *Child Development*, 45: 357–66.
Matsumoto, D. *et al.* (2000) 'A New Test to Measure Emotion Recognition Ability: Matsumoto and Ekman's Japanese and Caucasian Brief Affect Recognition Test (JACBART)', *Journal of Nonverbal Behavior*, 24: 179–209.
Moll, H. and Tomasello, M. (2006) 'Level I Perspective-Taking at 24 Months of Age', *British Journal of Developmental Psychology*, 24: 603–13.
Monetta, L., Cheang, H. S. and Pell, M. D. (2008) 'Understanding Speaker Attitudes from Prosody by Adults with Parkinson's Disease', *Journal of Neuropsychology*, 2: 415–30.
Moon, A. and Jackson, E. (2020) 'Credence: A Belief-First Approach', *Canadian Journal of Philosophy*, 50: 652–69.
Nagel, J. (2013) 'Knowledge as a Mental State', in Tamar Szabó Gendler and John Hawthorne (eds) *Oxford studies in epistemology volume 4*, 273–308. Oxford: Oxford University Press.
Nussbaum, M. (2001) *Upheavals of thought: The intelligence of emotions*. Cambridge: Cambridge University Press.
Özdem, C. *et al.* (2019) 'The Neural Representation of Mental Beliefs Held by two Agents', *Cognitive, Affective, & Behavioral Neuroscience*, 19: 1433–43.
Pell, M. (2007) 'Reduced Sensitivity to Prosodic Attitudes in Adults with Focal Right Hemisphere Brain Damage', *Brain Lang.*, 101: 64–79.
Pettigrew, R. (2015) 'Pluralism about Belief States', *Aristotelian Society Supplementary Volume*, 89: 187–204.
Phillips, J. *et al.* (2021) 'Knowledge Before Belief'. *Behavioral and Brain Sciences*, 44: e140–.
Ramsey, F. (1926/2016) 'Truth and Probability', in H. Arló-Costa *et al.* (eds) *Readings in Formal Epistemology*. London: Springer.
Rosenberg, H. *et al.* (2019) 'Measuring Emotion Perception Following Traumatic Brain Injury: The Complex Audio Visual Emotion Assessment Task (CAVEAT)', *Neuropsychological Rehabilitation*, 29: 232–50.
Ross, J. and Schroeder, M. (2014) 'Belief, Credence, and Pragmatic Encroachment', *Philosophy and Phenomenological Research*, 88: 259–88.
Russell, B. (1948) *Human Knowledge: Its Scope and Limits*. New York: Simon and Schuster.
Samson, D. *et al.* (2004) 'Left Temporoparietal Junction is Necessary for Representing Someone Else's Belief', *Nature Neuroscience*, 7:

——— (2005) 'Seeing it My Way: A Case of a Selective Deficit in Inhibiting Self-Perspective', *Brain*, 128: 1102–11.
——— (2010) 'Seeing it Their Way: Evidence for Rapid and Involuntary Computation of what Other People See. Journal of Experimental Psychology', *Journal of Experimental Psychology: Human Perception and Performance*, 36: 1255–66.
Samson, D., Apperly, I. A. and Humphreys, G. W. (2007) 'Error Analyses Reveal Contrasting Deficits in "Theory of Mind": Neuropsychological Evidence from a 3-Option False Belief Task', *Neuropsychologia*, 45: 2561–9.
Samuel, H. *et al.* (2021) 'Visual Perspective-Taking and Image-Like Representations: We Don't See It', *Cognition*, 210: 104607.
Scarantino, A. and de Sousa, R. (2018) 'Emotion', in E. N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy* (Winter 2018 Edition), https://plato.stanford.edu/archives/win2018/entries/emotion/>.
Schurz, M. *et al.* (2013) 'Common Brain Areas Engaged in False Belief Reasoning and Visual Perspective Taking: A Meta-Analysis of Functional Brain Imaging Studies', *Frontiers in Human Neuroscience*, 7: 712.
Schurz, M. *et al.* (2015) 'Clarifying the Role of Theory of Mind Areas During Visual Perspective Taking: Issues of Spontaneity and Domain-Specificity', *Neuroimage*, 117: 386–96.
Schuwerk, T. *et al.* (2014) 'Functional Activity and Effective Connectivity of the Posterior Medial Prefrontal Cortex During Processing of Incongruent Mental States', *Hum. Brain Mapp.*, 35: 2950–65.
Solomon, R. (1976) *The Passions*. New York: Doubleday.
Sturgeon, S. (2008) 'Reason and the Grain of Belief', *Nous*, 42: 139–65.
Surtees, A. and Apperly, I. (2012) 'Egocentrism and Automatic Perspective Taking in Children and Adults', *Child Development*, 83: 452–60.
Surtees, A., Apperly, I. and Samson, D. (2013) 'Similarities and Differences in Visual and Spatial Perspective-Taking Processes', *Cognition*, 129: 426–38.
Tracy, J. and Robins, R. W. (2008) 'The Automaticity of Emotion Recognition', *Emotion*, 8: 81–95.
van Der Meer, L. N. A. *et al.* (2011) 'Inhibit Yourself and Understand the Other: Neural Basis of Distinct Processes Underlying Theory of Mind', *Neuroimage*, 56: 2364–74.
van Fraassen, B. (1995) 'Fine-Grained Opinion, Probability, and the Logic of Full Belief', *Journal of Philosophical Logic*, 24: 349–77.
Weisberg, J. (2020) 'Belief in Psyontology', *Philosophers' Imprint*, 20: 1–27.
Wilhelm, O. *et al.* (2014) 'Test Battery for Measuring the Perception and Recognition of Facial Expressions of Emotion', *Frontiers in Psychology*, 5.
Winkielman, P. and Berridge, K. C. (2004) 'Unconscious Emotion', *Current Directions in Psychological Science*, 13: 120–3.

Turku Brain and Mind Center, University of Turku, Finland