

[Pre-publication draft of a paper to appear in the *Philosophical Quarterly*. Please refer to the journal's website for the final version, to be used for citations/references].

## **A Fitting Definition of Epistemic Emotions**

Abstract: *Philosophers and psychologists sometimes categorize emotions like surprise and curiosity as specifically epistemic. Is there some reasonably unified and interesting class of emotions here? If so, what unifies it? This paper proposes and defends an evaluative account of epistemic emotions: what it is to be an epistemic emotion is to have fittingness conditions that distinctively involve some epistemic evaluation. We argue that this view has significant advantages over alternative proposals and is a promising way to identify a limited and interesting class of emotions.*

**Keywords:** epistemic emotions, surprise, fittingness, expectations, puzzlement.

Mike Deigan (Freie Universität Berlin)

Juan S. Piñeros Glasscock (Georgia State University)<sup>1</sup>

## **A Fitting Definition of Epistemic Emotions**

Words: 7,337 (9,382 with footnotes)

There seems to be a class of specifically moral emotions. Guilt, resentment, indignation, and perhaps other emotions seem to share something to do with moral normativity that sets them apart from fear, sadness, anxiety, surprise, annoyance, and so on. Ethicists, political philosophers, and psychologists have long used this category for various theoretical ends. But what exactly makes an emotion a moral emotion? We take this question to be interesting both for its own sake and as an aid to evaluating its potential applications.

Similarly, there seems to be a class of specifically epistemic emotions. Surprise, puzzlement, curiosity, and perhaps other emotions seem to share something to do with epistemic normativity that sets them apart from fear, sadness, anxiety, annoyance, guilt, resentment, and so on. Epistemologists and psychologists are starting to use this category for various theoretical ends.<sup>2</sup> But what exactly makes an emotion an epistemic emotion? Like the question about moral emotions, we take this to be interesting both for its own sake and as an aid to evaluating its potential applications. Of course, even if this is an interesting question, there is no guarantee that there will be an interesting answer; and skeptical worries have been raised against the possibility of delineating any interesting category of the sort (Meylan 2014). In this paper we present a new

---

<sup>1</sup> Both authors contributed equally to this project.

<sup>2</sup> See Stocker (2004), Brun and Kuenzle (2008), de Sousa (2009), Morton (2010), Dokic (2012), Goldie (2012), Brady (2013, 2018), Arango-Muñoz and Michaelian (2014), Meylan (2014), Tollefsen (2017), Carruthers (2017), Candiotta (2020), Vogl (2019, 2020).

answer to the question, one yielding a principled categorization with an intuitively correct extension.

The most plausible candidate epistemic emotions all play important roles in inquiry, for instance, motivating us to seek knowledge, guiding our attention so that we inquire well, and so on. A natural approach to defining what it is to be an epistemic emotion is therefore in terms of these roles: roughly, epistemic emotions are those that are instrumental to epistemic success. Adam Morton (2010) has developed an account along these lines that has been highly influential. However, we shall argue that it is flawed. It does not single out an interestingly unified and limited class of epistemic emotions (Section 1). We then propose and defend an alternative that we think fares better in this and other regards (Sections 2 and 3).

Our alternative develops a line of thought inspired by what we believe is the most promising way to demarcate moral emotions. On this view, what distinguishes these categories are their fittingness conditions: roughly, just as moral emotions are those that have morally evaluative fittingness conditions, epistemic emotions are those that have epistemically evaluative fittingness conditions.<sup>3</sup> As we shall see, working out this idea requires some finesse. On the one hand, it needs to be developed in a way that is more constrained than Morton's definition. On the other, it needs to avoid the opposite problem that Anne Meylan (2014) has posed, namely, that the definition doesn't apply to any of the usual candidate epistemic emotions. Our account, we argue, manages to avoid both problems, vindicating the idea that surprise and puzzlement are epistemic emotions, but fear, guilt, and worry are not, even when they happen to concern or promote epistemic aims.

---

<sup>3</sup> Various proposed definitions of moral emotions have given a central place to moral evaluations (Broad 1946, p. 114; Rawls 1999, p. 421; Ben-Ze'ev 2007; Roeser 2011, p. 149), though the details differ from each other and from our favored approach. Other philosophers and psychologists have attempted to circumscribe the moral emotions in other ways. For instance, many follow Haidt (2003) in taking moral emotions to be "those emotions that are linked to the interests or welfare either of society as a whole or at least of persons other than the judge or agent" (p. 853). We take definitions along these lines to face problems similar to those we raise for Morton's definition of epistemic emotions.

We close by discussing some potential implications for future research both in philosophy and empirical disciplines (Section 4).

### *1. Morton's Account and Trivial Worries*

Our concern to find an elucidative definition of epistemic emotions is shared by Adam Morton (2010), who presents the following account in his pioneering piece on the subject:

**Morton's Account 1 (MA1):** *e* is an epistemic emotion iff *e* is an emotion required for epistemic success.

Though in passing Morton suggests an alternative (which we shall consider below), this seems to be his considered view.<sup>4</sup> We shall argue that it is inadequate.

What counts as an inadequacy in a proposed definition can depend on one's aims and background metaphysical assumptions. One might demand that a definition carve nature at the mind-independent joints, for example, or appeal only to some restricted set of primitive notions. But our criticisms are intended to be neutral with respect to most of these metaphilosophical differences. We assume, for instance, that if there's a sensible class of epistemic emotions worth defining, then it will not be trivially inclusive, including practically all emotion types. Before coming to our own criticisms, let us start by considering two preliminary worries to clarify the nature of Morton's aim (and ours).

The first worry is that the definition is circular because it aims to define an epistemic notion—epistemic emotions—but the definiens appeals to the notion of *epistemic success*. This worry seems to us misguided, because the aim of the project is not to define what the epistemic is,

---

<sup>4</sup> Morton's argument for the existence of epistemic emotions begins by noting that certain emotions seem important to carry out epistemic tasks like inquiry (pp. 398-391), but he thinks this is not sufficient to establish the existence of such emotions since "the absence of epistemic emotion seems to make things harder rather than impossible" (p.291). He goes on to argue that emotions like epistemic worry, concern, and dissatisfaction are epistemic, since "we could not manage [epistemic] projects without [them]" (p.393), so that inquiry "is impossible for us unless we are prompted, pushed, and goaded by epistemic emotions such as worry, fascination, and curiosity" (p.394).

but rather to see if the category of the epistemic leaves room for anything like epistemic emotions. And there is certainly an intuitive understanding of what epistemic success is, namely achieving states like knowledge, justification, understanding, and so on. So long as the definition doesn't evidently clash with this intuitive understanding, it is fair game to rely on it as part of a definition of epistemic emotions.

A related worry is that reasonable differences in our understanding of epistemic success shall result in an underspecified definition. We do not find this troubling in itself, however. The definition may well classify emotions differently depending on one's other theoretical commitments, but this is as it should be. 'Bachelor' may be defined as unmarried male' even if the notions unmarried and male are vague and contentious. We think Morton's definition does in fact produce implausible results, but not in a way that depends on a specific understanding of epistemic success.

The trouble for Morton's definition begins not with the question "What is epistemic success?" but instead "Required for whom?". Suppose that if John were to cease being afraid of his department head he would be unable to carry out philosophical inquiry and attain epistemic success, whatever exactly that amounts to. Would that make fear an epistemic emotion? Clearly not. So it can't be that an emotion is epistemic if some particular person happens to need it for epistemic success. Perhaps, then, the requirement is meant to hold for all humans. This still seems overly chauvinistic: what if curiosity was epistemically indispensable for humans, but dispensable for aliens? More importantly, it is implausible to think that there is any particular emotion that all humans (never mind all beings) need in order to successfully conduct epistemic activities. Take one of Morton's favorite examples: curiosity. Imagine a human incapable of feeling curious, but who was otherwise extremely gifted at certain epistemic tasks, such as comprehending difficult

ideas and seeing connections that others don't. Is it plausible that she could not perform (well or at all) as an epistemic agent? We doubt this. There could be a scholar who produces excellent research but is only motivated by non-epistemic features such as money and fame, but never by curiosity.<sup>5</sup> So it does not seem plausible to hold that epistemic indispensability is a necessary condition for counting as an epistemic emotion.<sup>6</sup> MA1 is thus too restrictive.

In other ways, however, MA1 is too permissive. Suppose that no person could successfully conduct inquiry without some degree of happiness, since a completely depressed person could not motivate herself to do any task successfully, including epistemic tasks. Would that mean that happiness is an epistemic emotion? Clearly not.<sup>7</sup>

These issues, we suggest, stem from a deeper problem with the view, which is that indispensability (however specified) is the wrong kind of feature to define a philosophically interesting category of emotions. To see this, consider emotions that are in some sense indispensable for success at boardgames, or at medical tasks: perhaps good gamers must have a zeal for victory, and perhaps good doctors must feel some sympathy towards their patients. Would that mean that in addition to recognizing a category of epistemic emotions we should also

---

<sup>5</sup> Compare the case of Frank Borman II, the commander of the Apollo mission that first flew around the moon. In an interview for *This American Life* ("The Not-So-Great Unknown" 2018), Borman claims that he never had the sightless interest or curiosity about space. Asked whether he was ever interested "to seek out new life and new civilizations, to go boldly where no one has gone before", he replies, "Nonsense to me. I-- it doesn't interest me. I'm sorry." He claims to have entered the mission solely to help the U.S. win the Space Race.

<sup>6</sup> Synthesizing substantial research from cognitive science and AI research, Nagel (forthcoming) has recently argued that curiosity, understood as a non-instrumental desire for knowledge, plays a crucial role in human and other animal's intellectual development. As Nagel observes, however, instrumentally motivated learning (by factors like hunger) "could be enough to support even quite complex intelligent behaviors through secondary reinforcement" (p.10). Furthermore, Nagel's concern is with the developmental question of the type of cognitive make-up a creature needs to develop into a system with a complex intelligence, rather than with the question of epistemic achievements in distinct domains. Morton's definition could not be helped by appeal to the former, since *non*-epistemic emotions are clearly essential for the development of intelligent creatures. After all, without fear an infant would have essentially null chances of survival.

<sup>7</sup> We take similar considerations to speak against a generic version of MA1, to the effect that epistemic emotions are those that are *generally* required for epistemic inquiry. Moreover, as a reviewer pointed out, many influential accounts of emotions (e.g. de Sousa 1990) hold that emotions in general are necessary to narrow the space of possibilities as a condition to perform any task whatsoever, including epistemic tasks.

recognize a category of boardgame and medical emotions (and, so, emotions relating to any kind of human endeavor)? If we did so, the myriad categories thus defined would not be of much philosophical interest. There may be some purposes for which using such categorizations are sensible, but we take the categories of moral emotions and epistemic emotions to be capturing something deeper.<sup>8</sup>

Morton offers another, non-equivalent proposal:

**Morton's Account 2 (MA2):** *e* is an epistemic emotion iff *e* is an emotion “specifically directed at epistemic ends” (p.386).

That is, an emotion that has some epistemic matter as its object is, on this account, thereby an epistemic emotion. Morton gives *epistemic worry* as an example of an emotion that counts as epistemic under this definition (pp.393-4). On his account, epistemic worry is directed at, roughly, the end of ensuring that all the relevant epistemic alternatives are properly considered in the course of inquiry. For instance, a researcher tasked with determining whether there are carcinogens on bottles “will remain alert for chemical processes involving the carcinogen and its precursors. She will notice them when they arise in the course of other considerations, and she will try to imagine possible such processes” (p.394). Morton contends that for these factors to appropriately affect our researcher, she must be worried by them: “the worry has to work on her as an epistemic motive. It has to nag” (ib.).

Morton, in our view, is right to think that emotions like worry play a crucial role in inquiry when they are directed to epistemic objects. However, defining epistemic emotions in terms of this feature gives rise to problems similar to those already discussed for MA1. First, the proposal yields implausible results. For instance, a researcher might suffer from imposter syndrome. The

---

<sup>8</sup> Our objection is inspired by Anscombe's famous ‘mince-pie syllogism’ worry about defining practical reasoning just in terms of its content (Anscombe 1957, p. 58).

resulting fear at being discovered might direct and motivate him to pursue excellent research. But such fear is not an epistemic emotion any more than fear of losing customers is a moral emotion, even if such fear motivates one to do one's duty. Or, again, one might feel guilty about not knowing a fact (about one's lover or a country's history), and that guilt might direct one to research the matter. But such guilt is not an epistemic emotion, any more than surprise about someone's viciousness is a moral emotion. Second, categorizing emotions by their objects also yields an unattractively proliferating classification scheme. Consider *Trivial worries*, worries directed at the end of considering all the relevant alternatives one need consider to succeed at *Trivial Pursuit*. Suppose Ann is playing a difficult version of *Trivial Pursuit* that includes many difficult questions, questions that people are likely to get wrong if they go with their first gut instinct. We could imagine that for this reason people in general won't succeed at this game unless they are appropriately gripped by worries about which answers are correct and which are tricky decoys. Once again, though, we take it that the class of Trivial worries lives up to its name, and is not philosophically interesting. We have higher hopes for an account of epistemic emotions.

We sympathize with Morton's goal of delineating a philosophically interesting class of epistemic emotions, but the foregoing considerations lead us to conclude that his proposals fail to achieve it. Yet they also provide some guidance. The deeper problem with Morton's definitions is that they appeal to features extrinsic to the types of states that would fall under the class. How these emotions affect the epistemic activity of the agent or what particular end an emotion is directed at are not features that belong to these emotions as such. They are not intrinsic to them. This is why his accounts yield incorrect results and fail to define a properly unified class. In the next section, we present an account that aims to overcome these problems.



## 2. *The Fitting Evaluation Account*

Rather than appeal to epistemic success, as Morton did, the epistemic notion we will appeal to is that of an *epistemic evaluation*. In general, evaluation involves commending or condemning something in a certain respect to a certain degree.<sup>9</sup> But we can make different kinds of evaluations. For example, we can morally evaluate someone as a good person or an action as wrong, prudentially evaluate a plan as foolish, or aesthetically evaluate a sculpture as beautiful. Paradigm cases of epistemic commendation would be judging or saying that someone's belief is correct, or justified, or constitutes knowledge; others might involve attributions of coherence, rationality, insight, understanding, and so on. Paradigm cases of epistemic condemnation would be judging or saying that someone's belief is incorrect or unjustified; others might involve attributions of incoherence, irrationality, misunderstanding, and so on.

Intuitively, what makes an evaluation epistemic (as opposed to moral or prudential, say), is that it primarily concerns, to put it metaphorically, how one's mind harmonizes or 'meshes' with the world. There are various ways we might attempt to elucidate this idea or delineate more precisely how far epistemic evaluations extend beyond the paradigm cases.<sup>10</sup> We wish to remain neutral here. This will make our account of epistemic emotions somewhat flexible. However, we assume that there's a clear enough intuitive idea here to use in constructing an informative and plausible account of epistemic emotions. Those with more specific commitments concerning what

---

<sup>9</sup> Sometimes "evaluative" is used in a narrower sense, to single out judgements of value ("good", "bad", etc.) from the deontic (judgements with "ought", "is required", etc.) and other normative categories. . We are using it in a broader way here, roughly in line with Heathwood (2015), according to which all normative judgements are evaluative.

<sup>10</sup> For a range of views on what to count as epistemically evaluative, see Alston (2005), Grimm (2009), Engel (2012), Cohen (2016), Kauppinen (2018), Friedman (2020).

counts as epistemically evaluative can fill in the details as they prefer. In the remainder of the section we explain how we incorporate this idea of epistemic evaluation into a definition of the epistemic emotions, taking surprise as our paradigm candidate.

Surprise, as many have recognized, has something to do with a conflict of expectations.<sup>11</sup> But in what way exactly, and how does this make surprise an epistemic emotion? We assume that a theory of epistemic emotions that cannot explain the sense in which surprise is distinctively epistemic is an unsuccessful theory; and if no explanation of the sort could be found we would have good reasons to think there are no such things as epistemic emotions.<sup>12</sup>

Like other emotions, it is part of the nature of surprise that it is fitting in certain circumstances, but not in others.<sup>13</sup> That surprise can be fitting or unfitting is evident from the criticisms we make: The student who did poorly on the exam shouldn't be surprised, we say, since she didn't study and was warned that the exam would be difficult. Her surprise is unfitting. The prisoner who is missed by all 50 sharpshooters of a firing squad should be surprised, unless he had reason to think himself popular with the sharpshooters.<sup>14</sup> His surprise is fitting. Just as one should fear the fearful and only the fearful, one should be surprised at the surprising and only the surprising.

These fittingness conditions for emotions, note, are not merely a matter of what is useful for accomplishing certain ends. Even if an evil demon threatens to kill you unless you are afraid

---

<sup>11</sup> See, e.g. Davidson (1982), Scheffler (1991), Meylan (2014), Baras and Na'aman (forthcoming [online first: 2021]).

<sup>12</sup> We shall take for granted the standard view that surprise is an emotion; indeed, following Ekman (1992), we assume it is a basic emotion, an emotion that distinctively deals with "a fundamental life task" (p.171).

<sup>13</sup> On fittingness see, for instance, Broad (1954: 209) (1954, p. 209), D'Arms and Jacobson (2000), and Howard (2018). For a recent discussion of how different theories of emotions try to explain fittingness conditions, see Ballard (2020).

<sup>14</sup> Leslie (1989: 13).

of a perfectly harmless potato, it is fear of the demon that is fitting, not fear of the potato.<sup>15</sup> Perhaps there's a sense in which you should fear the potato, but there's also a sense in which you shouldn't; and it is this latter sense that fittingness conditions pick out. Similarly, there may be circumstances where surprise would promote one's ends—including one's epistemic ends—without thereby being fitting. Even if a benevolent demon offers you a huge research grant on the condition that you be surprised by some obviously impending event, being surprised may still be unfitting.

Nor should fittingness conditions be conflated with conditions metaphysically necessary or sufficient for possessing the emotion in question. One can feel fear without being in danger (and even, arguably, without a belief that one is in danger) and one can be in danger (and have a belief that one is in danger) without feeling fear. Similarly, one might be surprised independent of a conflict of expectations, and one can be confronted with a fact that conflicts with expectations without feeling surprise. Saying "I expected this would happen, but still feel surprised" is not to speak nonsense, but to admit a kind of unaligned emotional response. Surprise is not impossible without the presence of some surprising fact. It is unfitting.

Finally, there is an ongoing dispute about whether fittingness is basic, or whether it can be grounded in more basic terms such as correctness conditions, value, or reasons.<sup>16</sup> For the purposes of the paper we remain neutral on this question. We take a stand, however, on the question of the *strength* of the evaluation in question. That is, we are taking fittingness conditions not to have the

---

<sup>15</sup> This kind of example, which appears in Crisp (2000), has spawned a large literature on what the difference is between the 'right kinds of reasons' for having some attitude and the 'wrong kind of reasons' originating also with D'Arms and Jacobson (2000). Regardless of whether such cases are problems for fitting-attitude analyses of value, which is the main issue in that literature, they are not problems for the notion of fittingness itself. For discussion of similar cases with respect to belief, see Firth (1978) and Berker (2013).

<sup>16</sup> Defenders of the 'fittingness-first' view include Chappell (2012), McHugh and Way (2016), Cullity (2017), and Howard (2019). For opposition to this view see Rowland (2017), and perhaps Ballard (2020), who attributes a type of fittingness-first view to John McDowell (p.115; 122n7).

force of obligations. Thus, saying that a given danger makes fear fitting doesn't entail that lack of fear in that circumstance is unfitting.<sup>17</sup>

With these considerations in mind, we take the fittingness conditions of surprise to be something like the following:

**Fittingness Conditions for Surprise:** *S*'s surprise that *p* is fitting iff and because *p* conflicts with *S*'s expectations.<sup>18</sup>

We present this only as a preliminary account. If our intent were to defend a particular theory of surprise, it would need further development and defense. For example, one issue about which we are uncertain is the nature of the expectations at issue. The definition above is in terms of the *actual* expectations of the subject. However, there are reasons to instead favour a definition in terms of *rational* expectations. Suppose, for example, that someone irrationally expects that some perennial flowers won't flower next spring, and they are surprised when they come back year after year. It may then seem intuitive to say that they shouldn't be surprised, supporting the rational version of the account over the actuality version. However this issue is resolved, we submit that it should be resolved at the more general level of a theory of emotions, since similar cases bear on the fittingness conditions for emotions like fear, guilt, and anger.<sup>19</sup> For our purposes, what matters is that there is a clear way in which conflicts of expectations figure in surprise's fittingness

---

<sup>17</sup> For recent discussions of this issue, see Berker (2022), Howard (2022), and Fritz (2023).

<sup>18</sup> For simplicity, we render the fittingness-conditions in all-or-nothing terms. However, as Baras and Na'aman (forthcoming [online first: 2021]) argue, it is plausible that these conditions should rather be stated in terms that admit gradability. This could easily be achieved by replacing our 'iff' clause throughout with 'iff *and to such an extent as*'. For other discussions of fittingness and gradability, see also Maguire (2018) and Berker (2022).

<sup>19</sup> Another important question is: What does it take for something to conflict with expectations? Clearly, unless additional clauses are added to the fittingness conditions, one cannot equate it with an event that one takes to be improbable, since one should not be surprised if what one takes to be a fair coin is flipped in the sequence of HHTHTTTH, which only has a 1 in 256 chance of occurring, whereas one should be surprised by HHHHHHHH. But then again, one should not be surprised by 8 heads in a row if it is part of a sequence of 500 flips (but perhaps one *should* be surprised that someone has flipped the coin 500 times!). See Baras and Na'aman (forthcoming [online first: 2021]) for discussion of these kinds of issues.

conditions.<sup>20</sup> These conditions, we think, are where one should turn to understand what makes surprise an epistemic emotion.

So, what is it about the fittingness conditions for surprise that make it an epistemic emotion? A simple proposal worth considering is that epistemic states—expectations—figure in the conditions. The problem is that however one decides which states count as epistemic, this proposal will be too permissive. Suppose there was an emotion that was fitting just in case someone else expects you to do something you should do. (One could imagine beings who have a particular emotional reaction when they bind themselves through a promise). Expectations would make an appearance in the fittingness conditions of this emotion, but it does not thereby seem to be a plausible candidate epistemic emotion. That some reference is made to an epistemic state in the fittingness conditions is too thin a requirement.

What's crucial, rather, is that the fittingness conditions of surprise are epistemically evaluative. Compare with a paradigm moral emotion: guilt. Suppose that guilt about  $\phi$ -ing is fitting iff and because one  $\phi$ 'd and  $\phi$ -ing was wrong.<sup>21</sup> What about these fittingness conditions would make guilt a moral emotion? Not that they involve reference to a morally evaluable event like action. Rather, it's that the conditions themselves involve a moral evaluation: they say one's action was *wrong*. There are a variety of fittingness conditions for guilt and accounts of moral evaluation that one might opt for, but it seems to us that any reasonable combination of such views will result

---

<sup>20</sup> It is worth noting, in particular, that the account we will be offering is compatible with the fittingness conditions for surprise defended by Baras and Na'aman (forthcoming [online first: 2021]), which differ from those given above primarily in including an additional clause requiring that the surprising fact be significant to the agent. We suspect, however, that the role of fittingness in surprise should be explained in a different way. One way would be to say that significance is not definitive of the fittingness conditions of surprise as such, but of emotions generally, since it seems that other emotions like fear and anger are fitting also when what's fearful or angering is significant. Another, compatible way would be to say that significance is not the *source* of surprise's fittingness, but rather something more like a *modifier*, to adapt the terminology from Bader (2016). Since the dispute is not germane to the central point of this paper, however, we will not pursue it further here.

<sup>21</sup> Similar remarks could be made about alternative accounts according to which guilt is a fitting response not to wrongdoing, but to being causally responsible for a bad state of affairs (Zhao 2020).

in fittingness conditions for guilt that involve some moral evaluation, be it of an agent, the action they performed, or the state of affairs that resulted.

Similarly, we take it that however one thinks about surprise and epistemic evaluation, it should result in a view on which the fittingness conditions of surprise make some epistemic evaluation. In particular, it should turn out that taking a new fact to ‘conflict with expectations’ is to make a negative epistemic evaluation of our expectations.<sup>22</sup> The conflict is a manifestation of our mind’s not meshing correctly with the world, and surprise is appropriate in reacting and alerting us of this problem. How exactly one understands the evaluation will partly depend on what one takes expectations to be. On one view, expectations are to be understood as beliefs, and a fact conflicts with an expectation when it shows that belief to be *incorrect*. On another view, expectations are credences, and a fact conflicts with that credence when that credence is sufficiently far from 1, that is, if one’s credences are *far enough away from getting things right*. Either way, fitting surprise involves a negative epistemic evaluation of one’s prior expectations.

Although our account is compatible with a broad range of views about the fittingness conditions of surprise and the nature of epistemic evaluation, there are certain positions it will be incompatible with. We will now briefly raise a couple of reasons why one might be tempted to hold that surprise’s fittingness conditions may not be evaluative at all or at least not epistemically evaluative, and explain why we are not swayed by these reasons.

Presumably facts about expectation conflict supervene on some purely descriptive facts, such as facts about one’s psychology and environment. Couldn’t we then restate surprise’s fittingness conditions in a non-evaluative way, in terms of these descriptive facts? We think not.

---

<sup>22</sup> We take this notion of conflict, like falsehood, to always be a negative epistemic evaluation. In this respect it is like cowardice or sickness, and unlike smallness or bigness. Cowardice and sickness are always negative (as such, since it is always possible to imagine them having positive effects); but being small is good for the size of a tumour, and bad for the size of a sample for scientific study.

Observe that the same kind of supervenience claim holds for guilt; we could restate guilt's fittingness in descriptive terms. But either (as an analytic reductionist might say) attributing such a description is itself a moral evaluation, or else (as others would say) it only makes guilt fitting indirectly, through grounding some moral evaluation. Either way, the fittingness conditions for guilt should come out as morally evaluative. Expunging any kind of moral evaluation from its fittingness conditions, we think, would be to miss something crucial about guilt. Similarly, we think expunging any kind of epistemic evaluation from surprise's fittingness conditions would be to miss something crucial about it, even if one has identified the correct extension of fitting surprise in a purely descriptive way.

One might agree with us in rejecting such purely descriptive recastings of surprise's fittingness conditions, yet still follow Anne Meylan (2014) in doubting that fitting surprise involves a properly *epistemic* evaluation in the way required to be an epistemic emotion. Meylan, like us, is concerned with the question of what would make an emotion supposedly epistemic. She considers as the best candidate a definition according to which an epistemic emotion is one that has an epistemically evaluative property as its formal object (p. 187). But she then argues that none of the standard candidate epistemic emotions, including surprise, meet this requirement. This, Meylan concludes "cast[s] doubt on the very possibility of delineating an *epistemic* kind of emotions" (p. 188).

We agree with Meylan on placing epistemic evaluation at the center of a definition of epistemic emotions. In this way, the account she considers is an important precursor to ours. However, we disagree with Meylan both on what counts as an epistemic evaluation and how it should be incorporated into a definition of epistemic emotions. Airing these disagreements is

useful both to see what distinguishes our proposal from hers and why we are more sanguine about the possibility of defining an interesting category of epistemic emotions.

An emotion's formal object is a property "that must be implicitly ascribed" to whatever is motivating the emotion "if the emotion is to be intelligible" (de Sousa 1990: 122).<sup>23</sup> The formal object of fear is dangerousness, for example, and the formal object of surprise is surprisingness. If we are to categorize surprise but not fear as an epistemic emotion on Meylan's proposal, then, it will have to turn out that surprisingness is an epistemically evaluative property but dangerousness is not. Meylan assumes that truth is the sole final epistemic evaluative property and, further, that if X is the sole final evaluative property in some domain, then all other derivative evaluative properties in that domain must be specifications of X (that is, determinates of the determinable X). This means that an epistemic evaluative property must be a determinate of truth.<sup>24</sup> However, Meylan argues that it is implausible that the usual candidate epistemic emotions like surprise have determinates of truth as their formal objects. For instance, she argues that surprisingness is not a way of being true, since a claim might be surprising without being true. Thus, she claims, surprise must not be an epistemic emotion. Similarly for the other likely candidates.

Formal objects are very closely connected to fittingness conditions; plausibly, an emotion is fitting just in case its particular object instantiates the emotion's formal object. Thus, on a first glance, Meylan's proposal may look equivalent to ours. But it is not. There are two major differences.<sup>25</sup>

---

<sup>23</sup> Kenny (1963, pp. 132ff.) draws this notion from the scholastics (and ultimately from Aristotle). See also Teroni (2007).

<sup>24</sup> This means that Meylan's proposed definition is very similar to the definition used by Candiotta (2020): that epistemic emotions are those emotions with truth as their formal object (p. 565). The concerns we have about Meylan's definition being too restrictive will apply to Candiotta's as well.

<sup>25</sup> We thank an anonymous referee for comments that helped us clarify the differences between our account and Meylan's.



The first difference is that we only require that the fittingness conditions involve making some epistemic evaluation, instead of themselves (or the formal objects they correspond to) being epistemically evaluative properties. This affords our account significant additional flexibility since it broadens the scope both of the potentially relevant evaluations and their targets. The epistemic evaluation need not be of the emotion's particular object itself and the evaluation need not simply consist of an ascription of the emotion's formal object. With surprise, for instance, we can take the relevant epistemic evaluation not to be of the surprising fact or proposition, but rather of the surprised agent, some mental state of theirs, or a relation between mental states and world. And the evaluation can be an attribution of 'had incorrect expectations', for instance, rather than simply an attribution of surprisingness. So our proposal does not require, as Meylan's does, that surprisingness itself is an epistemically evaluative property if surprise is to be an epistemic emotion.

Having incorrect expectations, however, is not a way of being true, so will also not count as an epistemically evaluative property according to Meylan. This brings us to our second disagreement: we think Meylan is being too restrictive about what counts as an evaluative property in some domain, for two reasons. First, as noted, we are open to a pluralism about epistemic values, whereas Meylan assumes monism. Just focusing on the positive, telic properties, we would be open to including knowledge, understanding, and wisdom as epistemically valuable. Second, and more importantly, we think that even if one subscribes to a monistic picture of final epistemic value, one should not assume that all other properties that are epistemically evaluative must be determinants of that finally valuable property. It is helpful once again to compare the moral case. Even if one took Moorean goodness to be the sole final moral evaluative property, this should not mean that moral evaluations must attribute determinants of goodness. One might evaluate an action

as wrong because it was chosen over another action that could have done more good; one might evaluate an agent as virtuous because they are disposed to produce good outcomes; and so on. Wrongness and virtuousness may not be final moral evaluative properties on a Moorean theory, but are moral evaluative properties nonetheless. And even if ultimately one must cash them out in terms of their relation to the sole finally evaluative property of goodness, the relation need not be one of specification. Promotion and hindrance, respect and disrespect seem to be good alternative candidates, as well as dispositions to promote, hinder, respect, or disrespect the relevant value.

Thus, even if truth were the sole final epistemically evaluative property, this wouldn't mean that all epistemic evaluations must be ascriptions of various kinds of truth. Being epistemically justified isn't a way of being true, but it is an epistemically evaluative property. And even those who take truth to be the sole final epistemic value can acknowledge this, by taking justification to be a matter of truth promotion, a matter of respect for truth, or some such.<sup>26</sup> Indeed we think they must acknowledge this, for without doing so they cannot recognize most paradigm epistemic evaluations—of a belief's being incorrect, coherent, incoherent, justified, unjustified, rational, irrational, warranted, unwarranted—as epistemic evaluations.

The upshot is that Meylan's alternative proposed definition of epistemic emotions imposes overly strong restrictions and that her argument for doubting the possibility of delineating a category of epistemic emotions is unsound. Our account takes a more liberal view from the start, allowing epistemic emotions to be ones that have a specific relation to epistemically evaluative conditions generally, rather than just having specifications of truth as formal objects that must be ascribed to their target. As we shall see, this approach yields a plausible extension for 'epistemic

---

<sup>26</sup> Perhaps truth could then function as the center of a pros hen ('focal meaning') relation, in Aristotle's sense. On extending the notions of respect and disrespect to epistemology, as well as a more general discussion of the connection between final epistemic value and epistemic justification, see Sylvan (2018, 2020).

emotion', neither trivially inclusive nor exclusive, and makes clear the sense in which epistemic emotions are epistemic.

We are now in a position to properly state our positive proposal. What makes an emotion epistemic is that it has a certain kind of fittingness condition. More precisely:

**Fittingness Account of Epistemic Emotions (FAEE):** *e* is an epistemic emotion iff (i) *e* is an emotion, and (ii) *e* is fitting just in case and because some epistemically evaluative condition obtains, and (iii) this fittingness condition holds of *e* specifically as such and at the most basic level.

As stated, we are working on the basis of an intuitive understanding of what emotions are, so we will not discuss condition (i). However, remarks are in order about the different components in (ii) and (iii). By clarifying the nature of each of these components, we hope in turn to highlight the advantages of our account.

*...is fitting...:* We have introduced fittingness conditions already, and will not discuss them further here, except to emphasize that an emotion type's fittingness conditions are essential to that emotion type. A state could not be fear without its being fitting only in response to danger. By basing our account of epistemic emotions on fittingness conditions, we thus avoid the problems of having a connection to the epistemic that is too contingent or external to the emotion in question.

*... and because...:* A simple biconditional is clearly insufficient to characterize the way fittingness conditions relate to their corresponding emotions. Suppose someone feels scared about going on a train, which they believe to be dangerous and fearsome. However, their fear is not a response to this danger, but rather to an ingrained fear of green hats, which passengers must wear while on the train. Then the fear would be unfitting, though it would be directed at an object about which they could be fittingly afraid.

*...epistemically evaluative condition:* This is just a condition which involves some epistemic evaluation. The fittingness conditions for surprise, we've argued above, will meet this condition for being an epistemic emotion. By contrast, the correctness conditions for guilt, fear, sadness, and so on don't involve any epistemic evaluations, at least not in the same way. Some of the sense of "same way" is specified in the other components of (ii) discussed below.

*...specifically as such...:* That is, insofar as *s* is the specific type of emotional state that it is (e.g. a state of surprise, or guilt, or fear). Certain fittingness conditions may apply to the state not qua being that specific type of emotion, but rather qua being an instance of an emotion. There may be certain aspects of fittingness conditions that apply to fear, guilt, surprise, and any other emotion just as emotions. For example, certain cognitivists may hold that emotions are beliefs, which would mean that all emotions would be fitting only if they are true, or knowledge, or some such.<sup>27</sup> Without the qualification, therefore, this would risk the unwelcomed result that fear and guilt (indeed, all emotions) are epistemic emotions, since they would have fittingness conditions that involve an epistemic evaluation.

*...at the most basic level...:* Instances of emotions have specific objects. And the specific nature of the norm that applies to them depends on the specific nature of its object. However, we should ignore those specific objects when drawing categorical lines. To see why, take the case of being surprised at the fact that one of your friends wronged another. If the preliminary account above is correct, then surprise is fitting here just in case you didn't expect that your friend would wrong the other. As it happens, this specific condition involves a moral evaluation of your friend's action. However, we would not want to conclude on that account that surprise is a moral emotion. What we should consider is the specific emotion abstracted from its specific objects. That is, we

---

<sup>27</sup> See e.g. (Shah 2003; Shah and Velleman 2005; Williamson 2000; Singh 2021). Following Singh (2021) we take it that there is a seamless transition between the idiolect of 'belief norms' and that of fittingness conditions for belief.

want to evaluate it just *qua* state of surprise. So abstracted, we can identify the norm that attaches to its specific emotion type; and it is this norm that determines the fittingness conditions relevant to assessing whether it is epistemic, by the lights of FAEE. One can feel guilty about epistemically evaluative matters (e.g. not knowing a fact), and one can worry about epistemically evaluative matters. These specific emotions' fittingness conditions will involve epistemic evaluations. However, the evaluations stem just from the particular objects. The present condition essentially states that we should ignore those specific objects when we evaluate whether an emotion is epistemic.

### *3. Beyond Surprise: Further Candidate Epistemic Emotions*

As the foregoing discussion suggests, our definition of epistemic emotions identifies a category of philosophical interest—as much interest, we suspect, as the category of moral emotions. It also predicts that emotions like anger, fear, worry, and hope are not epistemic emotions, since none of them have fittingness conditions of the right sort (as defined by FAEE). For example, we take it that anger, fear, and worry would have fittingness conditions roughly along the following lines:

**Fittingness Conditions for Anger:** Anger towards *A* is fitting iff and because *A* has wronged someone.

**Fittingness Conditions for Fear:** Fear of *A* is fitting iff and because *A* is dangerous.

**Fittingness Conditions for Worry:** Worry that *p* is fitting iff and because *p* would be bad and it is not settled that  $\neg p$ .

**Fittingness Conditions for Hope:** Hope that *p* is fitting iff and because *p* is a good possible outcome.

Since the fittingness conditions for anger and fear clearly do not include any epistemic evaluations, they are easily ruled out by (ii) in FAEE.

One might object, however, that by our definition worry is an epistemic emotion, since the notion of being ‘not settled’ is an epistemic evaluation. To respond to this problem, we should distinguish between two interpretations of “not settled that  $\neg p$ ”. On one interpretation, the settledness at issue is an objective, metaphysical kind of settledness. On some views, some future contingent statements are neither determinately true nor determinately false, but are unsettled until some future time, whereas similar contingent statements about the present and past are settled, either determinately true or determinately false. If this is how we are interpreting the unsettledness relevant to fitting worry, then there is clearly no epistemic evaluation involved, and so FAEE implies that worry is not an epistemic emotion. But we think some will prefer to take the relevant kind of unsettledness to be a kind of subjective unsettledness: the relevant agent’s doxastic state does not rule out  $\neg p$ . Would this make worry an epistemic emotion according to FAEE? No. On the intended reading, saying that someone’s doxastic state does not rule out  $\neg p$  is to describe their epistemic state, not to evaluate it.<sup>28</sup> They may be correct, epistemically rational, or intellectually virtuous in not ruling it out, or they may be incorrect, irrational, or vicious. Hence, clause (ii) of FAEE prevents worry from counting as an epistemic emotion even if an epistemic sense of unsettledness appears in its fittingness conditions. An analogous point applies to hope. Even if the notion of possibility at play in its fittingness conditions is epistemic (as we suspect), it is not an

---

<sup>28</sup> Perhaps there is also an evaluative reading of ‘not settled’, but our contention is that this reading is not relevant to the fittingness conditions of worry. Intuitively, this is because worrying about  $p$  does not involve making an evaluation that its being unsettled is bad (or good), but simply taking it that it is (in one of the descriptive ways described above).

epistemic evaluation.<sup>29</sup> Lacking an epistemically evaluative element, therefore, hope is also ruled out from the category of epistemic emotions.

Our account also rules out other suspicious cases that have been taken as epistemic emotions in the literature. First, we agree with de Sousa (2009, pp.140-41) and Meylan (2014, pp. 179-180) that we should distinguish feelings from emotions. Therefore, states like *the feeling of knowing*, or the *feeling of believing* do not count as epistemic emotions on our account, given condition (i) in FAEE. Second, Morton's *epistemic worry* is ruled out by condition (iii), since the emotion as such—worry—has been shown to not be an epistemic emotion. Obviously, one can worry about bad epistemic consequences ('If I don't read this article carefully, I may miss something important!'), but that is accidental to the emotion as such at the most basic level. The same would be true if someone wanted to define something like epistemic anger or sadness, understood as being angry or sad at something that has gone epistemically awry ('Someone fooled me into believing a falsehood!').

At the same time, our account achieves the goal we set out for: it identifies a sense in which surprise is distinctively epistemic, in a way that these other emotional states are not. And we believe that our account also gets the right results with regards to other emotions we are inclined to count as epistemic, such as puzzlement and curiosity.<sup>30</sup> To see why, here is a first-pass at what their fittingness conditions might look like:

---

<sup>29</sup> Part of the attraction of the (widely rejected) analysis of hope as desire *plus* belief that the desired thing is possible may stem from the fact that possibility partly defines the fittingness conditions for this emotion. However, if we need to invoke such a belief here, we should also invoke a belief that a slight took place as part of the definition of anger (since one should presumably not be angry about a slight that didn't take place). If this is right, condition (iii) may suffice to rule out hope from being an epistemic emotion, since the epistemic component shows up insofar as it is an emotion as such. For an excellent recent survey of the literature on hope, see Rioux (2021).

<sup>30</sup> We follow Morton in assuming that there is a sense of 'curiosity' that picks out an emotion. It is also often taken to be a desire, and sometimes as a character trait. If it is a desire it may still be an emotion (Scarantino, 2014). However, on the supposition that it is a mere desire or a character trait, then no theory should count curiosity as an epistemic emotion. For an excellent survey of the recent literature on curiosity and defense of a desire-for-knowledge account see Whitcomb (2010).

**Fittingness Conditions for Puzzlement:** *S*'s puzzlement about why *p* is fitting iff and because *p* has an explanation but is inexplicable given *S*'s epistemic possibilities.

**Fittingness Conditions for Curiosity:** *S*'s curiosity about *q* is fitting iff and because *q* has an answer but *S* is ignorant about the answer to *q*.

To be clear, we are not endorsing these fittingness conditions, which are clearly in need of refinement (just as the conditions for surprise above). Rather, we want to suggest that fittingness conditions *along these lines* seem to be correct, and that this supports FAEE, since it explains why we are inclined to count these as epistemic emotions. This is because both involve evaluations of oneself as failing by the light of evaluative epistemic standards, insofar as one lacks a certain epistemic good: knowledge in the case of curiosity, understanding in the case of puzzlement. Curiosity and puzzlement are fitting insofar as they register such shortcomings, as such, when they arise. And as with the fittingness conditions of surprise (or guilt), we think attempts to construe these conditions non-evaluatively would be to miss one of their central features.

#### *4. Conclusion*

The longstanding view that emotions are opposed to reason is now moribund. Much recent work in both philosophy and empirical disciplines highlights how crucial emotions are to our intellectual lives. To give a few examples: it has been argued that emotions are ways of recognizing value, either as full-fledged judgments (Solomon 1988; Neu 2000; Nussbaum 2001), experiences (Prinz 2004; Döring 2007; Tappolet 2016; Milona 2016), or acquaintance (Roberts and Wood 2013; Ballard 2020); that they are the basis for epistemic virtue (Zagzebski 1996; Goldie 2004; Brady 2018); that they sift information for relevance (de Sousa 1990; Ben-Ze'ev 2000; Deonna and Teroni 2012; Brady 2013); that they provide risk signals without which we act irrationally



(Damasio 1994, 2003); and that emotions undergird epistemic ascriptions in a way that may explain their sensitivity to pragmatic factors (Nagel 2010; Newton 2022).

Beyond the epistemic relevance of emotions in general, there seems to be a class of emotions that are in some sense specifically epistemic. Yet, we have seen that there are significant conceptual difficulties in recognizing such a class, and that Morton's foundational work fails to clear them. Drawing from the venerable tradition of individuating mental states in terms of their fittingness conditions, we have offered an account that we've argued provides a sound basis for the classification.

At this point it is natural to wonder: Why does such a classification matter? Why care whether there is a class of epistemic emotions to which states like surprise, puzzlement, and curiosity belong, but to which fear, worry, and pride do not?

There is an interesting general question here about how improvements to classification schemes can constitute genuine theoretical progress (Franklin-Hall 2015). But it is clear that they can. Extending the category numbers to include 0 was an important development in mathematics; arranging the chemical elements in a periodic table an important development in chemistry; and classifying whales as mammals rather than fish an important advance in biology. We don't expect anything as dramatic from the classificatory proposal we have made. But we do think that it is an advance, and that it may be useful to epistemologists and cognitive scientists for generating insights and guiding worthwhile avenues of inquiry.

To focus on a particular example on the empirical side, a recent body of research has shown the important role played by epistemic emotions like surprise and curiosity in knowledge acquisition (Muis et al. 2015a; Muis et al. 2015b; Chevrier et al. 2019; Vogel et al. 2019, 2020; Slinger 2021; Vilhunen et al. 2022; Vilhunen et al. 2023). An interesting set of recent studies

revealed that such emotions were stronger predictors of inquisitive behaviour than so-called ‘achievement emotions’ like pride and shame (Vogl et al. 2020).<sup>31</sup> In one of these studies, participants were given a series of trivia questions, and were asked to rate the strength of these various feelings. After telling them which answers they got right and wrong, participants were given the opportunity to click to see the right answers. While surprise and curiosity were shown to be highly predictive of knowledge-seeking behaviour ( $p < .001$ ), pride and shame were either barely significant ( $p < .05$ ) or insignificant. One reason this finding is remarkable is that research has shown links between ‘achievement emotions’ and academic success (e.g. Camacho-Morles et al. 2021). Thus, as Vogl and colleagues suggest, the finding may have important pedagogical implications, suggesting teachers should seek to provide surprise- and curiosity-inducing situations to improve students’ learning.

These studies obviously presuppose the cogency of a distinction between epistemic and other emotions, such as ‘achievement emotions’. However, Vogl and colleagues lack the classification scheme to properly make it. They cite Morton’s definition apparently with approval: “[Epistemic] emotions relate to the knowledge-generating qualities of cognitive tasks and activities (Morton, 2010)” (p.625)”. However, as we have shown, this definition will not serve their purposes, since it would count pride and shame about epistemic matters as epistemic emotions, rather than as achievement emotions.<sup>32</sup>

This is therefore a case where good research has been conducted in spite of a bad conceptual framework, precisely because the flawed framework has been ignored. By contrast,

---

<sup>31</sup> The studies did not find a robust connection for a third epistemic emotion, confusion, though some effect was found in one of the studies. The investigators plausibly suggest that this may be due to idiosyncrasies of the study, such as floor effects (637-8). That said, the observed effects of confusion were stronger than for both achievement emotions tested.

<sup>32</sup> Morton is cited again on p.626 as holding that epistemic emotions are “affective states that can motivate critical reflection and inquiry”. The definition by one of the author’s study summarized in the same page is much the same: “emotions that relate to knowledge and the generation of knowledge”.

other recent studies have not been so discriminating. Though purportedly focused on the role of epistemic emotions in particular, a recent study amalgamates under the category emotions like “disappointment, frustration, and elation” (p.216), excitement (characterized as a “stronger version of curiosity”) (ib.), joy (p.219), and pride (p.224) (Törnqvist and Wettergren 2023). Of course, disappointment, joy, and pride can, like any emotions, influence epistemic processes in interesting ways; but the conceptual amalgamation of them in a category containing the properly epistemic emotions risks obscuring differences of precisely the sort Vogl and colleagues’s studies found.<sup>33</sup> We thus hope that an improved conceptual framework about epistemic emotions may better guide future psychological research. Of course, like any proposal in this area, it is to be judged mainly by its fruits.

Beyond these empirical applications, we believe that a promising research agenda in epistemology opens up, exploring whether epistemic emotions can play a similar role as moral emotions play in contemporary ethical theory. For example, can one defend epistemic dilemmas by appeal to epistemic emotional residue, as moral dilemmists have appealed to moral emotional residue?<sup>34</sup> Can one develop sentimentalist metaepistemologies that parallel the various moral sentimentalisms, making epistemic emotions either constitutive of epistemic normativity or else central to our way of knowing about it? Might epistemic emotions play central roles in theories of epistemic virtue and motivation, as moral emotions have in theories of moral virtue and motivation? At this point we must leave these and other such questions for further research, but we take it that they will be pursued more effectively when guided by a classification of epistemic

---

<sup>33</sup> The dangers are particularly acute for qualitative, narrative-based studies like Törnqvist and Wettergren’s, where the conceptual tools play a stronger role in interpretation, and quantitative data is lacking that might help disentangle different forms and degrees of influence from different types of emotions.

<sup>34</sup> Greco (forthcoming) raises this question and suggests a negative answer. In (Deigan 2023), one of us argues that the case for dilemmas based on the claim that puzzlement is epistemic residue is about as strong as that for moral dilemmas based on the claim that guilt is moral residue.

emotions that is appropriately narrow and which highlights the intrinsic connection between the epistemic emotions and the epistemically evaluative.<sup>35</sup>

## References

- Alston, William P. 2005. *Beyond "Justification": Dimensions of Epistemic Evaluation* (Cornell University Press).
- Arango-Muñoz, Santiago, and Kourken Michaelian. 2014. *Epistemic Feelings and Epistemic Emotions (Focus Section)* (Philosophical Inquiries).
- Ballard, Brian Scott. 2020. 'The Epistemic Significance of Emotional Experience', *Emotion Review*, 13: 113-24.
- Baras, Dan, and Oded Na'aman. forthcoming [online first: 2021]. 'What Makes Something Surprising?', *Philosophy and Phenomenological Research*.
- Ben-Ze'ev, Aaron, 2000, *The Subtlety of Emotions*, Cambridge, MA: MIT Press.
- . 2002. Are envy, anger, and resentment moral emotions?. *Philosophical Explorations*, 5(2), 148-154.
- Berker, Selim. 2013. 'The Rejection of Epistemic Consequentialism', *Philosophical Issues*, 23: 363-87.

---

<sup>35</sup> This paper was presented at the online Surprise Workshop hosted by the Hebrew University in Jerusalem in 2020. We thank the participants, especially Dan Baras, Oded Na'aman, and David Enoch for their feedback. For discussion, thanks to Samuel Boardman, Dan Ferguson, Dan Greco, Allison Piñeros Glasscock, and especially Zoltán Gendler Szabó, who provided detailed comments. We are also thankful for the feedback from anonymous referees, which significantly improved the paper. Finally, we gratefully acknowledge funding from the University of Toronto-Mississauga Postdoctoral Fellowship Award Program, the Alexander von Humboldt Foundation, and from the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) within the Centre for Advanced Studies in the Humanities "Human Abilities", grant number 409272951.

- Brady, Michael S. 2013. *Emotional insight: The epistemic role of emotional experience* (OUP Oxford).
- . 2018. 'The role of emotion in intellectual virtue.' in Heather Battaly (ed.), *The Routledge Handbook of Virtue Epistemology*.
- Broad, C. D. 1946. 'Some of the Main Problems of Ethics'. *Philosophy*, 21(79), 99-117.
- . 1954. 'Emotion and sentiment', *Journal of Aesthetics and Art Criticism*, 13: 203-14.
- Brun, Georg, and Dominique Kuenzle. 2008. 'A new role for emotions in epistemology?' in Georg Brun, Ulvi Dogluoglu and Dominique Kuenzle (eds.), *Epistemology and Emotions* (Ashgate Publishing Company).
- Camacho-Morles, J., Slemp, G.R., Pekrun, R., Loderer, K., Hou, H. and Oades, L.G., 2021. 'Activity achievement emotions and academic performance: A meta-analysis.' *Educational Psychology Review*, 33(3), pp.1051-1095.
- Candiotto, Laura. 2020. 'Epistemic Emotions and the Value of Truth', *Acta Analytica*, 35: 563-77.
- Carruthers, Peter. 2017. 'Are epistemic emotions metacognitive?', *Philosophical Psychology*, 30: 58-78.
- Chappell, Richard Yetter. 2012. 'Fittingness: The sole normative primitive', *Philosophical Quarterly*, 62: 684 - 704.
- Chevrier, M., Muis, K.R., Trevors, G.J., Pekrun, R. and Sinatra, G.M., 2019. 'Exploring the antecedents and consequences of epistemic emotions'. *Learning and instruction*, 63, p.101209.
- Cohen, Stewart. 2016. 'Theorizing about the epistemic', *Inquiry: An Interdisciplinary Journal of Philosophy*, 59: 839-57.

- Crisp, Roger. 2000. 'Review of *Value ... And what follows* by Joel Kupperman', *Philosophy*, 75: 452-62.
- Cullity, Garrett. 2017. 'Moral Virtues and Responsiveness for Reasons.' in Stewart Braun and Noell Birondo (eds.), *Virtue's Reasons: New Essays on Virtue, Character, and Reasons* (Routledge).
- Damasio, Antonio R., 1994, *Descartes' Error: Emotion, Reason, and the Human Brain*, New York: G.P. Putnam's Sons.
- , 2003, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*, Orlando, FL: Harcourt.
- D'Arms, Justin, and Daniel Jacobson. 2000. 'Sentiment and value', *Ethics*, 110: 722-48.
- Davidson, Donald. 1982. 'Rational animals', *Dialectica*, 36: 317-28.
- Deigan, Michael. 2023. 'Conceptual limitations, puzzlement, and epistemic dilemmas', *Philosophical Studies*: 1-26.
- Deonna, J. and Teroni, F., 2012. *The emotions: A philosophical introduction*. Routledge.
- De Sousa, Ronald. 1990. *The rationality of emotion* (Mit Press).
- . 2009. 'Epistemic Feelings', *Mind and Matter*, 7: 139-61.
- Dokic, Jerome. 2012. 'Seeds of self-knowledge: noetic feelings and metacognition.' in Michael Beran, Johannes Brandl, Josef Perner and Joëlle Proust (eds.), *The Foundations of Metacognition* (Oxford University Press).
- Döring, Sabine A., 2007, "Seeing What to Do: Affective Perception and Rational Motivation", *Dialectica*, 61(3): 363–394. doi:10.1111/j.1746-8361.2007.01105.
- Ekman, Paul. 1992. 'An argument for basic emotions', *Cognition & emotion*, 6: 169-200.
- Engel, Pascal. 2012. 'Trust and the doxastic family', *Philosophical Studies*, 161: 17-26.

- Firth, Roderick. 1978. "Are Epistemic Concepts Reducible to Ethical Concepts?' in Alvin Goldman and Jaegwon Kim (eds.), *Values and Morals: Essays in Honor of William Frankena, Charles Stevenson, and Richard Brandt* (Kluwer Academic Publishers).
- Franklin-Hall, Laura. 2015. 'Natural kinds as categorical bottlenecks', *Philosophical Studies*, 172: 925-48.
- Friedman, Jane. 2020. 'The Epistemic and the Zetetic', *Philosophical Review*, 129: 501-36.
- Goldie, Peter 2004. 'Emotion, reason and virtue.' In Dylan Evans & Pierre Cruse (eds.), *Emotion, Evolution and Rationality*. Oxford University Press.
- . 2012. 'Loss of Affect in Intellectual Activity', *Emotion Review*, 4: 122-26.
- Greco, D. (forthcoming). On the Very Idea of an Epistemic Dilemma. In N. Hughes (Ed.), *Essays on Epistemic Dilemmas*: Oxford University Press.
- Grimm, Stephen R. 2009. 'Epistemic Normativity.' in Adrian Haddock, Alan Millar and Duncan Pritchard (eds.), *Epistemic Value* (Oxford: Oxford University Press).
- Howard, Christopher. 2018. 'Fittingness', *Philosophy Compass*, 13: e12542.
- . 2019. 'The Fundamentality of Fit.' in Russ Shafer-Landau (ed.), *Oxford Studies in Metaethics, vol. 14*.
- Kauppinen, Antti. 2018. 'Epistemic Norms and Epistemic Accountability', *Philosophers' Imprint*, 18.
- Leslie, John. 1989. *Universes* (Routledge).
- McHugh, Conor, and Jonathan Way. 2016. 'Fittingness First', *Ethics*, 126: 575-606.
- Meylan, Anne. 2014. 'Epistemic Emotions: a Natural Kind?', *Philosophical Inquiries*, 2: 173-90.
- Milona, Michael (2016), "Taking the perceptual analogy seriously. *Ethical Theory and Moral Practice*, 19(4), 897-915.

- Morton, Adam. 2010. 'Epistemic Emotions.' in Peter Goldie (ed.), *The Oxford Handbook of Philosophy of Emotion* (Oxford University Press: Oxford).
- Muis, K. R., Pekrun, R., Sinatra, G. M., Azevedo, R., Trevors, G., Meier, E., & Heddy, B. C. (2015a). The curious case of climate change: Testing a theoretical model of epistemic beliefs, epistemic emotions, and complex learning. *Learning and Instruction*, 39, 168–183
- Muis, K. R., Psaradellis, C., Lajoie, S. P., Di Leo, I., & Chevrier, M. (2015b). The role of epistemic emotions in mathematics problem solving. *Contemporary Educational Psychology*, 42, 172–185
- Nagel, Jennifer. 2010. 'Epistemic anxiety and adaptive invariantism.' *Philosophical Perspectives*, 24, pp.407-435.
- . 'Natural Curiosity.' in Arthurs Logins and Jacques-Henri Vollet (eds.), *Putting Knowledge to Work: New Directions for Knowledge-First Epistemology* (Oxford University Press: Oxford ).
- Neu, Jerome, 2000, *A Tear is an Intellectual Thing: The Meanings of Emotion*, Oxford, New York: Oxford University Press.
- Newton, L., 2022. 'Epistemic anxiety and epistemic risk.' *Synthese*, 200(4), p.324.
- Nussbaum, Martha C., 2001, *Upheavals of Thought: The Intelligence of Emotions*, Cambridge: Cambridge University Press. doi:10.1017/CBO9780511840715
- Prinz, Jesse, 2004, *Gut Reactions: a Perceptual Theory of Emotion*, Oxford: Oxford University Press.
- Rawls, John, 1999. *A Theory of Justice: Revised Edition*. The Belknap Press of Harvard University Press.
- Rioux, C. 2021. 'Hope: Conceptual and normative issues', *Philosophy Compass*, 16(3), e12724.



- Roberts, R.C. and Wood, W.J., 2007. *Intellectual virtues: An essay in regulative epistemology*.  
Oxford University Press.
- Roeser, S., 2010. *Moral emotions and intuitions*. Springer.
- Rowland, Richard. 2017. 'Reasons or Fittingness First?', *Ethics*, 128: 212-29.
- Scarantino, Andrea (2014). 'The motivational theory of emotions'. In Justin D'Arms & Daniel Jacobson (eds.), *Moral Psychology and Human Agency: Philosophical Essays on the Science of Ethics*. Oxford University Press.
- Scheffler, Israel. 1991. *In Praise of the Cognitive Emotions: And Other Essays in the Philosophy of Education* (Routledge).
- Shah, Nishi. 2003. 'How truth governs belief', *Philosophical Review*, 112: 447-82.
- Shah, Nishi, and David J. Velleman. 2005. 'Doxastic deliberation', *Philosophical Review*, 114: 497-534.
- Singh, Keshav. 2021. 'Evidentialism doesn't make an exception for belief', *Synthese*, 198: 5477-94.
- Slinger, M.W., 2021. *Epistemic Emotions and the Number of Sources Explored* (Doctoral dissertation, Queen's University (Canada)).
- Solomon, Robert C., 1976, *The Passions*, Garden City, New York: Doubleday Anchor.
- ., 1988, "On Emotions as Judgments", *American Philosophical Quarterly*, Vol.25. No.2: 183-191.
- Stocker, Michael. 2004. 'Some considerations about intellectual desire and emotions.' in Robert C. Solomon (ed.), *Thinking about Feeling: Contemporary Philosophers on Emotions* (Oxford University Press: Oxford ).
- Sylvan, Kurt L. 2018. 'Veritism Unswamped', *Mind*, 127(506): 381-435.
- . 2020. 'An Epistemic Non-Consequentialism', *The Philosophical Review*, 129: 1-51.

- Tappolet, Christine 2016, *Emotions, Values, and Agency*, Oxford: Oxford University Press.  
doi:10.1093/acprof:oso/9780199696512.001.0001
- Tollefsen, Deborah Perron. 2017. 'Epistemic Reactive Attitudes', *American Philosophical Quarterly*, 54: 353-66.
- Törnqvist, Nina. and Wettergren, Åsa., 2023. Epistemic emotions in prosecutorial decision making. *Journal of Law and Society*. 50(2): 208-30.
- Vilhunen, E., Chiu, M.H., Salmela-Aro, K., Lavonen, J. and Juuti, K., 2023. 'Epistemic Emotions and Observations Are Intertwined in Scientific Sensemaking: A Study among Upper Secondary Physics Students.' *International Journal of Science and Mathematics Education*, 21(5), pp.1545-1566.
- Vilhunen, E., Turkkila, M., Lavonen, J., Salmela-Aro, K. and Juuti, K., 2022. 'Clarifying the relation between epistemic emotions and learning by using experience sampling method and pre-posttest design'. *Front. Educ.: Educ. Psychol.*: 1-7.
- Vogl, E., Pekrun, R., Murayama, K. and Loderer, K., 2020. 'Surprised–curious–confused: Epistemic emotions and knowledge exploration.' *Emotion*, 20(4), p.625.
- Vogl, Elisabeth, Reinhard Pekrun, Kou Murayama, Kristina Loderer, and Sandra Schubert. "Surprise, curiosity, and confusion promote knowledge exploration: Evidence for robust effects of epistemic emotions." *Frontiers in psychology* 10 (2019): 2474.
- Williamson, Timothy. 2000. *Knowledge and its Limits* (Oxford University Press).
- Zagzebski, Linda Trinkaus. 1996. *Virtues of the Mind: An Inquiry Into the Nature of Virtue and the Ethical Foundations of Knowledge* (Cambridge University Press).
- Zhao, Michael. 2020. 'Guilt Without Perceived Wrongdoing', *Philosophy and Public Affairs*, 48: 285-314.

