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Grounding evaluative concepts

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Evaluative concepts qualify as abstract because they seem to go beyond what is given in experience. This is especially clear in the case of moral concepts. Justice, for example, has no fixed appearance. Less obviously, aesthetic concepts may also qualify as abstract. The very same sensory input can be regarded as beautiful by one person and ugly by another. Artistic success can also transcend sensory accessible features. Here, we focus on moral badness and aesthetic goodness and argue that both can be grounded in emotional responses. Emotions, in turn, are grounded in bodily perceptions, which correspond to action tendencies. When we conceptualize something as good or bad (whether in the moral or aesthetic domain), we experience our bodily responses to that thing. The moral and aesthetic domains are distinguished by the emotions that they involve.

This article is part of the theme issue 'Varieties of abstract concepts: development, use and representation in the brain'.

1. Introduction: value as abstract

Grounded cognition [1–3] is a recent revival of the classical empiricist dictum that all concepts originate in the senses [4]. More accurately, defenders of grounded cognition aim to show that the resources used in higher cognition are derived from sensory representations, motor responses and emotions (which may, as we will see, be sensorimotor states). At its limit, grounded cognition entirely eschews 'amodal' representations, and, at most, allows polymodal 'convergence zones' that coordinate modality-specific representations [5]. Critics of the approach insist that amodal representations are required for cognition. More specifically, amodal representations are often presumed to be necessary in order to explain our capacity to grasp abstract concepts. Abstract concepts are generally presumed to include moral concepts. For example, in a representative study, Paivio & Csapo [6] studied abstract concepts using these nine examples: *justice*, *morality*, *bravery*, *freedom*, *ability*, *ego*, *amount*, *theory* and *grief*. The first four have an ethical dimension. Moral concepts can therefore be regarded as paradigm cases of abstract concepts and, as such, they might be said to pose a problem for grounded cognition. Here, we will suggest that this is not the case. We will recommend a general approach to evaluative concepts including both moral and aesthetic concepts, which, though neglected in this literature, are arguable also abstract. Our approach emphasizes emotion and embodiment.

First, a little more background is necessary to see why evaluative concepts are abstract and seem to resist grounding. Abstractness is defined as the opposite of concreteness. Concreteness, in turn, is characterized in a variety of ways: in terms of being touchable and manipulable [7], as easily arousing mental imagery [8] and as referring to objects, materials or persons [9]. Concepts, such as *justice*, can be regarded as relatively abstract by all these measures. The reason for that stems from what can be called variable instantiation. There are many different ways to be just: distributing goods equitably, following procedures of due process and rectifying discrimination. These are not discrete, touchable entities, and they do not look alike; likewise for the other moral concepts just mentioned and for negative counterparts such us unjust and immoral.

The point also extends to evaluative concepts in other domains. Consider aesthetics. As with morals, aesthetics is a domain where we evaluate things as good or bad. One might think that aesthetics is easier to ground in the senses, because aesthetic evaluation is often based on sensory features, as when we assess something as beautiful. In fact, the word aesthetics was reintroduced in the eighteenth century to refer to the science of the senses [10]. But things are not so simple. Sibley [11] argues that no set of non-aesthetic concepts, including concepts of shapes or colours, is ever sufficient for the application of aesthetic concepts. Although aesthetic terms such as 'unified, balanced, integrated' depend on the presence of specific perceptual features, they additionally require the application of taste. The pleasure we take in aesthetic qualities therefore differ from those in non-aesthetic ones. The conditions under which those pleasures are elicited include, for example, sensitivity to the specific context of a work of art, and therefore require more than just perceptual capacities on the perceiver's side [12,13].

What holds for these aesthetic qualities can also be said of *beauty*. Beauty is often attributed to how things appear, but many philosophers deny that beauty can be reduced to perceptual features. For example, Plato believes that beauty applies to the souls as well as bodies, and in both cases, he emphasizes the idea of harmony, which is not defined in terms of sensory arrangements, but rather in terms of parts serving the role for which they are suited [14]; for Medieval philosophers, beauty is sometimes equated with perfection and therefore requires knowledge of each category's ideal [15]; in the eighteenth century, beauty was widely associated with utility and thus requires knowledge of function [16]. These theories tended to be objectivist, allowing that beauty has mind-independent essence, which might not be easy to discern by the senses. In more recent times, beauty has more frequently been regarded as sensuous and subjective, but, even now, many deny that beauty is simply a perceivable feature of the world. The idea here is that aesthetic concepts do not just pick out what is out there, but impose something of the viewer. Thus, even those who link beauty to perception propose that it depends on reactions in normal perceivers [17] or is tinged with feeling [18]. Thus, while maybe not being *entirely* abstract, beauty goes beyond mere perception. This seems to be a consensus on beauty.

If one surveys work on beauty, one can extrapolate at least three reasons to say that aesthetic evaluation relies on something abstract or non-sensory. First, beauty takes many forms: elegance, balance, graphic impact, delicate contours, striking (or subtle) colour combinations and ideals of perfection within a category. Likewise, different objects have their own standards of beauty. Beauty-making features in one kind of object might not extend to others. (A beautiful desert has different features to a beautiful mountain, or a beautiful face.) Thus, there is not a single look of beauty, but rather many. There are also beautiful sounds, and these too are highly varied. One might address this by proposing that there are many kinds of beauty, each of which is sensory. That would render the term 'beauty' radically ambiguous. It is more plausible, we think, that the category gains coherence from some common denominator that goes beyond external appearances. Second, individuals have different standards of beauty, so beauty cannot be simply read off sensory features. In a striking demonstration of this, Thorndike [19] found that there is virtually no tendency towards interpersonal convergence in aesthetic judgements about simple geometrical forms. Third, the term 'beauty' is used somewhat ambiguously [20]. It extends to uses that are synonymous to 'aesthetic value' or 'artistic success' in a broader sense. So even if one concedes that 'beauty' in a narrower sense has a sensory dimension, there is the broader category of 'aesthetic goodness' that extends beyond sensory qualities.

This becomes even more obvious with respect to evaluations in the domain of art. The assessment of an artwork can be influenced by originality, functional excellence, exemplarity for its category, art historical significance, distinguished authorship, difficult execution and timely content. Even if one could ground each of these individual dimensions of aesthetic merit in the senses, it is far from clear how they get unified into a coherent category. What makes a certain piece a good work of art? The concept that we apply these cases might be termed 'artistic goodness'. Here, the sensory element seems even less suitable to capture the intension of the evaluative concept and any unification outside the realm of the abstract hardly achievable.

Such considerations point to the conclusion that the discussed aesthetic concepts are at least, in part, abstract. One might be tempted to infer that an amodal representation is needed to capture these concepts. We think that this is wrong. In what follows, we will present a strategy for grounding evaluative concepts and resist the amodal representation approach. We cannot hope to be exhaustive here, so we will focus on two very abstract cases: *moral badness* and *aesthetic goodness*. We will then suggest some strategies for extending these examples to more specific cases in each domain.

2. Emotional grounding of value

(a) Emotional grounding

The challenge posed by evaluative concepts was well known to empiricists. Hume [21] dedicates the first part of his three-part *magnum opus* to arguing that concepts are generally grounded in perception (or, 'ideas' are grounded in 'impressions'). The final part of the book is dedicated to how we understand morality. How does he apply his version of grounded cognition to moral concepts? The answer is given by the second part, which deals with passions. For Hume, moral facts are not part of an observable, external reality, like scientific facts. Rather, they are projections onto the world, which are based on our preferences for how the world should be. These projections consist in our sentiments or emotional responses to character traits and behaviour. We have positive feelings about justice and negative feelings about murder. Hume [21] also offers an emotional approach to aesthetic values along similar lines, as do his contemporaries [22]. In summary, Hume makes three claims: cognition is grounded, evaluative concepts are projections and those projections are emotional.

Someone might object that emotions cannot serve to ground abstract concepts, because emotion concepts are themselves abstract. One frequently finds names of emotions on lists of abstract concepts. For example, Paivio & Csapo [6] include *grief* on their list. If emotions are abstract, how can they help with grounding abstract concepts? Here, we think that it is crucial to distinguish abstractness and amodality.

Emotions are abstract in the sense that they are neither objects with physical boundaries nor are they directed at any discrete and identifiable set of physical objects or properties, but they may be implemented in modality-specific codes. If so, they can help with grounding.

For Hume, emotions are inner perceptions, because he defined them as impressions of impressions; the idea is that the perception of an external event can cause a reaction in us, and that reaction is like a sensory response from within. This proposal has drifted out of popularity, but other helpful proposals have emerged in contemporary emotion theory. Some theorists have revived William James's proposal that emotions are perceptions of changes in the body [23,24], while others have emphasized a link between emotions and action tendencies [25]. We think that the views are linked. As James claimed, felt bodily changes are feelings of the body preparing for action, and the motor systems that control action are coupled with interoceptive systems that generate forward models and provide sensory feedback [26]. Sensorimotor approaches are controversial, but there is strong evidence suggesting that the emotions correlate with somatic changes [27–29]. There is also evidence that emotions are behavioural reinforcers [30]; when experiencing an emotion, one works to sustain it or its apparent cause (positive valence) or to eliminate it or its apparent cause (negative valence). Combining these ideas, we define emotions as valenced sensorimotor states that potentiate and register action tendencies. From a phenomenological perspective, emotions are experienced in terms of to-be-doneness. Fears instill an impulse to flee or freeze and anger instills an impulse to aggress. Since grounding requires that higher cognition uses sensorimotor resources rather than a proprietary amodal code, judgements based on emotions could qualify as grounded on this picture.

One might balk at the idea that emotions can function as concepts, especially if emotions are sensorimotor states. Such resistance issues from the view that concepts are used to construct sentences or propositions in the head. But grounded cognition rejects that view. Imagine seeing a predator and responding with fear. The embodied fear response presents that the bear has something to be escaped. This can be characterized as an embodied conceptualization: we represent the bear as scary using our somatic responses. We think that a similar approach can help us also to account for evaluations such as moral badness and aesthetic goodness.

(b) Grounding moral badness

Previous work on abstract concepts has emphasized simulated events and introspectable states. Barsalou & Wiemer-Hastings [31] provide empirical evidence that when describing abstract concepts, people often make reference to events (e.g. agents engaging in behaviour) and introspections (e.g. goal, intentions and beliefs). Barsalou & Wiemer-Hastings include 'affect' under introspections, and, in that sense, our approach will be an extension of theirs, but to see why emotions are so important, let us first consider whether moral badness can be explained without emotions, using events and other introspectable states.

It is tempting to treat moral badness as a concept that subsumes a wide range of event scenarios that can be perceptually simulated (e.g. hitting, pickpocketing, shoplifting, killing and bribing) along with malicious intentions (e.g. the intention to harm or steal). On this approach, one assesses whether something is morally bad by comparing it to events such as these. We think that this is an important component of moral concepts but incomplete on its own. One preliminary worry involves intentions. Barsalou & Wiemer-Hastings assume that events and intentions can be grounded, and we are inclined to agree. Intentions are a bit tricky, because it begs the question against opponents of the grounded view to simply assume that these are not amodal, but we think that there are promising strategies for proving modality-specific accounts of intentions (e.g. behavioural scripts, embodied and motivational states). A more serious worry concerns a gap that opens up between intentional actions and moral assessment. Consider someone who kills intentionally. Has she done something wrong? That depends. It may be self-defence, revenge or euthanasia. In each of these cases, the rectitude of the action depends on one's values (e.g. some people oppose all euthanasia). One can hit a would-be aggressor, one can steal to help the poor and one can bribe a Nazi official for a passport. There are also individual and cultural differences in what one regards as bad: is it okay to spank a child? To drop trash on the street? To participate in sex work? Representing such intentional actions is not sufficient for representing them as morally bad. We need a way to represent badness.

This is where emotions come in. We think that moral badness can be grounded in emotional responses. To see a case of stealing or spanking as bad, one needs to represent both the intentional event and one's negative reaction towards it. Research has identified several different emotions that play a role in negative moral judgements. For example, there is research indicating that both anger and disgust play a role. Actions regarded as immoral can induce these emotions [32], and induction of these emotions can make moral judgements more severe [33–35]. Individual differences in these emotions also correlate with variation in moral stringency [36,37]. There is also evidence that anger and disgust play somewhat different roles, with anger regulating actions that affect persons and disgust regulating actions that are perceived as unnatural [32,35]. Correspondingly, there are also two self-directed emotions, guilt and shame, which may parallel the roles of anger and disgust when one considers one's own transgressions [38]. One might define a moral value in terms of both other- and self-directed emotions. Littering is regarded as bad by someone if it disposes her to feel angry when others do it and guilty when she does it herself [39].

On a sensorimotor approach to emotions, this approach to morality can be explained in terms of bodily responses to such events. Suppose one sees a person drop trash on the street. This may result in a flash of anger, which is experienced as an impulse to approach the individual in an aggressive way, making a scowl, raising one's voice and demanding that this person pick up the trash. The impulse to aggress can be understood as akin to an affordance [40]. We directly perceive the action of dropping trash as affording a belligerent confrontation with the offender. Other moral emotions promote different behaviours: disgust promotes avoidance, guilt promotes reparative supplication and shame promotes concealment. These emotions can be analysed behaviourally as response dispositions, but they can also be analysed psychologically as evaluations: when an action impels us to aggress, shun someone, apologize or lower our heads, we are perceiving that action as bad.

Thus, the sensorimotor response is not just a behavioural reaction, it is a cognitive reaction—it is a moral evaluation. The resources we bring to bear in such an evaluation of a scene can enter into reasoning, planning, problem solving and generalization. In the littering case, one might *deduce* that the city needs more trash bins, one might *choose* to confront the offender, one might *decide* to pick up the unsightly litter and one might *infer* that many people are selfish.

Note that we are not simply proposing that bad behaviour *causes* embodied emotions. We are suggesting that these emotions can function as concepts: they can be predicated of things. The anger elicited by a polluter is a kind of construal that presents the polluter in a certain way, e.g. as someone to be confronted. Here, cause (polluter) and effect (anger) get bound into a cohesive psychological state (anger towards the polluter) that has meaning (polluter is bad).

This analysis reveals an interesting feature of moral concepts already noted by Hume [21]. Unlike some concepts that merely represent how the world is, moral concepts tell us how the world should be, and, as such they have behavioural pull. We can observe that an object is green and be indifferent to that fact, but if we observe that an object is litter, we are not indifferent. That observation motivates us to change it. The felt badness of something tells us both how it is (bad) and that something must be done to rectify it. This is an advantage of the embodied approach to grounded cognition. An amodal theory, or even a grounded theory that ignores emotions, does not predict that moral conceptualization is intrinsically motivating. This suggests that moral concepts not only can be grounded in emotions but also must be.

Theories of this kind face some objections, which we cannot fully review here [41], but we will mention two. First, one might worry that one can have an emotion such as anger or disgust without moralizing anything, as when one smacks a stubborn vending machine or smells rotting milk. We think that moralizing requires not just a single emotional response on a single occasion, but a set of emotional dispositions that include both other- and self-directed emotions. Bad behaviours are those that anger or repel us in others and also cause guilt and shame when we do them ourselves. The behaviour of a vending machine and that of rotting milk would not dispose us to experience guilt and shame; these are not behaviours we relate to by means of our ability to perform them ourselves. Second, one might object that moral judgements sometimes come apart from emotions, as when we coolly judge that a punishment is warranted despite the fact that we are upset by the pain that it causes. Here, we think that introspection may mislead us: when compassion is overridden by justice, it may not be cool reason at play, but indeed strong emotion; the act of punishment itself may not be occasioned by rage, but, in such cases, we would be enraged if justice was not meted out; we tolerate suffering in a perpetrator, because of prior outrage towards the crime or a standing disposition to find such crimes outrageous.

In summary, we propose that moral badness is grounded in other- and self-directed emotions, each of which impels certain actions. For other more specific moral concepts, such as *injustice* or *murder*, these emotions can be combined with intentional event simulations. The difference between *murder* and *killing*, for example, might be that it represents intentionally taking a life together with an emotional response. Positive moral concepts, such as *bravery*, might be explained by appeal to event scenarios couple with positive emotions, such as elevation and gratitude [42]. Other more fine-grained distinctions can be captured by appealing to contingencies upon which our moral emotions arise: an impermissible action is one that causes moral emotions when performed and a mandatory action is one that causes moral emotions when not performed. This is just a sketch of a research programme, not a detailed analysis, but we think that the evidence linking emotions to moral judgements together with evidence linking emotions to the body provides an existence proof for the idea of grounded moral evaluations and a direction for ongoing investigation.

(c) Grounding aesthetic goodness

There has been significantly less empirical work done on aesthetic concepts and values compared to the moral domain, but we believe that there is good reason to see them as grounded in bodily responses as well. We introduced aesthetic values above by giving *beauty* as a core example. *Beauty* has been the most frequent word associated with the aesthetic [43], and in a study in which participants were asked to describe the aesthetics of different object classes (faces, landscapes, patterns and visual art), *beautiful* and *ugly* were the only terms that appeared for all classes [44].

Beauty is a clear example of an aesthetic value, but there is some question as to whether it qualifies as an abstract concept. Generally, concepts become increasingly abstract the more detached they are from physical entities and the sensory domain, but beauty is experienced as a perceivable feature of objects [45]. This seems to be the case when we admire a beautiful sunset or vista, or for the first time see the marvellous fresco cycle of Giotto in the Scrovegni Chapel in Padua: beauty seems to inhere manifestly in the objects or scenes and not to be conceptualized as an abstract entity. Is beauty therefore grounded in perception in such a straightforward way? Is it a sensory concept? We think not. As we have argued above, beauty is not just an aesthetic property that is captured fully by the sensory features of objects, but plays a special role. More specifically, (i) instances of beauty do not seem to share common features or causes [46], (ii) standards of beauty seem to be malleable and culture-specific [47,48], and (iii) in the case of artistic goodness, there are not just sensory elements that feed into our evaluation of an object but cognitive considerations, such as originality, as well (for reasons of space, we will not attempt to explain how these considerations are grounded here). These are all features of abstract concepts that have been characterized as being less stable over time and more variable in terms of how they are defined [49]. Aesthetic evaluations are therefore abstract and not just based solely on sensory features perceivable in the valued objects.

This is most obvious in the case of art and its appreciation. *Artistic value* as a concept is not based on a collection or a pattern of features that we attribute to great works of art. Historical attempts of identifying such features have therefore been deemed to fail to properly capture what we value in art. This has not prevented such theories from yielding astonishing afterlives, for example, in the field of empirical aesthetics. An example is the theory that body representations of human figures in art adhering to the *golden ratio* are perceived as more beautiful [50,51]. However, the

stimulus set used in such studies was restricted to sculptures from Renaissance and Classical periods. These are art periods where such a treatment of body representation might be considered a norm. Attempts to replicate their results by including Gothic and Mannerist works therefore failed and extending the stimulus set to the twentieth century in certain cases even inversed the results [52]. This is only one example of a more fundamental observation. Art evaluation does not seem to be bound to such extrinsically definable properties, but rather tracks something that is mediated by more complex features such as art historical knowledge or contextual information. It is directed towards such properties as 'being expressive' and seems in many cases to track forms of achievement that go beyond visual forms. We therefore need another way to understand how the concept of artistic value is tracked in our engagement with art.

Our suggestion, again, is to turn to the emotions. Yet before doing so, it might be helpful to demarcate some differences and similarities to the moral domain. The valence of aesthetic concepts seems to be predominantly positive, whereas in the moral case we focus on the negative: we condemn moral violations more often than we praise moral compliance. The valence of aesthetic concepts is generally positive [43]. We therefore chose artistic goodness, as it is tracked in appreciation, as our candidate value and not artistic failure. Second, the role of emotions may be less obvious to introspection in the aesthetic case: Hume [53] claimed that the 'calmness' of aesthetic sentiments contributes to our tendency to confuse judgements such as those of beauty with a perception of the object itself. A third point refers to the link of emotions and art: it has been shown that emotional differences across individuals account for divergent preferences for styles of artworks, such as representational versus abstract art [54]. The latter marks a point of convergence with the moral domain, whereas the first two hint towards some possible differences.

The confines of this paper prohibit us from going into a detailed analysis; we instead want to propose a candidate emotion for grounding the abstract concept of artistic goodness: wonder [55,56]. Despite its philosophical significance [57,58], wonder has not attracted much attention in the literature on emotions. What makes wonder a good candidate for artistic value is that it can deliver on the two desiderata formulated above: versatility and unity. Let us start with the former. We seem to experience wonder with respect to a strikingly wide range of objects and events, either outside (e.g. staggering vistas of nature) or inside the art world (e.g. the sensory arrest through a Rothko painting, the miniscule objects in the miniature box constructions of Joseph Cornell and the complexity of the modern *Gesamtkunstwerk* in Christoph Schlingensief). But more importantly, wonder provides the ground to unify the concept in certain action tendencies: we approach art objects that fascinate us, we open our eyes and mouth, and we expand our attention to the objects that we consider great works of art. We also lower our bodies with respect to objects of wonder and want to look up to them. It has been shown that manipulating artworks with respect to dimensions that play on this sensorimotor profile changes our aesthetic evaluation of them. Hanging artworks higher or making them bigger has a positive effect on ratings; telling participants that an artwork is a masterpiece makes them perceive it as being bigger and hung higher, respectively [59].

Our analysis of wonder has certain affinities to the analysis of awe by Keltner & Haidt [60]. They too emphasize scale, and suggest that awe involves a sense of vastness or expansiveness. They also introduce a second component of awe, *accommodation*, which is an addition to what we have said so far. When an awe-inspiring event becomes too overwhelming or transcends our capacity to cope with it, it loses its positive valence. The same can account for the differences across participants with respect to the evaluation of something as aesthetically good. Artworks can be too challenging, confusing or grandiose. Whether somebody can appreciate a work of art depends on whether it challenges her in the right way and this, in turn, depends on her preferences and background. This again helps to explain the malleability of artistic value; the relation between challenge and coping potential will find different expressions across the population, while at the same time providing a unifying element in its key features that is identifiable in a specific sensorimotor profile.

What holds for the emotional tracking of artistic goodness might extend to the case of beauty and other aesthetic concepts. We will not make this case here and only hint towards some directions that we find worthwhile exploring. First of all, aesthetic concepts generally might not be learned by identifying common physical properties, but rather by applying a specific emotional profile to them. As Sibley notes 'We learn [concepts such as *lovely, pretty, dainty*] not so much by noticing similarities, but by our attention being caught and focussed in other ways' [11, p. 448]. Children learn aesthetic appreciation (and the respective aesthetic concepts) in situations in which they allocate sensory and cognitive resources to objects that stand out of the ordinary. The motivational component of addressing and exploring such objects might be best explained by the affective pull of the emotions that, as we have argued, might underlie evaluative concepts.

Second, we already alluded to the problem that *beauty* might be ambiguous and capture aesthetic goodness more generally as well as the specific sensuous pleasures that can be seen as a contributing factor to such aesthetic goodness. There might be more resources need to established whether beauty is a unified concept in the way we indicated above [61]. This relates to a final point. There are positions in the literature that claim that *beauty* occupies a special position among aesthetic concepts, because it constitutes a purely evaluative term [62]. According to such positions, beauty differs from other aesthetic concepts such as *dainty* or *dumpy* that rather denote non-evaluative properties and constitute substantive aesthetic judgements [63]. The way we conceive of the aesthetic domain as such a clear separation of evaluative and substantive aesthetic judgements seems unwarranted. Aesthetic concepts are evaluative. They might have emotional profiles that are more or less identifiable (as we aimed to show for the case of wonder and artistic goodness [55]), although we should not expect each concept to be easily related to a specific emotional blend. If our account is on the right track, those concepts will not be unified by the physical and sensory properties that are instantiated when such a concept is applied but rather by a cognitive style, action tendency and valence belonging to an emotion.

In summary, whereas moral badness is grounded in person-directed emotions that promote punitive actions such as aggression or avoidance, aesthetic goodness must be grounded in emotions that are directed at objects that

warrant sensory contemplation. We have mainly discussed that with respect to the case of *artistic goodness* and addressed how this abstract concept is applied in appreciation. The action tendencies here can be described as a kind of reverential or submissive attention; when we see something as aesthetically good, it stops us in our tracks and pulls us in. Wonder seems to have the right action tendency. Of course, much more is necessary to defend the wonder hypothesis [55,56]. Here, we are content to show that the hypothesis deserves investigation, and that it would offer an approach to aesthetic grounding that parallels moral evaluation.

3. Conclusion and future work

In this paper, we focused on the grounding of abstract concepts such as *moral badness* and *aesthetic goodness* in embodied emotions. The key link in this analysis has been that these evaluative concepts cannot be explained by accounts that focus on only properties in external objects or actions. Emotions provide a promising explanation of the missing ingredient. They explain the way that values go beyond external facts and have behavioural pull. They may also help to explain why evaluative judgements are context-sensitive and why evaluative disputes are so difficult to resolve. Here, we highlighted the sensorimotor component of emotions in order to show that they can ground abstract values without appeal to amodal concepts. We have only scratched the surface of this approach. Future work must probe the full range of emotions involved in evaluation, and it is also important to investigate specific evaluative concepts, such as injustice, which may combine emotional elements with other kinds of sensorimotor representations, such as scenario simulations. Here, we have tried to suggest that emotions will play a key role in evaluative abstractions: they capture our embodied engagement with goodness and badness.

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