

Finding the self in self-transcendent emotions

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Emotion research has something in common with a drunk searching for his car keys under a street lamp. “Where did you lose them?” asks the cop. “In the alley,” says the drunk, “but the light is so much better over here.” For emotion research, the light shines most brightly on the face, whose movements can be coded, compared across cultures, and quantified by electromyography. All of the “basic” emotions described by Paul Ekman (1) and others (happiness, sadness, anger, fear, surprise, and disgust) earned their place on the list by being face-valid. The second source of illumination has long been animal research. Emotions that can be reliably triggered in rats, such as fear and anger, have been well-studied, down to specific pathways through the amygdala (2). But emotions that cannot be found on the face or in a rat, such as moral elevation and admiration, are largely abandoned back in the alley. We know they are there, but nobody can seem to find a flashlight. It is therefore quite an achievement that, as described in this issue of PNAS, Immordino-Yang, McCall, Damasio, and Damasio (3) managed to drag an fMRI scanner back there and have given us a first glimpse of the neurological underpinnings of elevation and admiration.

To bring some order to the study of emotions, psychologists have proposed various schemes, mostly categorizations of “cognitive appraisals,” the quick analyses of the meaning of an event that are said to trigger the rest of the emotional response (4). One such scheme (5, 6) for the moral emotions proposes a 2 × 2 contrast. Moral emotions are usually evaluations (good or bad) of a person, and that person can be the self or another person. Table 1 shows the 4 cells that result from this contrast, along with the main emotions that fall into each cell. Next to each emotion word is the number of journal articles found in a recent search of the PsycInfo database. The most dramatic feature of Table 1 is that research on negative moral emotions is 15 times more common than research on positives. Another noteworthy feature is that, even on the “praiseworthy” side, the only 2 emotions with >40 articles are both closely linked to the self: pride (“I did well and think others think so too”) and gratitude (“I like people who do good things for me”). Can it really be the case that we do not have emotions about the virtues

and excellences of others, except to the extent that they help us or bond with us? Are there any emotions that transcend self-interest?

Yes, there are: elevation and admiration, as well as compassion, which we will not focus on here because it is not new; it has long been a topic of psychological discussion (7) and is now a major area of neurological work as well (8, 9). [We note, however, that compassion is often mislabeled as “empathy.” Empathy is the ability to take another’s perspective and then feel what the other feels, whether that be joy, sadness, or

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boredom. Empathy itself is not an identifiable feeling. Compassion, in contrast, is the feeling of being moved by another’s suffering (5). It is the feeling induced in the 2 compassion conditions of Immordino-Yang et al. (3), who showed images and told stories about people suffering.]

The best descriptions we have so far of the self-transcending “emotions of appreciation” (6) or “other-praising emotions” (10) come not from psychologists but from keen observers of human behavior (the former group has only partial overlap with the latter). Thomas Jefferson, for example, believed that great literature can foster a young person’s moral development by triggering powerful and “elevating” sentiments:

When any. . . act of charity or of gratitude, for instance, is presented either to our sight or imagination, we are deeply impressed with its beauty and feel a strong desire in ourselves of doing charitable and grateful acts also. On the contrary when we see or read of any atrocious deed, we are disgusted with its deformity and conceive an abhorrence of vice (11).

Jefferson noted that uplifting stories cause a visceral reaction: They “dilate [the reader’s] breast, and elevate his

sentiments as much as any similar incident which real history can furnish.” Only in the last year has any empirical evidence for elevation been published, demonstrating that moral elevation motivates people to emulate role models, do good deeds, and become more interested in relationships (10). In the strongest behavioral finding, moral elevation caused lactating women to hug and nurse their infants (12), suggesting the possible involvement of the hormone oxytocin. Something really is going on in the breast, although of course Jefferson was referring to the chest cavity more generally. Moral elevation has been defined as the emotional response to moral beauty (13).

Elevation is clearly the emotion being elicited by Immordino-Yang et al. (3) in their “admiration for virtue” condition, in which they showed participants carefully selected video clips and images relating to true stories of courage, charity, and self-sacrifice. In fact, their elicitation method deserves praise for solving a problem in elevation research: reactions to elevating stories are more idiosyncratic than are the elicitors used to study many other emotions. Nearly all participants will react with disgust to an image of excrement, but many participants are unmoved by any particular story of moral beauty. Some will find it trite. By asking each participant to pre-judge stories before entering the scanner, and then giving only brief reminder versions of each story in the scanner, Immordino-Yang, et al., were able to pack several times as many stories into a normal scanning session and were then able to limit their analyses to just those stories that each subject indicated (by button press) had produced emotional experiences while in the scanner.

Admiration is a more general term than elevation, yet here too, psychologists have conducted almost no empirical research on admiration as an emotion. [There is some work on admiration as a cognitive state, a reaction to self-comparisons with “superstars” (14).] For a good description of admiration we can turn to Darwin, a superb observer of the emotions, who defined it as “sur-

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Table 1. The main moral emotions (other than compassion), with number of articles in the PsycINFO database for which the emotion name was in the title or keywords fields

Person	Appraisal of agent's action			
	Praiseworthy		Blameworthy	
Self	Pride	247	Guilt	1,639
	Self-satisfaction	27	Shame	1,601
Other	Gratitude	124	Anger	3,230
	Admiration	36	Disgust	306
	Elevation	2	Contempt	54

Journal articles were counted only on Sept. 1, 2008. Elevation produced hundreds of hits initially; all but 2 referred to elevation as the rising of a physical object or substance.

prise associated with some pleasure and a sense of approval" (15). The Oxford English Dictionary concurs: "Agreeable surprise; wonder mingled with reverence, esteem, approbation." These 2 definitions capture the stimuli used by Immordino-Yang et al. (3) in their "admiration for skill" condition, which included video clips of people doing amazing (but nonmoral) feats, such as break-dancing or solving a Rubik's cube puzzle while blindfolded. The small amount of extant behavioral work on admiration as an emotion suggests that admiration (for nonmoral excellence) makes people feel energized and inspired to copy the role model and to go forth and succeed in their own endeavors (10, 16). Admiration, like elevation, draws people out of their ordinary state of consciousness; the related motivational state of "inspiration" involves feelings of transcendence, which has been defined as "orienting one toward something that is better or more important than one's usual concerns" (16).

If elevation and admiration really do involve feelings of self-transcendence—a reduction in attention to the often all-consuming self and its goals—then a simple-minded prediction would be that these emotions dampen brain activity in regions that map and track the self and its bodily incarnation. But the findings of Immordino-Yang et al. (3) suggest a much more interesting possibility: that

brain areas related to interoceptive processing may be more active during self-transcendence. Their study found that elevation and admiration (along with 2 kinds of compassion), when contrasted to reactions to structurally similar but nonemotional stories about other people, activated brain areas related to internal regulation (e.g., hypothalamus, mesencephalon, and anterior middle cingulate cortex) and to sensing the body (e.g., anterior insula and supramarginal gyrus). Admiration and compassion conditions, relative to neutral, also engaged the posterior cingulate, retrosplenial cortex, and precuneus, a network of structures referred to as the posteromedial cortices (PMC). In a second contrast, which they called a contrast of the more "social" conditions (admiration for virtue and compassion for social pain) with the more "physical" conditions (admiration for skill and compassion for physical pain) they found that the social conditions produced more activation in posterior/inferior PMC involved with interoceptive processing, whereas the physical conditions produced more activation in superior/anterior PMC regions critically involved in the musculoskeletal system.

Our only criticism of this study is that we are not convinced that the most relevant contrast here is social vs. physical. Such a contrast works perfectly for their 2 compassion conditions, but does not

necessarily capture the difference between admiration for virtue (i.e., elevation) and admiration for skill. Admiring a person's extraordinary skills, particularly when those skills are not about musculoskeletal excellence (e.g., a superb teacher), is very much a social emotion. We would like to see the direct contrasts among all 4 conditions, and we would like to see future studies elicit admiration for skills that do not involve so much movement. But if we assume that the contrasts between the 2 admiration conditions were similar to those reported for the merged social and physical conditions (an assumption confirmed by M. H. Immordino-Yang, personal communication), then the way is indeed open for a reading of self-transcendence that is consistent with the picture long advocated by Damasio (17). Perhaps our "higher" more cognitively complex and uniquely human emotional abilities (such as elevation and admiration) are implemented by reusing older systems, particularly systems involved in representing and managing the body itself. [Linguists have also noted that our richest metaphors tend to come from our physical embodiment (18).] Emotions with a self-transcendent or "spiritual" aspect to them, such as moral elevation, may therefore turn out to be amplifications with subtle alterations, rather than suppressions, of our carnal, embodied nature.

The findings of Immordino-Yang et al. (3) do not prove this conclusion; in fact, because of its small sample size and therefore inability to perform full contrasts among the 4 conditions, it cannot be said to have proven anything. But so what? Given that nobody has yet had the resourcefulness to explore the dark alley of these difficult emotions, this first snapshot of what might be back there is an important contribution to the study of emotions in general and affective neuroscience in particular. We admire their skill and hope others will be motivated to emulate them and extend (or contradict) their findings.

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