

# Do People Essentialize Emotions? Individual Differences in Emotion Essentialism and Emotional Experience

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Many scientific models of emotion assume that emotion categories are natural kinds that carve nature at its joints. These beliefs remain strong, despite the fact that the empirical record on the issue has remained equivocal for over a century. In this research, the authors examined one reason for this situation: People *essentialize* emotion categories by assuming that members of the same category (e.g., *fear*) have a shared metaphysical essence (i.e., a common causal mechanism). In Study 1, the authors found that lay people essentialize emotions by assuming that instances of the same emotion category have a shared essence that defines them, even when their surface features differ. Study 2 extended these findings, demonstrating that lay people tend to essentialize categories the more a category is of the body (vs. the mind). In Study 3, we examined the links between emotion essentialism and the complexity of actual emotional experiences. In particular, we predicted and found that individuals who hold essentialist beliefs about emotions describe themselves as experiencing highly differentiated emotional experiences but do not show evidence of stronger emotional differentiation in their momentary ratings of experience in everyday life. Implications for the science of emotion are discussed.

*Keywords:* psychological essentialism, emotional complexity, beliefs

Physical concepts are free creations of the human mind, and are not, however it may seem, uniquely determined by the external world.—  
Einstein & Infeld (1938)

Although he was a physicist, Einstein knew a thing or two about the human mind. He knew that scientists do not dispassionately look on the world and carve nature at its joints. Scientists are active perceivers, and like all perceivers, we see the world from a particular point of view. Psychological research has demonstrated time and time again that implicit lay theories influence how people reason about the causal structure of the world (Gelman, 2009; Medin & Ortony, 1989). Psychological essentialism, as just such a lay theory, is the inference that categories have consistent, diagnostic, surface features and a metaphysical essence that makes them what they are (Gelman, 2009; Medin & Ortony, 1989; Prentice & Miller, 2007; Rothbart & Taylor, 1992). An essence is

an unchangeable underlying property or mechanism that determines a category's identity (Aristotle & Bostock, 1994; Gelman, 2009; Medin & Ortony, 1989). People can hold strong essentialist beliefs about a category, even when they do not explicitly know what a category's essence might be (Prentice & Miller, 2007) and even when category instances differ in their surface properties (Medin & Ortony, 1989). Debates about why people essentialize exist (Gelman, 2009); that people essentialize certain categories but not others is not in question. In this report, we investigated for the first time whether people also essentialize emotion categories, and if so, whether their essentialist beliefs are linked to properties of their own emotional lives.

It is easy to see why some people might essentialize emotion. Most of us have experienced the quick heat of anger, the dragging sorrow of sadness, and the soaring delight of joy, as if they are discrete categories triggered quickly and effortlessly by our brains and in our bodies. We also automatically and effortlessly perceive emotions in other people and in nonhuman animals as easily as we read words on a page. Perhaps for these reasons, many scientific models of emotion incorporate aspects of essentialist thought into their hypotheses. Following the essentialist belief that categories have diagnostic surface features, some scientists hypothesize that each emotion category is characterized by a distinctive set of experiential, behavioral, muscular, cognitive, and autonomic responses that are coordinated in time and intensity and that distinguish instances of one category from another (for recent examples, see Ekman & Cordaro, 2011; Izard, 2011; Levenson, 2011; Panksepp & Watt, 2011; Tracy, Shariff, & Cheng, 2010). In philosoph-

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ical terms, this is the tendency to define emotions as natural kind categories, or as categories that “cut nature at its joints,” by means of analogy (Barrett, 2006a; Goodman, 1983). Following the essentialist belief that categories have an essence that causes them, still other scientists hypothesize that instances of each emotion category issue from a common cause or mechanism, such as circuits in the mammalian brain (Calder, 2003; Dolan, 2002; Ekman, 1999; Izard, 2011; MacLean, 1949; Panksepp, 2004; Papez, 1937; Vytal & Hamann, 2010), inherited mechanisms in the body (e.g., an “affect program”; Ekman & Cordaro, 2011; Tomkins, 1963), or cognitive appraisal processes that trigger diagnostic emotional responses (Ellsworth & Scherer, 2003). In philosophical terms, this is the tendency to define categories as natural kinds by means of homology (Barrett, 2006a). Other theories incorporate both aspects of essentialist thought, hypothesizing that emotion categories are defined by diagnostic surface features and a causal mechanism (Panksepp, 2004; Tomkins, 1963; Tracy, Shariff, & Cheng, 2010).

In the context of these essentialized hypotheses about emotion, other scientists have pointed out that the bulk of the experimental evidence on facial muscle movements, vocal acoustics, peripheral physiology, and brain activity does not support the idea that emotions involve diagnostic signatures of body activity, behavior, experience, or a causal mechanism in the brain or body (Barrett, 2006a; Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000; Duffy, 1941; Hunt, 1941; James, 1890; Lindquist, Wager, Kober, Bliss-Moreau, & Barrett, 2012; Mauss & Robinson, 2009; Ortony & Turner, 1990; Russell, 1994; for a historical review see Gendron & Barrett, 2009). This contrasting evidence presents the science of emotion with a quandary. Many scientists continue to stipulate that emotions are natural kind categories, even as empirical evidence is not consistent with this view. One possibility, of course, is that emotion categories will be revealed as natural kinds once the field has better measures and improved experimental methods. Another possibility is that emotions are not natural kinds but that scientists continue to seek diagnostic patterns or a causal mechanism of anger, disgust, fear, and so forth because they essentialize those categories.

In Study 1, we assessed whether people tend to essentialize emotions as they do other social categories such as stereotypes (Yzerbyt, Rocher, & Schadron, 1997), race (Haslam, Rothschild, & Ernst, 2000), gender (Gelman & Taylor, 2000), mental illness (Haslam & Ernst, 2002), personality (Haslam et al., 2000), and homosexuality (Haslam & Levy, 2006). In particular, we tested whether participants (i.e., college students) do, in fact, hold essentialist beliefs about emotion categories (e.g., “anger,” “fear”), natural categories (e.g., “pine trees,” “water”), and nominal categories created by society (e.g., “government,” “husband”). We predicted that essentialist beliefs about emotions, natural categories, and nominal categories would be defined by variation in the tendency to view categories as possessing homology (i.e., a biological causal mechanism or essence) and analogy (i.e., similar surface features that provide inductive potential). In particular, we expected that natural categories would be judged to be high in both homology and analogy. We predicted that emotions would be perceived to have homology and, perhaps, analogy (we did not have strong hypotheses about analogy because while “basic” emotion theories stipulate that emotion categories are characterized by both homology and analogy, “causal appraisal” theories only stip-

ulate homology; see Barrett, 2006a). Finally, we predicted that nominal kinds have neither homology nor analogy.

Building on Study 1, in Study 2 we tested the hypothesis that when people believe a category is more physical, it will be essentialized more than when they believe it to be mental. Using measures of homology and analogy derived from Study 1, we predicted that people would hold the strongest essentialist beliefs for body states and the weakest for cognitions, with emotions falling somewhere in the middle.

In both Studies 1 and 2, we investigated individual differences in the tendency to essentialize, based on our observation that in the emotion literature, some theorists tend to essentialize emotions more than do others. In Study 3, we explicitly examined the link between a person’s tendency to essentialize emotion and the structure of that person’s own emotional life. Specifically, we investigated whether people who essentialize emotions do so because their emotional experiences are highly differentiated during daily life. People who have highly differentiated experiences of emotion experience their emotions in a *granular* fashion, such that emotions such as anger, disgust, fear, and sadness are each experienced as discrete and distinctive experiences that tend not to co-occur with one another across contexts. By contrast, people who have less differentiated experiences might experience anger, disgust, fear, and sadness as interchangeable states that co-occur across contexts, meaning that they are more likely to feel a general state of high arousal–low arousal or unpleasantness–pleasantness than a discrete emotion (Barrett, 1998; Barrett, Gross, Christensen, & Benvenuto, 2001; Demirlap et al., 2012; Tugade, Fredrickson, & Barrett, 2004; see Lindquist & Barrett, 2008b, for a discussion). Following findings that beliefs and heuristics influence retrospective and general ratings more than online ratings of emotion (Barrett, 1998; Robinson & Barrett, 2009; Robinson & Clore, 2002), we reasoned that people who essentialize emotion might be likely to characterize themselves as having highly differentiated emotions when describing the structure of their experience with a general, retrospective questionnaire (the Range and Differentiation of Emotional Experience Scale; Kang & Shaver, 2004). By contrast, we predicted that essentialist beliefs might not relate to participants’ actual degree of emotional granularity, which is computed from online ratings of emotional experience throughout daily life (Barrett, 1998; Robinson & Barrett, 2009; Robinson & Clore, 2002).

## Study 1

In Study 1, we tested for the first time whether people essentialize emotion. We did so by adapting a questionnaire from Haslam, Rothschild, and Ernst (2000) that assesses nine aspects of essentialist beliefs. In particular, Haslam et al. asked participants about the degree to which they believed that social categories are *discrete*, *uniform*, *natural*, *immutable*, *stable*, *exclusive*, and have *informative* value, *inherent* qualities, and *necessary* features (see Table 1 for descriptions); these aspects are commonly discussed in psychological, philosophical, and social science writings about essentialism (e.g., McGarty, Haslam, Hutchinson, & Grace, 1995; Rothbart & Taylor, 1992; Yzerbyt et al., 1997; cf. Haslam et al., 2000). We also added a 10th dimension to assess people’s belief that a category is perceiver independent versus invented by a culture (i.e., is *preexisting* vs. *nominal*).

Table 1  
Dimensions on the Essentialism Questionnaire and Scale Anchors

Dimension	Question, scale anchors, and example
Discreteness	The category boundaries are . . . very clear cut vs. somewhat clear cut vs. fuzzy <i>Example: Membership within the category "wood" is clear cut. Items either are or are not composed of wood. The category of "soft," however, is fuzzy. Some things (a pillow) are softer than others (a dog) and are therefore more likely to belong to the category</i>
Uniformity	The category members share . . . many features vs. some features vs. no features <i>Example: Members of the category "fish" have many common features (i.e., they all swim, they all have scales). Members of the category "government," on the other hand, often differ greatly from one another (i.e., some are ruled by 1 person, some are ruled by a group of people, some have elected rulers and some do not).</i>
Informativeness	The category tells you . . . a lot of information about its members vs. some information about its members vs. no information about its members <i>Example: Knowing that a cat is a member of the "mammal" category tells us a lot about that animal (i.e., it nurses its young, that it has fur, etc.). In contrast, knowing that someone is a member of the category of "Canadian" tells us relatively little about that person.</i>
Naturalness	The category is . . . natural vs. sometimes natural sometimes artificial vs. artificial <i>Example: The category "birds" is more natural than the category "furniture."</i>
Immutability	Members of the category are . . . not easily changed into members of another category vs. somewhat easily changed into members of another category vs. easily changed into members of another category <i>Example: Members of the "Blood Type A" category cannot become members of the "Blood Type O" category. Members of the "student" category can become members of the "lawyer" category, however.</i>
Stability	Members of the category are . . . the same from one instance to the next vs. somewhat the same from one instance to the next vs. different from one instance to the next <i>Example: Members of the category "fruit" are stable from one instance to the next. Members of the category fruit have always existed and have not changed much throughout history. Members of the category "money," have not always existed, however, and have changed a lot throughout history.</i>
Inherence	Members of the category . . . have an underlying reality that makes them what they are vs. somewhat of an underlying reality vs. no underlying reality <i>Example: Members of the category "dog" have similarities and differences on the surface (all dogs have tails, but some are shorter or longer), but underneath dogs are basically the same (they all have certain genes). Members of the category "bottle" have differences on the surface, but there is also no underlying reality that makes them the same (bottles can be made of plastic, glass, wood, stone, etc.).</i>
Necessity	Members of the category have . . . necessary features vs. somewhat necessary features vs. no necessary features <i>Example: Books have necessary features (print or pictures, pages, binding). Without these characteristics, they are not books (an item that has print or pictures and pages but not a binding could be a newspaper). The category of "chair," however, does not have any characteristics that are necessary for membership because there are a wide variety of things that can be used as chairs (a sofa, a desk chair, a stump, a rock, a turned over wastebasket).</i>
Exclusivity	Members of the category are . . . never members of another category vs. sometimes members of another category vs. always members of another category <i>Example: The category "tiger" has mutually exclusive members because a Bengal tiger could never be a member of the "skunk" category. On the other hand, members of the category "furniture" are not mutually exclusive because an ottoman can be considered a chair in one context and a table in another.</i>
Preexistence	Members of the category are . . . discovered vs. sometimes discovered and sometimes named by a culture vs. named by a culture <i>Example: Members of categories like trees, physical elements, and animals have been discovered in the known universe. Members of categories such as sports, holidays, and college, on the other hand, exist because cultures create them.</i>

*Note.* The example provided was used in Studies 1 and 3. The examples provided in Study 2 were similar but pertained exclusively to mental state categories.

Because some researchers define emotions as natural kinds by analogy (i.e., as having similar surface features and inductive potential) and other researchers define emotions as natural kinds by homology (i.e., as having an inherent, natural, causal mechanism), we predicted that our participants' responses would reveal these two factors. In particular, we predicted that people would rate natural kind categories such as plants (e.g., "pine trees"), animals (e.g., "elephants"), and physical substances (e.g., "water") highly on analogy (i.e., having similar exemplars or instances within a category) and homology (i.e., having specific mechanisms that cause the instances within a category). We predicted that abstract, nominal kind categories such as social roles (e.g., "doctors") and social institutions (e.g., "government"), on the other hand, would be rated as low in analogy and homology. Finally, because both "basic emotion"

and "causal appraisal" scientific frameworks on emotion define emotions as natural kind categories by homology, we predicted that emotion categories (e.g., "anger," "disgust," "love") would be rated highly on homology. We did not make specific predictions about whether emotions would be defined as natural kind categories by analogy, because "basic emotion" approaches stipulate that instances of emotion within a category are similar (and therefore analogous), whereas "causal appraisal" approaches do not (Barrett, 2006a).

## Method

**Participants.** Seventy-one undergraduate students from Boston College (41 female, 30 male) participated for course credit or for \$5.00.

**Measures.** Participants each completed a paper-and-pencil essentialism questionnaire while seated in an individual laboratory room. A trained research assistant sat outside the room to answer any questions that participants might have about the survey. The questionnaire asked participants to rate 40 categories on 10 dimensions of essentialism (see Table 1 for dimension descriptions and scale anchors; also see Haslam et al., 2000). There was no cover story for the study and participants were merely asked to indicate their thoughts about different types of categories. The categories were chosen by members of the lab to represent natural categories (e.g., “snakes,” “water,” “pine trees”), emotion categories (“fear,” “disgust,” “love”), and nominal kind categories that were relatively more abstract (“treaty,” “marriage,” “competition”) versus concrete (“doctor,” “teammates,” “money”) (i.e., categories differed in the extent to which they were tangible: visible, touchable, etc.). See Table 2 for a full list of the categories used.<sup>1</sup> The examples of natural kinds, emotions, and abstract and concrete categories were only included in the study if three researchers (two of whom were involved in the project and one of whom was not)

Table 2  
Categories Included in Studies 1–2

	Category	Type
Studies 1 and 3	Natural Kinds	Attraction
		Elephants
		Hunger
Nausea		
Nuts		
Pine trees		
Thirst		
Tomatoes		
Snakes		
Water		
Emotions		Anger
		Disgust
		Fear
	Happiness	
	Jealousy	
	Love	
	Pride	
	Sadness	
	Shame	
	Surprise	
	Concrete nominal kinds	Colleague
		Doctor
		Husband
Money		
Mother		
Parliament		
Peer		
Sports fans		
Student		
Teammates		
Abstract nominal kinds		American
		Competition
		Court
	East	
	Intimidation	
	Marriage	
	Mentorship	
	Society	
	Trust	
	Treaty	

(table continues)

Table 2 (continued)

	Category	Type	
Study 2	Body states	Awake	
		Cold	
		Discomfort	
		Hearing	
		Hunger	
		Pain	
		Pleasure	
		Sight	
		Sleepy	
		Smell	
		Taste	
		Thirst	
		Tickle	
	Touch		
	Emotions	Anger	
		Contentment	
		Disgust	
		Excitement	
		Fear	
		Happiness	
		Joy	
		Pride	
		Sadness	
		Shame	
		Surprise	
		Cognitions	Daydreams
			Decisions
	Ideas		
	Judgments		
	Meditations		
	Memories		
	Morality		
	Plans		
	Reflections		
	Self-control		
	Speculations		
	Thoughts		

unanimously agreed that they were representative of the intended domain.

The emotion categories chosen included the ones that some researchers hypothesize to be biologically “basic” and universal across all cultures (e.g., anger, disgust, fear, happiness, sadness, surprise; Ekman et al., 1987). Other researchers (Lindquist & Barrett, 2008b) argue that these categories are cognitively but not biologically basic (as in Rosch, 1973). Either way, we reasoned that these were the emotion categories that would be most likely to be essentialized. We also included so-called “self-conscious” emotions (e.g., pride, shame, jealousy) because these have received interest in the literature on emotion of late and are considered to be natural kinds by some researchers (Tracy & Robbins, 2007). Natural kind categories were chosen as a comparison group for emotions because these categories are thought to have firm per-

<sup>1</sup> Following Haslam et al. (2000), we used plural nouns where grammatically correct (e.g., we used the term *pine trees* but not *waters*). It remains a question for future research whether the grammatical form of the word affects essentialism. Nonetheless, our findings suggest that participants were equally as likely to essentialize categories when in the plural form (e.g., pine trees) as when in the singular form (e.g., water; See Figure 1).

ceptual boundaries and to have little grounding in social learning. Nominal kind categories were chosen as a comparison group for emotions because these categories are thought to have relatively diffuse perceptual boundaries and have grounding in social learning. We included both abstract and concrete nominal kinds because we reasoned that it was possible that the extent to which a category is concrete and, thus, easily imaginable as a physical object would influence the extent to which it is essentialized. Including both types of nominal categories, thus, allowed us to explore whether participants perceived emotions to be like nominal categories and if so, whether they perceived them to be relatively more abstract, intangible, nominal categories versus concrete, tangible, nominal categories.

Ratings were made on a scale from 1 to 7, with scale anchors specific to each dimension (see Table 1). Participants could also indicate that they were unsure about their answer and, thus, skip an item by rating an 8 on the scale. Before participants were asked to rate the categories, every dimension was introduced with a short explanation followed by an example (see Table 1). All participants understood instructions and were able to complete the questionnaire without difficulty.

## Results and Discussion

**Measuring essentialism.** Ratings were aggregated across participants into a mean rating for each item for all 40 categories. Mean ratings for each item for each category were analyzed with a principal components analysis. Following Haslam et al. (2000), a two-component solution gave the best fit to responses, explaining 92% of the variance (other solutions had eigenvalues less than 1). See Table 3 for Varimax rotated loadings<sup>2</sup> and Figure 1 for a plot of component loadings. As predicted, the first component (*analogy*) referred to the tendency to believe that all exemplars of a category share similar surface features that provide predictive information about the purpose or meaning of a category (i.e., “inductive potential”; Gelman, 2009). Also as predicted, the second component (*homology*) referred to the degree to which category members were thought to have a core property that makes them what they are (i.e., an “essence placeholder”; Medin & Ortony, 1989).

Our findings fit well with our a priori predictions (based on philosophical discussions) regarding the attributes that people believe to characterize natural kind categories. The first component

of our solution, analogy, fit well with our a priori hypothesis that people believe the instances of natural kind categories share some similarity in surface features; members of categories are believed to have uniform and immutable properties that afford information (i.e., inductive potential) about that category (Gelman, 2009). Our analogy component consisted of the dimensions of discreteness, informativeness, uniformity, necessity, and immutability, and it was similar to the entiativity component observed by Haslam et al. (2000), which consisted of informativeness, uniformity, inherence, and exclusivity.

The second component of our solution, homology, was also consistent with our hypothesis that people believe the instances of a natural kind category have an essence that makes them what they are. Our homology component consisted of naturalness, preexistence, stability, and inherence, and it was most similar to Haslam et al.’s natural kind component, which comprised the dimensions of discreteness, naturalness, immutability, stability, and necessity. Of course, unlike Haslam et al., we did not believe that this component exclusively represented natural kind beliefs, since a person can perceive a category to be a natural kind by virtue of analogy as well (Barrett, 2006a).

The components we observed had several small differences to the components identified by Haslam et al. (2000), possibly because our study included a broader range of categories (i.e., natural kinds, nominal kinds, and emotions), whereas Haslam et al. focused their analyses exclusively on social categories (i.e., nominal kinds). In addition, our questionnaire included a new dimension, preexistence (i.e., the extent to which a category is perceived independent vs. invented by a culture), which would have changed the factor loadings on the components we observed. For example, unlike Haslam et al. (2000), we did not find that the dimension of exclusivity loaded specifically to either of our observed components (loadings were .62 and .63 for homology and analogy, respectively). The dimension of exclusivity measured the extent to which category membership was mutually exclusive (i.e., being a member of one category precludes an exemplar from being a member of another category; e.g., an instance of fear cannot simultaneously be an instance of anger). One possibility for our finding is that exclusivity is equally important to judging natural kinds by analogy (anger can never be fear because their surface features are so uniform and discrete that one could never pass for another) as to judging natural kinds by homology (anger can never be fear because they both have unique essences that make them what they are). More generally, exclusivity might be less relevant to distinguishing natural kinds, nominal kinds, and emotions than for distinguishing the social categories included in Haslam et al. (2000; e.g., it makes more sense to ask “can a doctor ever be elderly?” than “can an elephant ever be a pine tree?” or “can anger ever be fear?”). For these reasons, exclusivity was not diagnostic as a dimension of essentialism, and we do not discuss it further in this article.

**People believe emotions are natural kinds.** We next computed analogy and homology scores for each category by using a unit-weighting approach. We performed a one-way analysis of variance (ANOVA) with the analogy scores as dependent variables

Table 3  
Varimax Component Loadings

Element	Homology	Analogy
Naturalness	<b>.98</b>	.01
Preexistence	<b>.97</b>	.18
Stability	<b>.80</b>	.51
Inherence	<b>.80</b>	.54
Discreteness	-.12	<b>.94</b>
Informativeness	.34	<b>.92</b>
Uniformity	.33	<b>.92</b>
Necessity	.49	<b>.85</b>
Immutability	.31	<b>.83</b>
Exclusivity	.62	.63

Note. Boldface indicates items that loaded highly on each component.

<sup>2</sup> An oblique rotation including all 10 elements did not fit the data better than the varimax rotation.

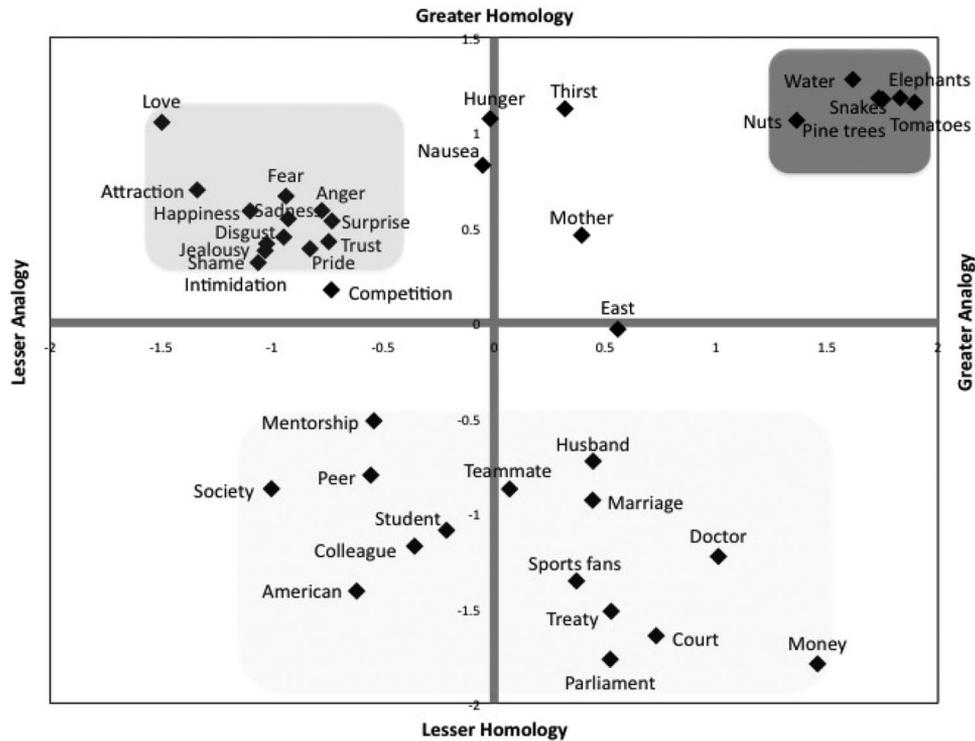


Figure 1. Categories loaded onto two orthogonal components. Emotions (in the left upper quadrant) loaded positively on homology but not analogy. Natural kinds (in the right upper quadrant) loaded positively on homology and analogy. Concrete and abstract nominal kinds (in the lower two quadrants) loaded negatively on homology and spanned the analogy component.

and the category type (nominal abstract, nominal concrete, emotion, and natural) as the independent variable. We also performed a similar analysis with homology scores as the dependent variable. All post hoc tests were Bonferroni corrected.

**Analogy.** Analogy scores were significantly different across category types,  $F(3, 36) = 15.49, p < .001, \eta_p^2 = .56$  (see Figure 2). Although we did not have strong a priori predictions regarding whether people believed that instances of an emotion category were similar to one another, we found that emotion categories were thought to contain instances that were less similar to one another than were the instances of concrete nominal kinds (e.g., doctors;  $p < .05$ ) and natural kinds ( $p < .001$ ; see Figure 2). Lay people, thus, recognize that emotions possess the sort of variability that other researchers have highlighted and discussed in their theoretical and empirical articles (Barrett, 2006a, 2009; Mauss & Robinson, 2009). Even basic emotion researchers who stipulate that instances within an emotion category are strongly analogous (e.g., Buck, 1999; Ekman & Cordaro, 2011; Izard, 2011; Levenson, 2011; Panksepp, 2004) acknowledge that observed responses might differ in their surface features; these researchers have, thus, proposed mechanisms such as display rules (e.g., Matsumoto, 1990) to explain how latently identical responses can show variability in their manifest form.

By contrast, people believed that the degree of analogy in emotion categories was similar to that characterizing more abstract nominal categories (e.g., governments). On the whole, abstract and concrete nominal kinds did not differ in terms of analogy ( $p = .48$ ;

see Figure 2), but abstract nominal kinds clustered mainly on the low side of the analogy dimension, and concrete nominal kinds clustered mainly on the high side of analogy dimension (see Figure 1). This finding suggests that the extent to which category members are easily imaginable as physical objects influences the extent to which the category is essentialized. Because emotion categories are judged by participants to be more similar to abstract nominal kinds than concrete nominal kinds, these findings suggest that participants perceive emotions less as concrete instances and as more contextual in nature (also see Wilson-Mendenhall, Barrett, & Barsalou, in press; Wilson-Mendenhall, Barrett, Simmons, & Barsalou, 2011). As expected, people believed natural kind categories were characterized by significantly more analogy than were both abstract and concrete nominal kind categories ( $ps < .01$ ).

In addition to these mean differences, we also identified individual differences in the tendency to perceive that emotions had analogy. We calculated a unit weighted analogy score for each participant, for each individual category. We next computed a difference score by subtracting the analogy score for natural categories from the score for emotion categories. Difference scores that exceeded +1 points on the 7-point scale were considered evidence that participants believed that the instances of an emotion category (e.g., anger, sadness, or fear) were more analogous than instances of natural kind categories (e.g., pine trees or snakes). Difference scores that exceeded -1 points on the 7-point scale were considered evidence that participants believed that the instances of emotion categories were less analogous than instances

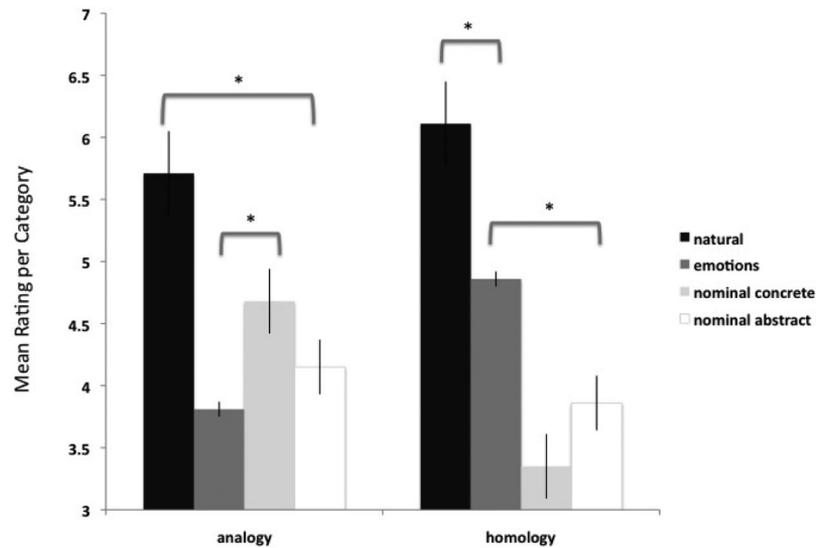


Figure 2. Mean ratings of natural kinds, emotions, concrete nominal kinds and abstract nominal kinds on analogy and homology in Study 1 (bars represent SE).

of natural kind categories. Scores that were less than  $\pm 1$  point were considered evidence that participants viewed emotion categories as being essentialized in a similar manner to known natural kind categories. It is not surprising that 87% of participants believed that instances of an emotion category were less similar to one another than instances of a natural kind category (see Figure 3).

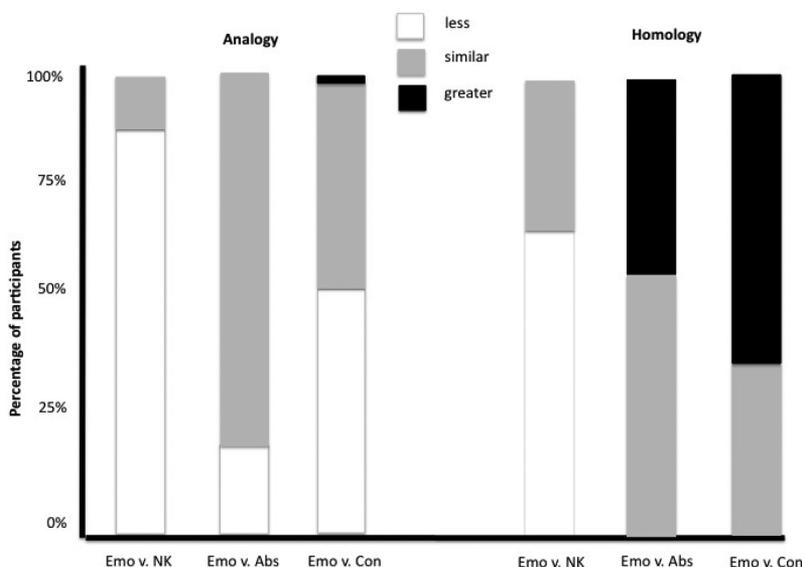
**Homology.** As predicted, homology scores also differed significantly across category types,  $F(3, 36) = 39.94, p < .001, \eta_p^2 = .77$  (see Figure 2). People rated emotion categories as more likely to have an essence than concrete nominal kind categories ( $p < .001$ ) and abstract nominal kind categories ( $p < .01$ ), but they believed that emotions had less of an essential nature when compared with natural categories ( $p < .001$ ; see Figure 2). People believed that natural categories were defined by homology more than were concrete and abstract nominal kind categories ( $ps < .001$ ). Thus, as we predicted, these findings suggest participants tend on average to essentialize emotions by assuming that they have a biological causal mechanism or essence that defines them.

Using the strategy explained above, we next documented individual differences in the belief that emotions have an essence (see Figure 3). For instance, over one third of participants believed that emotion categories were natural kind categories defined by homology. It is interesting that the people who believed most strongly that natural kind categories were characterized by homology also essentialized emotion categories more ( $r = .383, p < .001$ ), but essentialized concrete nominal kinds less ( $r = -.398, p < .001$ ). These findings confirm that people tend to essentialize categories that they perceive to be more naturalistic or as having a biological cause (cf. Prentice & Miller, 2007). We further explored this possibility in Study 2, where we investigated whether mental state categories associated with the body (i.e., categories more tightly linked with a biological origin) are more likely to be essentialized than mental state categories associated with the mind (i.e., categories less tightly linked with a biological origin).

## Study 2

In Study 2, we expanded on the findings of Study 1 by comparing people's tendency to essentialize emotion categories to their tendency to essentialize other mental state categories. Participants were asked to rate mental state categories that pertained to bodily states (e.g., hunger, thirst), emotions (e.g., anger, fear) or cognitions (e.g., memories, thoughts) on the questionnaire used in Study 1. See Table 2 for the categories used.<sup>3</sup> Study 2 ruled out the hypothesis that participants in Study 1 only considered emotions to have an essence when comparing them with nominal kind categories like governments, husbands, and so forth. Moreover, Study 2 allowed us to begin to explore why some people believe that emotions are essentialized categories. Emotions involve bodily changes, although measures of peripheral physiology during emotion demonstrate that these changes are neither specific nor unique to certain emotion categories (Barrett, 2006b; Cacioppo et al., 2000; Mauss & Robinson, 2009). Nevertheless, we predicted that the involvement of the body during emotion might lead people to believe that every emotion category has a unique biological origin (for a discussion of beliefs about biological origin and natural kindness, see Prentice & Miller, 2007). If this were the case, we

<sup>3</sup> As in Haslam et al. (2000) and Study 1, we used plural nouns where grammatically correct (e.g., we used the term *thoughts* but not *angers*). Because of grammatical conventions, cognition categories were more likely than emotion categories to be pluralized. Although it remains a possibility that the form of the word influences essentialism, we think it is unlikely that pluralizing cognition categories caused them to be less essentialized than emotions; pluralization was unrelated to essentialist beliefs about natural kinds in Study 1 (natural kinds were essentialized regardless of whether they were pluralized or not). If anything, natural kinds were more likely to be pluralized than nominal kinds and emotions in Study 1 and were the most essentialized categories of all.



*Figure 3.* Percentage of participants endorsing whether emotions (Emo) are similar or different from natural kinds (NKs), abstract nominal kinds (Abs), and concrete nominal kinds (Con) in homology or analogy in Study 1. White indicates the percentage of participants who believed that a given category (e.g., emotions) has less homology or analogy than another category (e.g., natural kinds). Gray indicates the percentage of participants who believed that a given category (e.g., emotions) has a similar degree of homology or analogy than another category (e.g., natural kinds). Black indicates the percentage of participants who believed that a given category (e.g., emotions) has a greater degree of homology or analogy than another category (e.g., natural kinds).

hypothesized that participants should engage in a kind of dualism,<sup>4</sup> essentializing mental states that are commonly associated with the body (e.g., visceral states, sensations, and emotions) more so than states commonly associated with the mind (e.g., cognitions such as thoughts or memories).

## Method

**Participants.** Seventy-nine undergraduate students from Boston College participated in this study for a \$5.00 gift certificate or for credit.<sup>5</sup>

**Measures.** Participants each completed the questionnaire (this time in computerized form) that was accessed from the study pool website at the university. The survey was administered and responses were recorded via Survey Monkey software (1999–2011 <http://www.surveymonkey.com>). Participants were asked to rate 38 categories on the dimensions of essentialism used in Study 1. Bodily state categories were types of sensations or internal feelings and were selected by our research team because they represented different modalities of sensation (e.g., sight, tickle) as well as biological sensations that are not typically considered to be emotions (e.g., thirst, hunger). Emotion categories were many of the same discrete emotional states that were included in Study 1 (e.g., anger, fear, disgust, but also additional positive emotions that were not included in Study 1 such as joy, contentment, excitement). Cognition categories were mental states associated with thinking, planning, and remembering (e.g., ideas, reflections, daydreams, decisions) and were selected, in part, based on previous research assessing the types of cognitive states that are attributed to other minds (H. M. Gray, Gray, & Wegner, 2007; K. Gray & Wegner, 2009).

**Data analysis.** Unit-weighted analogy and homology scores were calculated based on the components derived in Study 1. We performed a one-way ANOVA with the analogy scores as dependent variables and the category type (bodily states, emotions, and cognitions) as the independent variable. We also performed a similar analysis with homology scores as the dependent variable. All post hoc tests were Bonferroni corrected.

## Results and Discussion

As in Study 1, we found that participants tended to essentialize emotion categories by inferring that category instances have a biological essence. As predicted, dualistic assumptions appeared to guide beliefs about essentialism because participants in Study 2 were more likely to essentialize mental state categories that more centrally involved the body. Analogy scores significantly differed across category type,  $F(2, 35) = 130.00, p < .001, \eta_p^2 = .88$  (see Figure 4). As predicted, instances of the same emotion category were thought to be significantly more similar than were instances of the same cognition category ( $p < .001$ ), but significantly less similar than were instances of the same body state category ( $p < .001$ ; see Figure 4). Using the same method as in Study 1, we found individual differences in analogy, such that around 75% of participants thought the instances of an emotion category (e.g.,

<sup>4</sup> Dualism is the tendency to view mind and body as distinct substances (Descartes, 1641) and like essentialism, is a heuristic that emerges early in development (Bloom, 2004).

<sup>5</sup> Gender was not collected due to a computer programming error. The sample was drawn from the greater Boston College population, which is on average, 52% female.

anger) possess a similar degree of similarity as instances of a bodily state category (e.g., hunger; see Figure 5).

As predicted, homology scores also significantly differed across category types,  $F(2, 35) = 219.76, p < .001, \eta_p^2 = .93$  (see Figure 4). On average, participants were significantly more likely to believe that emotion categories had an essence than cognitions ( $p < .001$ ) but significantly less likely to believe that emotion categories had an essence than bodily states ( $p < .001$ ; see Figure 4). Again, we also observed individual differences. Using the same method as in Study 1, we found that over half of participants essentialized emotion and body categories in a similar manner (see Figure 5).

**Comparison of mental states, natural kinds, and nominal kinds.** To compare cognition and bodily state categories to nominal kind and natural kind categories, we performed analyses on the combined data from Studies 1 and 2. Because emotion categories were included in both studies, ratings from both studies were averaged for each dimension (see Figure 6). Homology scores were significantly different across category type,  $F(5, 72) = 63.49, p < .001, \eta_p^2 = .81$ . Post hoc tests demonstrated that emotion categories were characterized as less homologous than were body states and natural kinds but as more homologous than were cognitions, abstract nominal kinds, and concrete nominal kinds (all  $ps < .001$ ). Analogy scores were also significantly different across category types,  $F(5, 72) = 14.97, p < .001, \eta_p^2 = .51$ . Post hoc tests demonstrated that emotion categories had less analogy than body states and natural kinds (see Figure 6).

### Study 3

In Study 3, we examined how individual differences in emotion essentialism were related to participants' judgments of and actual experiences of emotion differentiation. Emotion differentiation is the tendency to experience emotions as nuanced, distinctive states, and is generally considered a measure of emotional complexity (Lindquist & Barrett, 2008b). We measured emotion differentiation in two ways. First, participants rated the extent to which they

generally characterized themselves to be someone who has highly differentiated emotion experiences using a personality-type questionnaire (the Range and Differentiation of Emotional Experience Questionnaire; RDEES; Kang & Shaver, 2004). We also measured emotion differentiation as *emotional granularity*, which was computed based on participants' momentary, online reports of emotion experience collected across a 1- to 2-week computerized experience sampling study. During experience sampling, participants carried a personal computerized device throughout the day and rated their emotional experiences on 39 different emotional adjectives (see Table 4) at 10 randomly determined times from 8 a.m. to 11 p.m. (for examples of experience sampling studies, see Barrett, 2004; Demirlap et al., 2012; Tugade et al., 2004). Individuals who were high in granularity showed a low degree of correlation between same-valence emotional adjectives across instances—that is, they treated emotional adjectives of the same valence (e.g., anger, disgust, fear) as distinct and differentiated states that tended not to co-occur across sampling instances (e.g., at some measurement moments, a person might report feeling angry, but not sad, fearful, disgusted, etc.; on other sampling instances, the person might report feeling all these negative emotions, making the overall correlation between emotions across sampling instances close to zero). By contrast, individuals who were low in granularity showed a high degree of correlation between same-valence emotional adjectives across instances—they treated emotional adjectives of the same valence (e.g., anger, disgust, fear) as nondistinctive, undifferentiated states that reliably co-occur with one another across sampling instances (e.g., each time individuals report being angry, they also report being sad, fearful, disgusted, etc.). The correlations between ratings is, thus, close to the reliability of the measure itself, indicating there is no differentiation between these states. Whereas the RDEES asks people to self-reflectively characterize their level of emotion differentiation, emotional granularity is a behavioral measure by which researchers can observe the degree of differentiation.

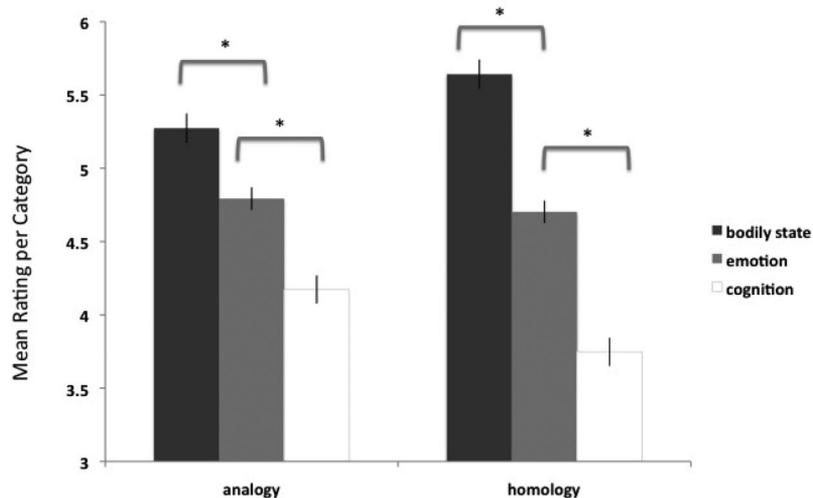


Figure 4. Mean ratings of bodily states, emotions, and cognitions on analogy and homology in Study 2 (bars represent SE).

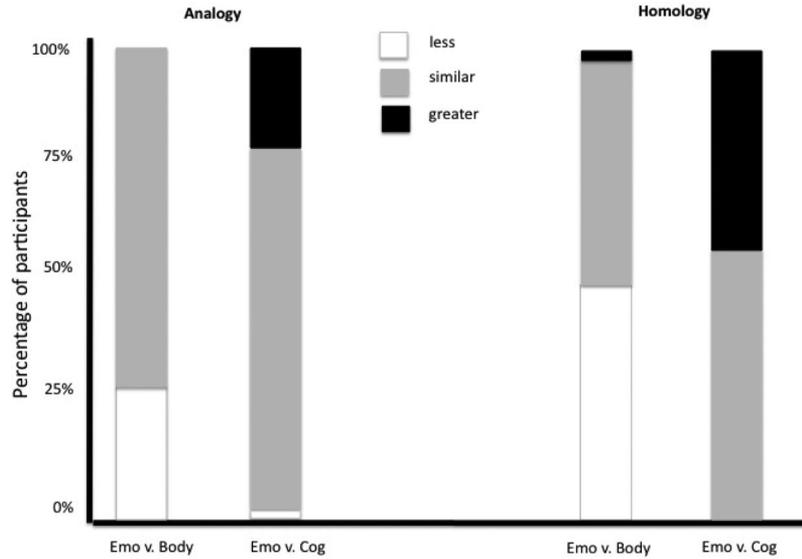


Figure 5. Percentage of participants endorsing whether emotions (Emo) are similar or different from body states (Body) or cognitions (Cog) in homology or analogy in Study 2. White indicates the percentage of participants who believed that a given category (e.g., emotions) has less homology or analogy than another category (e.g., natural kinds). Gray indicates the percentage of participants who believed that a given category (e.g., emotions) has a similar degree of homology or analogy than another category (e.g., natural kinds). Black indicates the percentage of participants who believed that a given category (e.g., emotions) has a greater degree of homology or analogy than another category (e.g., natural kinds).

By measuring both retrospective reports as well as online reports of emotion differentiation, Study 3 allowed us to begin to consider whether essentialism is an accurate reflection of participants' emotional experiences. We reasoned that if essentialist beliefs are derived from real experiences of emotion, then individuals who essentialize emotions might report experiencing emotions in a differentiated manner on the RDEES and demonstrate

emotional granularity in daily life. However, if essentialist beliefs are part of a personal theory or heuristic about the nature of emotion, as we predict, then essentialist beliefs should be related to beliefs about emotion differentiation in general (as measured by the RDEES) but not to emotional granularity in everyday life. Research demonstrates that personal theories and beliefs influence participants' self-characterizations of their experiences when

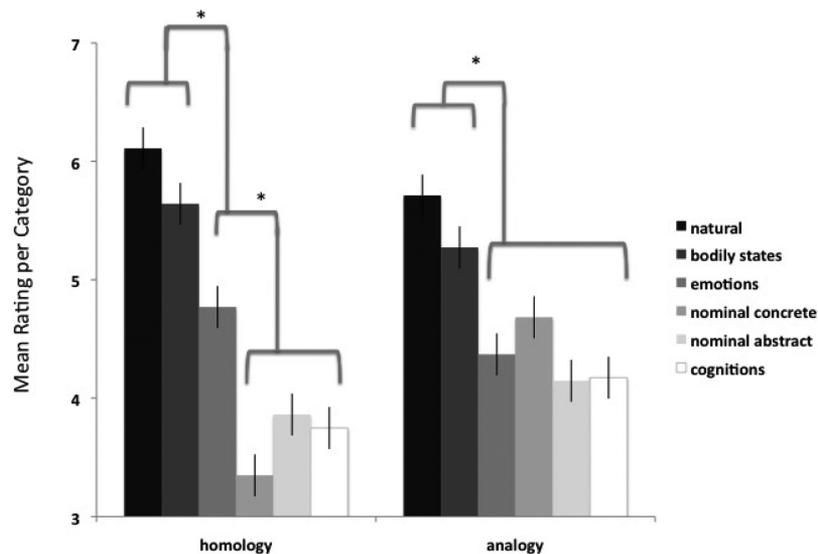


Figure 6. Mean ratings on essence and similarity for the six category types included in Studies 1 and 2 (bars represent SE).

Table 4  
*Experience Sampling Adjectives*

Intense	Moderate	Weak
furious	angry	irritated
hateful	contemptuous	scornful
terrified	fearful	nervous
repulsed	disgusted	distaste
depressed	sad	down
remorseful	guilty	sorry
content	calm	peaceful
admiring	grateful	appreciative
shocked	amazed	surprised
superior	prideful	successful
joyous	happy	amused
elated	excited	enthusiastic
bored <sup>a</sup>	restful <sup>a</sup>	relaxed <sup>a</sup>

<sup>a</sup> adjectives included to fully sample all aspects of affective space.

asked to report them “in general” or in aggregated form over a period of time, whereas personal theories and beliefs are less likely to influence online ratings of emotion (i.e., how a person feels in a given moment of time; e.g., Barrett, 1998; Robinson & Barrett, 2009; see Robinson & Clore, 2002). Because there are a number of theoretical views that stipulate emotions as natural kinds, even in the face of accumulating findings that do not support this assumption (i.e., instances of emotion category do not appear to be homologous or analogous; Barrett, 2006a; Cacioppo et al., 2000; Lindquist et al., 2012; Mauss & Robinson, 2009), we predicted that essentialist beliefs would influence participants’ self-characterization of their general degree of emotion differentiation on the RDEES but not the degree of emotional granularity derived from momentary experiences of emotion across a 1- to 2-week span.

## Method

**Participants.** Fifty-five undergraduate students (23 men, 32 women) from Northeastern University participated in this study for \$200. Participants were part of a larger experience-sampling study (Gendron & Barrett, 2013) examining how individual differences in concept knowledge about emotion influences emotional differentiation, which will not be discussed in this article. As part of this larger study, participants completed other measures that tested hypotheses not relevant to this article. Information about these other measures is available from the authors upon request.

### Measures.

**Essentialism questionnaire.** Participants each completed a computerized version of the essentialism questionnaire used in Study 1. The survey was administered via Survey Monkey software (1999–2011, <http://www.surveymonkey.com>). The majority of participants (40) completed the survey during the experience sampling procedure. The remainder (15) completed it before the experience-sampling period began. To ensure that the time at which the essentialism survey was completed did not moderate the relationship between essentialism and emotional differentiation, we conducted separate regressions in which survey completion time and essentialism scores were regressed on granularity scores and RDEES scores. The time at which the essentialism survey was completed did not change the nature of the relationship between

essentialism and RDEES scores or essentialism and granularity scores (see Results).

**Self-reported emotion differentiation.** Participants filled out a computerized version of the Range and Differentiation of Emotional Experience Questionnaire developed by Kang and Shaver (2004). This questionnaire has two subscales measuring the extent to which a person characterizes himself or herself as experiencing a range of different emotional experiences and the extent to which a person characterizes himself or herself as having differentiated experiences of emotion (e.g., to what extent do you draw distinctions between feelings?). Participants rated the extent to which they agreed with each of 14 statements using a 7-point Likert scale. Participants completed the RDEES online via Survey Monkey software (1999–2011, <http://www.surveymonkey.com>). The majority of participants (36) completed the survey during the experience sampling procedure. The remainder (19) completed it after the experience-sampling period was complete. To ensure that the time at which the RDEES survey was completed did not moderate the relationship between essentialism and RDEES scores, we conducted separate regressions in which survey completion time and essentialism scores were regressed on RDEES scores. The time at which the essentialism survey was completed did not change the nature of the relationship between essentialism and the RDEES (see Results).

**Experience-sampling procedure.** Participants completed a 1- or 2-week experience-sampling procedure using the Experience Sampling Program (ESP; Barrett & Barrett, 2001), an open source-software that was installed on palmtop computers (palmone zire31) using a protocol adapted from Barrett (2004, Study 3). Sampling occurred at random times between the hours of 8 a.m. and 11 p.m., with 10 measurement moments per day. At each sampling instance, participants were provided with 39 emotion adjectives (see Table 4) in a randomized order and rated on a scale of 1 to 5 the extent to which each adjective characterized their experience at that moment. Emotion adjectives were chosen to represent intense, moderate, and weak versions of emotional states adapted from the PANAS-X. Three additional terms (bored, restful, and relaxed) were included to ensure that all the quadrants of affective space (Barrett, 1998) were represented. Participants visited the lab for three sessions total, and experience sampling occurred either across a 2-week period (for 20 participants) or across a 1-week period (for 35 participants). To ensure that the length of experience sampling did not moderate the relationship between granularity and essentialism, we conducted separate regressions in which the length of experience sampling and essentialism scores were regressed on granularity scores. The length of experience sampling that participants underwent did not change the nature of the relationship between essentialism and granularity (see Results).

To ensure compliance, we required all participants to answer a minimum of 75% of the sampling instances to remain in the study. A 75% compliance threshold is comparable to what has been used in previous studies assessing granularity (e.g., Barrett, 2004; Tugade et al., 2004). Ratings of a given adjective with latencies less than 80 ms were also counted against overall compliance because they indicated that participants were responding too quickly to reflect actual ratings of their momentary experiences. All partici-

pants in this study completed 75% or more of the sampling instances and were, thus, deemed compliant with instructions.

#### Data analysis.

**Essentialism questionnaire.** Unit-weighted analogy and homology scores were calculated based on the components derived in Study 1 for both positive emotion ratings and negative emotion ratings. The result was four scores: negative-analogy, negative-homology, positive-analogy, and positive-homology. The scores in Study 3 were similar to ratings made for positive and negative emotions in Studies 1–2 (see Table 5).

**Self-reported emotion differentiation.** Per Kang and Shaver (2004), responses on four questions were first reverse scored. Odd numbered items were then averaged to create a “range of emotional experience” score and even numbered items were averaged to create a “differentiation of emotional experience” score for each participant.

**Experience-sampling procedure.** As in Tugade et al. (2004), we computed granularity as the intraclass correlations (ICCs) with absolute agreement for ratings of pairs of positive emotions (content, admiration, superior, joy euphoria, calm, serene, gratitude, appreciation, pride, successful, happiness, amusement, excitement, enthusiasm) and pairs of negative emotions (rage, anger, irritation, loathing, contempt, scorn, terror, fear, nervous, revulsion, disgust, distaste, misery, sadness, blue, remorse, guilt, sorry, bored) across measurement moments. It is important to note that the number of measurement moments included in the analysis did not affect the estimate of granularity itself ( $ps > .05$ ). The average measures ICC for positive emotions and average measures ICC for negative emotions were used as our granularity estimates of positive and negative emotions, respectively, for each participant across all instances of the experience-sampling procedure. For ease of interpretation, we report reverse-scored ICCs, such that a higher score indicates higher granularity.

On average, mean granularity for negative emotions was 0.69 ( $SD = 0.25$ ; range =  $-0.23$ – $0.95$ ). Mean granularity for positive emotions was 0.78 ( $SD = 0.12$ ; range =  $0.33$ – $0.94$ ). These findings are comparable to what has been observed in other studies assessing granularity (e.g., Barrett et al., 2001; Tugade et al., 2004). Like some previous studies (Barrett, 1998) but not others (Barrett et al., 2001), participants’ degree of granularity for negative emotions correlated with their degree of granularity for positive emotions ( $r = .487$ ,  $p < .001$ ) in our study. We have argued elsewhere that granularity is related to the complexity of the conceptual knowledge about emotion that participants bring to bear in a given context to make meaning of their affective states (Lindquist & Barrett, 2008b). Although it remains a question for future research, it is, thus, possible that we observed a correlation between positive granularity and negative granularity in our sam-

ple because participants who possessed sophisticated and differentiated (vs. unsophisticated and undifferentiated) knowledge about negative emotions also possessed sophisticated and differentiated (vs. unsophisticated and undifferentiated) conceptual knowledge about positive emotions.

## Results and Discussion

Consistent with findings that essentialism is associated with perceiving categories as highly differentiated from one another (see Prentice & Miller, 2007), we found that individuals who believed that instances of negative emotion categories have an essence (negative-homology) also characterized themselves as having highly differentiated emotions on the RDEES ( $r = .274$ ,  $p < .055$ ).<sup>6</sup> Although we had no a priori predictions about the relationship between the self-reported range of emotional experiences and essentialism, we found that participants who believed that instances of positive emotion categories share surface similarities (positive-analogy) also characterized themselves as having a greater range of emotion experiences on the RDEES ( $r = .299$ ,  $p < .035$ ).<sup>7</sup> These findings suggest that individuals who tend to see instances of joy, pride, and so forth as similar to other instances of the same category but different from instances of other categories also perceive themselves to experience a wider range of emotions that vary from instances of negative emotions (e.g., fear, disgust, anger) to instances of positive emotions (e.g., pride, joy, gratitude).

In line with our hypothesis that essentialism is a heuristic that does not necessarily accurately represent the nature of emotion as measured in momentary emotional experiences, individuals who essentialized emotions did not in fact have more granular experiences of emotion across a 1- to 2-week experience-sampling period. There was no relationship between negative-homology and negative granularity ( $r = .026$ ,  $p < .851$ ) or negative-analogy and negative granularity ( $r = .179$ ,  $p < .190$ ),<sup>8</sup> suggesting that beliefs about essentialism are not related to a tendency to experience emotions as highly differentiated in daily life. Although not predicted a priori, we found that people who essentialized positive emotions showed less positive granularity. Participants who believed that positive emotions have a deep, inherent essence (positive-homology) were more likely to experience positive emotions in an undifferentiated manner in daily life ( $r = -.301$ ,  $p <$

<sup>6</sup> The relationship between negative homology and RDEES differentiation was significant ( $\beta = .300$ ,  $p < .044$ ) even when controlling for when both the RDEES ( $\beta = .074$ ,  $p < .634$ ) and essentialism ( $\beta = -.012$ ,  $p < .938$ ) surveys were completed relative to the experience sampling procedure.

<sup>7</sup> The relationship between positive analogy and RDEES range remained significant ( $\beta = .291$ ,  $p < .047$ ) even when controlling for when both the RDEES ( $\beta = .092$ ,  $p < .552$ ) and essentialism ( $\beta = -.202$ ,  $p < .192$ ) surveys were completed relative to the experience sampling procedure.

<sup>8</sup> Neither the relationship between negative homology and negative granularity ( $\beta = .015$ ,  $p < .931$ ) nor negative analogy and negative granularity ( $\beta = .173$ ,  $p < .211$ ) became significant when controlling for the length of the experience sampling procedure. Similarly, neither the relationship between negative homology and negative granularity ( $\beta = .014$ ,  $p < .921$ ) nor negative analogy and negative granularity ( $\beta = .176$ ,  $p < .202$ ) became significant when controlling for when the essentialism survey was completed relative to the experience sampling procedure.

Table 5  
Negative and Positive Emotion Essentialism Means (SDs)

Study	Homology		Analogy	
	Negative	Positive	Negative	Positive
1	4.85 (0.90)	4.92 (0.92)	3.81 (0.73)	3.66 (0.75)
2	4.63 (0.77)	4.63 (0.72)	4.81 (0.69)	4.74 (0.66)
3	3.63 (0.65)	2.99 (0.76)	3.43 (0.76)	3.39 (0.69)

.026).<sup>9</sup> Positive-analogy was unrelated to positive granularity ( $r = .057, p > .679$ ).<sup>10</sup> Although it is important not to overinterpret unexpected findings, these data open the question of whether essentialism is somehow linked to less complexity in the positive emotional experiences that are known to be highly functional and to confer interpersonal benefits (Algoe, Gable, & Maisel, 2010; Algoe & Stanton, 2012; Condon & DeSteno, 2011; Williams & DeSteno, 2008). Whether individuals who essentialize positive emotions might be missing out on the benefits conferred from experiencing positive emotions in a highly differentiated manner is a question for future research.

### General Discussion

William James (1890) noted that psychologists mistakenly assume that emotions are entities arguing, “surely there is no definite affection of ‘anger’ in an ‘entitative’ sense” (p. 206). James believed that essentialist assumptions lead psychologists to search for the deep properties or essences that ground emotion categories. Of course, it might be difficult to avoid essentializing emotions—people who essentialize emotion are demonstrating a basic cognitive phenomenon: Essentialism is an implicit worldview that develops early in human cognition and applies to many types of categories (Gelman, 2009). For the first time, across three studies, we demonstrated that many (but not all) participants essentialized emotion categories by believing that emotions are natural kinds by homology. In Study 1, we found that people tend to imbue emotion categories such as anger or sadness with a biological essence that is thought to define or create the instances of each category (albeit this belief was weaker for emotion categories than for natural kind categories such as elephants or pine trees). In Study 2, we found evidence that categories whose instances are tied to the body (e.g., hunger) are more essentialized than are categories that are thought to exist in the mind (e.g., memory). On average, emotions fell in between body states and cognitions in ratings of homology, but this average obscured individual differences in essentialism. Over half of the participants believed that emotions, just like body states, have an essence that defines them. Taken together, our findings suggest that some people essentialize emotions specifically because they believe emotions have causal mechanisms in the body; in this way, our findings are consistent with evidence that people essentialize categories that are perceived to have a naturalistic cause (see Prentice & Miller, 2007). Indeed, many researchers who continue to define emotions as natural kinds by homology believe that instances of specific emotion categories issue from specific mechanisms in the body (e.g., Ekman & Cordano, 2011; Tomkins, 1963) or brain (e.g., Calder, 2003; Panksepp, 2004; Vytal & Hamann, 2010). Although there is no doubt that emotions emerge from mechanisms in the body or brain, there is doubt that there are specific mechanisms in the body (Barrett, 2006a; Cacioppo et al., 2000; Mauss & Robinson, 2009) or brain (Lindquist et al., 2012) for specific categories of emotion. Similarly, although changes in the body are always involved in emotion, representations of bodily states are also involved in other kinds of mental states (Oosterwijk et al., 2012).

In Study 3, we demonstrated that individuals who essentialized emotions characterized themselves as having highly differentiated experiences (when essentializing negative emotions) and a greater range of emotional experiences (when essentializing positive emo-

tions), yet these beliefs and self-characterizations did not translate into more granular emotional experiences in everyday life. Rather, individuals who essentialized positive emotions were less likely to experience distinct positive emotions in everyday life. If anything, these findings suggest that individuals who essentialize emotions might have less complex experiences of positive emotions.

### Implications and Future Directions

Taken together, our findings are useful as the context of discovery (Reichenbach, 1938)—they demonstrate the need for future research to investigate how essentialist beliefs about emotions develop in the first place, why some people essentialize emotions whereas others do not, and what benefits or risks such emotion essentialism confers. For instance, consistent with prior research (see Prentice & Miller, 2007), we found that inferring a naturalistic or biological cause for a category leads to essentialism. Future research might therefore investigate whether people who are more attuned to their body states during emotion (e.g., better at detecting their own heartbeats; Barrett, Quigley, Bliss-Moreau, & Aronson, 2004) are more likely to essentialize emotions.

It is also possible, however, that a belief in the biological basis of emotions is a consequence rather than a cause of essentialism. Research demonstrates that the very language we speak might cause people to reify and, thus, essentialize certain categories. People can essentialize a category even when they do not have a concrete representation of the category’s essence (Medin & Ortony, 1989), instead representing the essence as an abstract essence placeholder. Words seem to serve as essence placeholders when children are acquiring abstract category knowledge (see Gelman, 2009). Even adults appear to use words as essence placeholders when acquiring novel categories (Lupyan, Rakison, & McClelland, 2007). James (1890), Duffy (1941), and Hunt (1941) all observed that emotion words cause people to reify emotions—emotion categories might, thus, be essentialized merely because we have words for certain emotions. This idea is consistent with findings demonstrating the power of words during emotion perception (for reviews, see Barrett, Lindquist, & Gendron, 2007; Lindquist & Gendron, 2013) and emotion experience (e.g., Lindquist & Barrett, 2008a). Individuals who essentialize emotions might, thus, use emotion vocabulary in a less context-sensitive way or have more stereotyped emotion concepts (e.g., believe that all instances of anger involve aggression). There are also cultural differences in essentialism (Bloch, Solomon, & Carey, 2001), so it follows that cultural differences might exist in the essentialism of emotion.

Another interesting avenue of future research regards whether essentialist beliefs influence behavior and regulatory strategies

<sup>9</sup> The relationship between positive homology and positive granularity remained significant ( $\beta = -.301, p < .026$ ) when controlling for the length of the experience sampling procedure ( $\beta = -.082, p < .536$ ). Similarly, the relationship remained significant ( $\beta = -.283, p < .034$ ) when controlling for when the essentialism survey was completed relative to the experience sampling procedure ( $\beta = .183, p < .167$ ).

<sup>10</sup> The relationship between positive analogy and positive granularity ( $\beta = .041, p < .775$ ) did not become significant when controlling for the length of the experience sampling procedure. Nor did the relationship between positive analogy and positive granularity ( $\beta = .025, p < .854$ ) become significant when controlling for when the essentialism survey was completed relative to the experience sampling procedure.

during instances of emotion. Although no research to date has explicitly tested this hypothesis, the literature on entity theory (Dweck, 2000) in personality research is instructive. Entity theorists, who view personality traits as stable and given, experience different outcomes in self-regulation and social cognition than incremental theorists, who believe that personality is cultivated and changeable (Dweck, 2000). For instance, entity theorists are less likely than incremental theorists to engage in self-regulation in the face of stereotype threat, life transitions, and social threat (for a review, see Molden & Dweck, 2006). Entity theorists are also more likely than incremental theorists to engage in the fundamental attribution error because they prioritize dispositional attributions over situational attributions (Chiu, Hong, & Dweck, 1997). Together, these findings suggest that individuals who hold essentialist beliefs about emotion might have more difficulty regulating their actions or might have less of a goal to do so if they believe that emotions are biologically given reflexes that proceed in an inexorable way after they have been triggered. Such findings would have legal implications; essentialist beliefs about emotions are already embedded in the U.S. legal system, in which the “sudden heat of passion” constitutes an adequate provocation that reduces an act of intentional homicide to an offense of voluntary manslaughter (Dressler, 2001, p. 527).

Finally, our findings raise the question of whether essentialist beliefs have the potency to influence not only what individuals know about their own emotional experiences but also the questions that scientists ask about emotions. Recent research suggests that anger, disgust, fear, and so forth might be states that emerge from the combination of more basic psychological processes, some of which are present in nonhuman animals, all of which can be causally reduced to biology, but none that are specific to emotion. For example, there is emerging evidence that emotions are psychologically constructed from the combination of more basic bodily states, conceptual knowledge about emotion, and executive attention (e.g., Lindquist & Barrett, 2008a; Lindquist et al., 2012; Oosterwijk et al., 2012). Thus, while some researchers continue to stipulate that emotions are natural kind categories (e.g., Ekman & Cordaro, 2011; Izard, 2011; Levenson, 2011; Panksepp, 2004; Tracy et al., 2010), we and other researchers believe that there is ample research to suggest that emotion categories are nominal kinds (Barrett, 2006a, 2006b, 2012; Clore & Ortony, 2008; Cunningham & Kirkland, in press; Duffy, 1941; Hunt, 1941; Kirkland & Cunningham, 2012; Lindquist & Barrett, 2008b; Lindquist & Barrett, 2012; Lindquist et al., 2012; Oosterwijk et al., 2012; Russell, 2003; Wilson-Mendenhall et al., 2011). Understanding the ways in which essentialist beliefs have the power to actually shape the science of emotion is, thus, perhaps the most intriguing new question of all.

## References

- Algoe, S. B., Gable, S. L., & Maisel, N. (2010). It's the little things: Everyday gratitude as a booster shot for romantic relationships. *Personal Relationships, 17*, 217–233. doi:10.1111/j.1475-6811.2010.01273.x
- Algoe, S. B., & Stanton, A. L. (2012). Gratitude when it is needed most: Social functions of gratitude in women with metastatic breast cancer. *Emotion, 12*, 163–168. doi:10.1037/a0024024
- Aristotle, C., & Bostock, D. (1994). *Aristotle metaphysics*: Gloucestershire, UK: Clarendon Press.
- Barrett, L. F. (1998). Discrete emotions or dimensions? The role of valence focus and arousal focus. *Cognition & Emotion, 12*, 579–599. doi:10.1080/026999398379574
- Barrett, L. F. (2004). Feelings or words? Understanding the content in self-report ratings of experienced emotion. *Journal of Personality and Social Psychology, 87*, 266–281. doi:10.1037/0022-3514.87.2.266
- Barrett, L. F. (2006a). Are emotions natural kinds? *Perspectives on Psychological Science, 1*, 28–58. doi:10.1111/j.1745-6916.2006.00003.x
- Barrett, L. F. (2006b). Solving the emotion paradox: Categorization and the experience of emotion. *Personality and Social Psychology Review, 10*, 20–46. doi:10.1207/s15327957pspr1001\_2
- Barrett, L. F. (2009). Variety is the spice of life: A psychological construction approach to understanding variability in emotion. *Cognition & Emotion, 23*, 1284–1306. doi:10.1080/02699930902985894
- Barrett, L. F. (2012). Emotions are real. *Emotion, 12*, 413–429. doi:10.1037/a0027555
- Barrett, L. F., & Barrett, D. J. (2001). Computerized experience-sampling: How technology facilitates the study of conscious experience. *Social Science Computer Review, 19*, 175–185. doi:10.1177/089443930101900204
- Barrett, L. F., Gross, J. J., Christensen, T. C., & Benvenuto, M. (2001). Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and regulation. *Cognition & Emotion, 15*, 713–724. doi:10.1080/02699930143000239
- Barrett, L. F., Lindquist, K. A., & Gendron, M. (2007). Language as context for the perception of emotion. *Trends in Cognitive Sciences, 11*, 327–332. doi:10.1016/j.tics.2007.06.003
- Barrett, L. F., Quigley, K., Bliss-Moreau, E., & Aronson, K. R. (2004). Arousal focus and interoceptive sensitivity. *Journal of Personality and Social Psychology, 87*, 684–697. doi:10.1037/0022-3514.87.5.684
- Bloch, M., Solomon, G. E. A., & Carey, S. (2001). Zafimaniry: An understanding of what is passed on from parents to children: A cross-cultural investigation. *Journal of Cognition and Culture, 1*, 43–68. doi:10.1163/156853701300063570
- Bloom, P. (2004). *Descartes's baby*. New York: Basic Books.
- Buck, R. (1999). The biological affects: A typology. *Psychological Review, 106*, 301–336. doi:10.1037/0033-295X.106.2.301
- Cacioppo, J. T., Berntson, C. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In M. Lewis & J. M. H. Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 173–191). New York, NY: Guilford Press.
- Calder, A. J. (2003). Disgust discussed. *Annals of Neurology, 53*, 427–428. doi:10.1002/ana.10565
- Chiu, C., Hong, Y., & Dweck, C. S. (1997). Lay dispositionism and implicit theories of personality. *Journal of Personality and Social Psychology, 73*, 19–30. doi:10.1037/0022-3514.73.1.19
- Clore, G. L., & Ortony, A. (2008). Appraisal theories: How cognition shapes affect into emotion. In J. M. Haviland-Jones, M. Lewis, & L. F. Barrett (Eds.), *Handbook of emotions* (Vol. 3, pp. 628–642). New York, NY: Guilford Press.
- Condon, P., & DeSteno, D. (2011). Compassion for one reduces punishment for another. *Journal of Experimental Social Psychology, 47*, 698–701. doi:10.1016/j.jesp.2010.11.016
- Cunningham, W. A., & Kirkland, T. (in press). Emotion, cognition, and the classical elements of mind. *Emotion Review*.
- Demirlap, E., Thompson, R., Mata, J., Barrett, L. F., Ellsworth, P. C., Demirlap, M., . . . Jonides, J. (2012). Feeling blue or turquoise? Emotional differentiation in major depression. *Psychological Science, 23*, 1410–1416. doi:10.1177/0956797612444903
- Dolan, R. J. (2002, November 8). Emotion, cognition, and behavior. *Science, 298*, 1191–1194. doi:10.1126/science.1076358
- Dressler, J. (2001). *Understanding criminal law* (3rd ed.). New York, NY: Matthew Bender.

- Duffy, E. (1941). An explanation of "emotional" phenomena without the use of the concept "emotion". *Journal of General Psychology*, 25, 283–293. doi:10.1080/00221309.1941.10544400
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. New York, NY: Psychology Press.
- Einstein, A., & Infeld, L. (1983). *The evolution of physics*. Cambridge, UK: Cambridge University Press.
- Ekman, P. (1999). Basic emotions. In T. Dalgleish & T. Power (Eds.), *The handbook of cognition and emotion* (pp. 45–60). Sussex, UK: Wiley.
- Ekman, P., & Cordaro, D. (2011). What is meant by calling emotions basic. *Emotion Review*, 3, 364–370. doi:10.1177/1754073911410740
- Ekman, P., Friesen, W. V., O'Sullivan, M., Chan, A., Diacoyanni-Tarlatzis, I., Heider, K., . . . Athanase, T. (1987). Universals and cultural differences in the judgments of facial expressions of emotion. *Journal of Personality and Social Psychology*, 53, 712–717. doi:10.1037/0022-3514.53.4.712
- Ellsworth, P. C., & Scherer, K. R. (2003). Appraisal processes in emotion. In R. J. Davidson, K. R. Scherer, & H. H. Goldsmith (Eds.), *Handbook of affective sciences* (pp. 572–595). New York, NY: Oxford University Press.
- Gelman, S. A. (2009). Learning from others: Children's construction of concepts. *Annual Review of Psychology*, 60, 115–140. doi:10.1146/annurev.psych.59.103006.093659
- Gelman, S. A., & Taylor, M. A. (2000). Gender essentialism in cognitive development. In P. H. Miller & E. Kofsky Scholnick (Eds.), *Towards a feminist developmental psychology* (pp. 169–190). Florence, KY: Taylor & Francis.
- Gendron, M., & Barrett, L. F. (2009). Reconstructing the past: A century of ideas about emotion in psychology. *Emotion Review*, 1, 316–339. doi:10.1177/1754073909338877
- Gendron, M., & Barrett, L. F. (2013). *Essentialism of emotion and emotional complexity*. Manuscript in preparation.
- Goodman, N. (1983). *Fact, fiction, and forecast*. Cambridge, MA: Harvard University Press.
- Gray, H. M., Gray, K., & Wegner, D. M. (2007, February 2). Dimensions of mind perception. *Science*, 315, 619. doi:10.1126/science.1134475
- Gray, K., & Wegner, D. M. (2009). Moral typecasting: Divergent perceptions of moral agents and moral patients. *Journal of Personality and Social Psychology*, 96, 505–520. doi:10.1037/a0013748
- Haslam, N., & Ernst, D. (2002). Essentialist beliefs about mental disorders. *Journal of Social and Clinical Psychology*, 21, 628–644.
- Haslam, N., & Levy, S. R. (2006). Essentialist beliefs about homosexuality: Structure and implications for prejudice. *Personality and Social Psychology Bulletin*, 32, 471–485. doi:10.1177/0146167205276516
- Haslam, N., Rothschild, L., & Ernst, D. (2000). Essentialist beliefs about social categories. *British Journal of Social Psychology*, 39, 113–127. doi:10.1348/014466600164363
- Hunt, W. A. (1941). Recent developments in the field of emotion. *Psychological Bulletin*, 38, 249–276. doi:10.1037/h0054615
- Izard, C. E. (2011). Forms and functions of emotions: Matters of emotion-cognition interactions. *Emotion Review*, 3, 371–378. doi:10.1177/1754073911410737
- James, W. (1890). *Principles of psychology*. New York: Holt.
- Kang, S. M., & Shaver, P. R. (2004). Individual differences in emotional complexity: Their psychological implications. *Journal of Personality*, 72, 687–726. doi:10.1111/j.0022-3506.2004.00277.x
- Kirkland, T., & Cunningham, W. A. (2012). Mapping emotions through time: How affective trajectories inform the language of emotion. *Emotion*, 12, 268–282. doi:10.1037/a0024218
- Levenson, R. L. (2011). Basic emotion questions. *Emotion Review*, 3, 379–386. doi:10.1177/1754073911410743
- Lindquist, K. A., & Barrett, L. F. (2008a). Constructing emotion: The experience of fear as a conceptual act. *Psychological Science*, 19, 898–903. doi:10.1111/j.1467-9280.2008.02174.x
- Lindquist, K. A., & Barrett, L. F. (2008b). Emotional complexity. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 513–530). New York, NY: Guilford Press.
- Lindquist, K. A., & Barrett, L. F. (2012). A functional architecture of the human brain: Insights from emotion. *Trends in Cognitive Sciences*, 16, 533–540. doi:10.1016/j.tics.2012.09.005
- Lindquist, K. A., & Gendron, M. (2013). What's in a word: Language constructs emotion perception. *Emotion Review*, 5, 66–71. doi:10.1177/1754073912451351
- Lindquist, K. A., Wager, T. D., Kober, H., Bliss-Moreau, E., & Barrett, L. F. (2012). The brain basis of emotion: A meta-analytic review. *Behavioral and Brain Sciences*, 35, 121–143. doi:10.1017/S0140525X11000446
- Lupyan, G., Rakison, D. H., & McClelland, J. L. (2007). Language is not just for talking. *Psychological Science*, 18, 1077–1083. doi:10.1111/j.1467-9280.2007.02028.x
- MacLean, P. D. (1949). Psychosomatic disease and the visceral brain: Recent developments bearing on the Papez theory of emotion. *Psychosomatic Medicine*, 11, 338–353.
- Matsumoto, D. (1990). Cultural similarities and differences in display rules. *Motivation and Emotion*, 14, 195–214. doi:10.1007/BF00995569
- Mauß, I. B., & Robinson, M. D. (2009). Measures of emotion: A review. *Cognition & Emotion*, 23, 209–237. doi:10.1080/02699930802204677
- McGarty, C., Haslam, S. A., Hutchinson, K. J., & Grace, D. M. (1995). Determinants of perceived consistency: The relationship between group entitativity and the meaningfulness of categories. *British Journal of Social Psychology*, 34, 237–256. doi:10.1111/j.2044-8309.1995.tb01061.x
- Medin, D. L., & Ortony, A. (1989). Psychological essentialism. In S. Vosniadou & A. Ortony (Eds.), *Similarity and analogical reasoning* (pp. 179–195). Cambridge, England: Cambridge University Press.
- Molden, D. C., & Dweck, C. S. (2006). Finding "meaning" in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, 61, 192–203. doi:10.1037/0003-066X.61.3.192
- Oosterwijk, S., Lindquist, K. A., Anderson, E. C., Dautoff, R., Moriguchi, Y., & Barrett, L. F. (2012). States of mind: Emotions, body feelings, and thoughts share distributed neural networks. *NeuroImage*, 62, 2110–2128. doi:10.1016/j.neuroimage.2012.05.079
- Ortony, A., & Turner, T. J. (1990). What's basic about basic emotions? *Psychological Review*, 97, 315–331.
- Panksepp, J. (2004). *Affective neuroscience: The foundations of human and animal emotions*. New York, NY: Oxford University Press.
- Panksepp, J., & Watt, D. (2011). What is basic about basic emotions? Lasting lessons from affective neuroscience. *Emotion Review*, 3, 387–396. doi:10.1177/1754073911410741
- Papez, J. W. (1937). A proposed mechanism of emotion. *Archives of Neurology & Psychiatry*, 38, 725–743. doi:10.1001/archneurpsyc.1937.02260220069003
- Prentice, D. A., & Miller, D. T. (2007). Psychological essentialism of human categories. *Current Directions in Psychological Science*, 16, 202–206.
- Reichenbach, H. (1938). *Experience and prediction: An analysis of the foundations and structure of scientific knowledge*. Chicago, IL: University of Chicago Press.
- Robinson, M. D., & Barrett, L. F. (2010). Belief and feeling in self-reports of emotion: Assessing semantic infusion effects. *Self and Identity*, 9, 87–111. doi:10.1080/15298860902728274
- Robinson, M. D., & Clore, G. L. (2002). Episodic and semantic knowledge in emotional self-report: Evidence for two judgment processes. *Journal of Personality and Social Psychology*, 83, 198–215. doi:10.1037/0022-3514.83.1.198
- Rosch, E. H. (1973). On the internal structure of perceptual and semantic

- categories. In T. E. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 111–144). London, England: Academic Press.
- Rothbart, M., & Taylor, M. (1992). Category labels and social reality: Do we view social categories as natural kinds? In G. Semin & K. Fiedler (Eds.), *Language, interaction and social cognition* (pp. 11–36). London, England: Sage.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, *110*, 145–172.
- Tomkins, S. S. (1963). *Affect, imagery, consciousness: The negative affects* (Vol. 2). New York, NY: Springer.
- Tracy, J. L., & Robbins, R. W. (2007). The self in self-conscious emotions: A cognitive appraisal approach. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research* (pp. 3–20). New York, NY: Guilford Press.
- Tracy, J. L., Shariff, A. F., & Cheng, J. T. (2010). A naturalist's view of pride. *Emotion Review*, *2*, 163–177. doi:10.1177/1754073909354627
- Tugade, M. M., Fredrickson, B. L., & Barrett, L. F. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality*, *72*, 1161–1190. doi:10.1111/j.1467-6494.2004.00294.x
- Vytal, K., & Hamann, S. (2010). Neuroimaging support for discrete neural correlates of basic emotions: A voxel-based meta-analysis. *Journal of Cognitive Neuroscience*, *22*, 2864–2885. doi:10.1162/jocn.2009.21366
- Williams, L. A., & DeSteno, D. (2008). Pride and perseverance: The motivational role of pride. *Journal of Personality and Social Psychology*, *94*, 1007–1017. doi:10.1037/0022-3514.94.6.1007
- Wilson-Mendenhall, C. D., Barrett, L. F., & Barsalou, L. (in press). Neural evidence that human emotions share core affective properties. *Psychological Science*.
- Wilson-Mendenhall, C. D., Barrett, L. F., Simmons, W. K., & Barsalou, L. (2011). Grounding emotion in situated conceptualization. *Neuropsychologia*, *49*, 1105–1127. doi:10.1016/j.neuropsychologia.2010.12.032
- Yzerbyt, V., Rocher, S., & Schadronek, G. (1997). Stereotypes as explanations: A subjective essentialistic view of group perception. In R. Spears, P. Oakes, N. Ellemers, & S. A. Haslam (Eds.), *The social psychology of stereotyping and group life* (pp. 20–50). Malden, MA: Blackwell Publishing.

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