

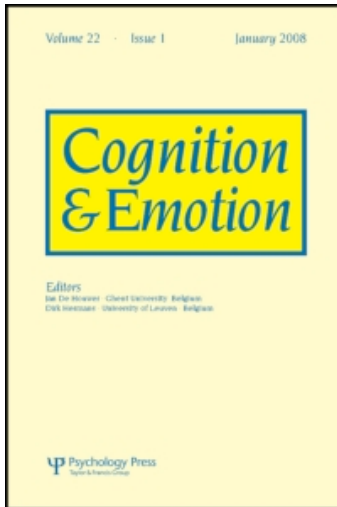
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Variety is the spice of life: A psychological construction approach to understanding variability in emotion

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There is remarkable variety in emotional life. Not all mental states referred to by the same word (e.g., “fear”) look alike, feel alike, or have the same neurophysiological signature. Variability has been observed within individuals over time, across individuals from the same culture, and of course across cultures. In this paper, I outline an approach to understanding the richness and diversity of emotional life. This model, called the *conceptual act model*, is not only well suited to explaining individual differences in the frequency and quality of emotion, but it also suggests the counter-intuitive view that the variety in emotional life extends past the boundaries of events that are conventionally called “emotion” to other classes of psychological events that people call by different names, such as “cognitions”. As a result, the conceptual act model is a unifying account of the broad variety of mental states that constitute the human mind.

Keywords: Affect; Categorization; Construction; Perception.

Variety is the spice of life. This idiom captures one of the great truths about human existence: There is tremendous richness and diversity in the mental states that people experience within themselves and perceive in others. Nowhere is this variability more apparent than in the experience and perception of emotion. Variability exists across cultures, across individuals within the same culture, and within an individual across instances.

Cultural variation in emotion categories takes various forms. Some emotion categories exist only in specific cultures. For example, “ligit” is the experience of intense, euphoric aggression that occurs during head hunting

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in the Ilongot tribe from the Philippines (Rosaldo, 1980). Some emotion categories appear to be universal, but their content and relational themes vary across cultures. For example, the experience of “sadness” is more akin to physical agony in Russian but the experience of loss in the USA (Wierzbicka, 2009); anger involves psychological distance from others in the USA but increasing proximity and closeness in Japan (Mesquita et al., 2006). The same mental content can exist across cultures but be differentially configured as emotion categories. For example, in the USA, sadness and anger are experienced as separate and distinct emotions, where sadness is the experience of loss and anger is the experience of violation or obstruction; whereas in Turkey sadness and anger are properties of a single emotion category called “kizginlik” (Mesquita, 1993).

Even within a culture, different people do not necessarily understand or experience emotion in exactly the same way. For example, in Canada and the USA, some people feel the heat of anger, the despair of sadness, the dread of fear, whereas others (who use the same words for emotion) instead experience amorphous feelings that are generally pleasant or unpleasant with little specificity (Barrett, 1998, 2004; Feldman, 1995). Emotional experts use emotion words to refer to very a wide variety of nuanced, precise, and distinct experiences, whereas those with less expertise use the words “anger”, “sadness”, and “fear” interchangeably, as if they did not experience these states as different from one another. They feel, for lack of a better word, “bad”. At the extreme, these individuals are alexithymic. (In the USA, alexithymia places individuals at risk for other medical and psychiatric disorders; in an Asian context where the boundary between mental and physical is not as reified, it is normal to experience emotions as physical symptoms).

Most interestingly, at least for the purposes of this paper, is the repeated observation that not all mental states belonging to a particular category named by an emotion word such as “fear” look alike, feel alike, or have the same neurophysiological signature from one instance to another. This observation was made repeatedly in the emotion literature between the late 1800s until mid century in the 1900s (for recent empirical reviews, see Ortony & Turner, 1990; Barrett, 2006a; Barrett et al., 2007a; Russell, 2003). For example, when another driver cuts you up in traffic, you might shout as you slam on the breaks. When your child picks up a sharp knife, you might calmly take it from her or ask her to put it down. When you hear a news report about a bombing or a hurricane, you might turn up the radio. When a colleague criticises you in front of a group, you might sit very still and perhaps even nod your head and smile. You may tease a friend who threatens your view of yourself, and so on. During these instances, your blood pressure might go up, or down, or stay the same. Sometimes you will feel your heart beating in your chest, and other times you will not. Your hands might

become clammy, or they might remain dry. Sometimes your eyes will widen but other times your brow will furrow, or you may even smile.

William James, of course, wrote eloquently about the variety in emotional life. For example, in *What Is An Emotion?* (1884), James argued for an infinite number of emotions, limited only by the number of physical states that the body could configure into. He wrote, "But not even a Darwin has exhaustively enumerated all the bodily affections characteristic of any one of the standard emotions. More and more, as physiology advances, we begin to discern how almost infinitely numerous and subtle they must be" (p. 191). James echoed this same point in *The Principles of Psychology* (1890), where he wrote "there is no limit to the number of possible different emotions which may exist, and why the emotions of different individuals may vary indefinitely, both as to their constitution and as to objects which call them forth. For there is nothing sacramental or eternally fixed in reflex action. Any sort of reflex effect is possible, and reflexes actually vary indefinitely, as we know". (p. 454). And in *The Physical Basis of Emotion* (1894/1994), James discussed the idea that emotions are not entities, so that two instances of emotion can look and feel very different from one another, even when they are called by the same name (and therefore placed in the same category). He wrote "'Fear' of getting wet is not the same fear as fear of a bear" and "we remain in such real ignorance as to what the subjective variation of our emotions actually are" (p. 206).

According to James, emotion words like "fear" and "anger" mask the reality of emotional life: For every pattern of bodily sensation, there is a corresponding distinct feeling state and therefore a distinct emotion. By the term "emotion", James was referring here to particular instances of feeling (what a cognitive psychologists would call an "exemplar" or "token"), not to discrete emotion categories. Different instances of an emotion, even those within the same category and named by the same word will feel different if the somatovisceral state is different. James explicitly rejected the idea of a single set of bodily symptoms to describe instances of a given emotion category across individuals. James wrote "Surely there is no definite affection of 'anger' in an 'entitative' sense". (1894/1994, p. 206).

Humans are not the only mammals to show great variety in emotional responding. Even rats do not behave in the exactly the same way in every instance that humans name with the same emotion word. For example, rats do many things in "fear" (i.e., in the presence a threat such as a predator). Rats freeze (do not move except for respiration) when exposed to an uncertain threat in a confined, vacant space, such as a 9×12 bare testing chamber (e.g., LeDoux, Cicchetti, Zagoraris, & Romanski, 1990). Rats avoid the location of uncertain threat when they are free to move, such as in a testing chamber with several arms (e.g., Vazdarjanova & McGaugh, 1998). When the source of threat is known, rats engage in the species typical action

of defensive treading (i.e., they kick up their bedding in the direction of the threat; Reynolds & Berridge, 2002, 2003, 2008). Similarly, rats show a classic “threat response” (i.e., increased blood pressure) when they are restrained, but show more of a challenge response (i.e., blood pressure decrease), when they are free to move and escape is possible (Iwata & LeDoux, 1988).

Even electrical stimulation of the exact same brain site does not produce the same emotion in a reliable and consistent fashion (see Barrett et al., 2007a, for a review). In a summary of this research, renowned neuroscientist Elliot Valenstein (1973) wrote: “It is not realistic to conceive of all nerve cells responding without variation to the same stimulus and being arranged without variation to convey impulses in a fixed direction and sequence” (p. 112). Study after study demonstrates that the behaviours and experiences elicited from electrical stimulation are strongly influenced by the context in which the stimulation took place and the pre-existing temperament of the stimulated animal. Valenstein concluded, “If studies with relatively homogenous, inbred animals suggested that there is a great amount of uncontrolled variability in the behavior produced by brain stimulation, we should expect an even greater source of unpredictability in the case of primates and especially humans” (p. 92).¹

With all of this variation, it is remarkable that most people (barring organic impairment) have little difficulty distinguishing instances of emotion categories named by the words “anger” and “sadness” and “fear” (Barrett, Lindquist, & Gendron, 2007b).² In fact, people easily and without effort refer to wildly different responses with the same name. Shouting, slamming on the breaks, explaining, attending to a newscast, smiling, teasing, freezing, withdrawing, and defensively treading have all been categorised as “fear”, so that the category, like all emotion categories, includes a variety of different body and brain states. And while there may be some statistical regularity across instances that people name using the same emotion word (although these have yet to be convincingly measured in a scientific sense over and above simple affective properties like valence; cf. Barrett, 2006c; Barrett

¹ Valenstein’s observation might seem surprising at first, but it is consistent with emerging neuroscience evidence that neurons do not code for a single property in a functionally specific way. For example, a recent study with rats demonstrates that there is a functional re-mapping of cells in the nucleus accumbens (part of the ventral striatum)—sometimes they code for reward and other times for threat, depending on the degree of negativity in the context (Reynolds & Berridge, 2008). The information signalled by a neuron also depends, in part, on the assembly of neurons that serve as the context in which it is firing, so that individual neurons respond to different type of sensory cues when participating in different neural assemblies, even in primary sensory areas where receptive fields for neurons are supposed to be well defined (as in primary visual cortex or V1; Basole, White, Fitzpatrick, 2003).

² People may not agree with one another as much as is assumed (Russell, 1994), and some people clearly have more trouble than do others (Barrett, 1998, 2004; Feldman, 1995).

et al., 2007a), the differences within a category outweigh the similarities. Said differently: The variability across different emotion categories is not substantially larger than the variability within any single category.

PERSPECTIVES ON EMOTIONAL VARIABILITY

Different theoretical approaches deal with the variety of emotional life in different ways. In the approach where emotions are equated with some kind of inborn instinct (termed “basic emotion approaches”; e.g., Allport, 1924; Ekman, 1972; Izard, 1971; MacDougall, 1908/1921; Panksepp, 1998), the assumption is that observed variability in emotional responding is the result of epiphenomenal social factors, like display rules or other regulation processes that mask or inhibit pre-potent, stereotyped responses. Often, these models explain the variability away as error or failure of experimental design.

Appraisal approaches to emotion, where emotions are responses that arise from a meaning analysis of a situation, seem designed to account for emotional variability (e.g., Smith & Ellsworth, 1985; Frijda, 1986; Scherer, this issue). The focus on variability in emotion, particularly in what might be called this “input” side of the emotion equation, can be seen in the earliest works written from an appraisal point of view. For example, David Irons (1894, 1897a, 1897b), in critiquing James’s notion of instinct, pointed out that not everyone responds to the same stimulus with the same emotion that manifests in the exact same way. Instead, Irons argued that the analysis of meaning makes a response the kind of emotion it is. When dealing with what might be called the “output” side of the emotion equation, Irons observed that the physical changes for a given emotion category (e.g., fear) are highly variable from one instance to the next, even though people experience the same kind of emotion each time. According to Irons, this constancy in category amidst great variability in physical state was evidence that all instances belonging to the same emotion category must contain a common “psychical” ingredient—the meaning analysis of the object.

In principle, modern appraisal models assume that the variability in emotional responses is limited only by the sheer variety of possible meaning combinations. In practice, however, most appraisal models have focused their attention on trying to identify the singular pattern (of cognitive evaluations, action tendencies, relational themes, co-ordinated outputs, etc.) for each presumed “basic” emotion category like anger, sadness, fear, and so on (with a few notable exceptions, e.g., Kuppens & Van Mechelen, 2007; Kuppens, Van Mechelen, & Meulders, 2004; Kuppens, Van Mechelen, Smits, De Boeck, & Ceulemans, 2007). This focus was largely inspired by Arnold (1960), who believed that appraisals, as cognitive mechanisms, trigger

“basic” emotions. She wrote, “For each emotion, there is a distinct pattern that remains more or less constant and is recognized as characteristic for that emotion”. And, “Whether we are afraid of a bear, a snake, or a thunderstorm, our bodily sensations during these experiences are very much alike. . . . there will always be a core that is similar from person to person and even from man to animal” (Arnold, 1960, p. 179). Appraisals were imbued with the power to diagnose objects or situations as personally relevant, and were given responsibility for triggering biological programmes that pre-exist within the individual.

The social constructionist approach to emotion, where emotions are responses that are formed by interactions with surrounding people, also accounts for variability in emotion, particularly at the cultural level. In the strong version of social constructionism, emotions are mental events that are performances of culture. As social artifacts, no emotion category is assumed to be biologically basic and the categories are thought to vary with the particular themes and needs of particular groups of people. Social constructionist views grew out of functionalist accounts of emotion (e.g., Dewey, 1894, 1895; Mead, 1895), and bear some resemblance to early behaviourist models where emotion words were thought to refer to eliciting conditions rather than to some underlying pattern of behaviour and physiology that never varies from instance to instance within a category (e.g., Dashiell, 1928; Dunlap, 1932; Klineberg, 1940; Landis, 1924; Meyer, 1933; Sherman, 1927). As a result of their historical foundations, social constructionist models of emotion tend not consider how variability might arise from the processes within the mind of any particular individual.

A final approach to understanding the variety in emotional life is found in psychological constructionist approaches to emotion. Psychological constructionist models are united in the assumption that the psychological events called “anger”, “sadness”, and “fear” are not basic, elemental building blocks or “atoms” of emotion, but instead are mental events that result from the interplay of more basic psychological ingredients that are themselves the result of evolution. William James proposed one of the first psychological constructionist approaches to emotion. In *The Principles of Psychology*, James wrote:

The trouble with the emotions in psychology is that they are regarded too much as absolutely individual things. So long as they are set down as so many eternal and sacred psychic entities, like the old immutable species in natural history, so long all that can be done with them is reverently to catalogue their separate characters, points, and effects. But if we regard them as products of more general causes (as “species” are now regarded as products of heredity and variation), the mere distinguishing and cataloguing becomes of subsidiary importance. Having the goose which lays the golden eggs, the description of each egg already laid is a minor matter (James, 1890, p. 449).

This quote illustrates two related principles grounding a psychological constructionist point of view. First, emotions are states of mind that are assembled from more basic, general causes. These causes can be combined in a myriad of ways to produce a myriad of outcomes that neither look nor feel the same even when named by the same word. Second, because they are highly variable mental states, emotion categories are not psychic entities. People group very different instances together into the same category and give them the same name. According to James, it is a fallacy to think that emotions are entities just because we can overlook the variability to categorise so easily. James considered this categorisation a nuisance factor when understanding the true nature of emotion. In fact, James makes clear a key implication of the constructionist approach to emotion: psychology must develop from a science that classifies emotional states into a science that explains their existence.

Like the basic emotion approach, psychological constructionist models take evolution seriously and consider how biological and species-general factors have some role in the events that are conventionally named as “sadness”, “anger”, and “fear”. Like the appraisal approach, the psychological construction approach to emotion involves making meaning out of sensory cues. And, like social constructionist models of emotion, psychological construction approaches consider the specific-specific elements of emotion. As socially constituted artifacts of learning and culture, no emotion category is assumed to be biologically basic. Most notably, and perhaps more than any other approach to understanding emotion, psychological constructionist models predict variability in emotional life and assume that this diversity must be a central feature in any explanation of what emotions are and how they work.

During the late nineteenth century (Spencer, 1855; Sully, 1892; Wundt, 1897) and mid-twentieth century (Brenner, 1974; Duffy, 1934, 1941; Dunlap, 1932; Harlow & Stagner, 1932, 1933; Hunt, 1941; Mandler, 1975; Ruckmick, 1936; Schachter, 1959), many psychological constructionist models of emotion were proposed, all of them inspired by the observation of variability in emotional responding and the failure of basic emotion approaches to account for this variability. In addition, most emphasise the processes by which internal sensory or affective states become meaningful—an emotion emerges when a person’s internal state is understood in some way as related to or caused by the external surroundings. This meaning analysis might be instinctual (e.g., James, 1884, James, 1890) or the result of some other process (e.g., Barrett, 2006b; Russell, 2003; Wundt, 1897), but it is largely assumed to proceed automatically with very little effort. (In the appraisal approach, in contrast, it is the situation, not the internal state of the body, that is the target of the meaning analysis; internal state changes are assumed to result from this meaning analysis in a way that reflects it.)

Because psychological constructionist models attempt to understand emotion as the meaning of internal bodily sensations or its corresponding mental feeling (affect), some critics mistakenly refer to these models as “peripheralist” (e.g., Scherer, 2009 this issue) or dimensional (e.g., Cumbetti, in press; Panksepp, 2007). No psychological constructionist models propose, however, that emotions can be ontologically reduced to only pleasant and unpleasant states or that affect alone provides a sufficient explanation for emotion. Most psychological constructionist models also posit a second, more cognitive or ideational ingredient. In some models, these ingredients combine in stages (e.g., Russell, 2003; Schachter & Singer, 1962; Wundt, 1897/1998), leading other critics to mistakenly refer to these models as “deliberate” or “cognitive” or “attributional” (e.g., Panksepp, 2007). Yet psychological constructionist models do not reify cognition and emotion as separate processes, and most do not assume that meaning making is deliberate, intentional, or “attributional”. As we will see, in at least one psychological constructionist approach to emotion, the psychological ingredients of emotion combine and constrain one another like ingredients in a recipe to produce a variety of emergent states (e.g., Barrett, 2006b; Barrett, Ochsner, & Gross, 2007d), consistent with the now widely accepted view that emotions are emergent mental phenomena (Clore & Ortony, 2008; Frijda, 2006).

THE CONCEPTUAL ACT MODEL

Over a series of papers published within the last several years, my lab has introduced a new psychological constructionist approach to emotion, called the conceptual act model (Barrett, 2005, 2006b, 2006c, in press; Barrett & Bar, 2009; Barrett & Bliss-Moreau, 2009; Barrett & Lindquist, 2008; Barrett et al., 2007a; Barrett, Lindquist, & Gendron, 2007b; Barrett, Mesquita, Ochsner, & Gross, 2007c; Barrett et al., 2007d; Duncan & Barrett, 2007; Gendron & Barrett, in press; Lindquist & Barrett, 2008a, 2008b). Like other psychological constructionist models, the conceptual act model states that an emotion word, like “fear”, names a commonsense category that corresponds to a range of mental events. These events are hypothesised to emerge from the interaction of more basic psychological ingredients. Unlike other constructionist models, however, categorisation takes centre stage in this model.

Categorisation doesn’t happen in stages, because a physical or affective state is ambiguous, or because people consciously experience the need or motivation to conceptualise. It happens as a natural consequence of the way the brain works. Human brains categorise—continuously, effortlessly, relentlessly. Some of the categories used by the brain are grounded in statistical regularities in the world. From birth, the human brain captures

statistical regularities in sensorimotor patterns and stores them as internal representations. Words are then applied to these categories later in development. Other categories have no statistical regularities. For these categories, words act like the glue that holds a category together. Without words, these categories would not exist. According to the conceptual act model, emotion categories are an example of the latter type of category (cf. Barrett, in press). The brain then draws from its vast repository of stored representations in the blink of an eye, to associatively recombine what it has learned in the past. This allows the brain to continuously and unintentionally categorise what sensory stimulation means in the present, to make the present state meaningful. An act of categorisation is the brain's prediction of what sensory stimulation stands for (e.g., Bar, 2007). Via this process of categorisation, the human brain transforms only some sensory stimulation into information. Only some of the wavelengths of light striking our retinas are transformed into seen objects. Only some of the changes in air pressure registered in our ears are heard as words or music. Only some sensations from the body are transformed into emotion.

To categorise sensations is to render them intentional (referring to something in the world) and meaningful. It then becomes possible to make reasonable inferences about those sensations, to predict what to do with them, and allows us to communicate them to others in an effective and efficient manner. Categorising functions like a chisel, dividing up the sensory world into figure and ground, and allowing us to refer to things by name. It fashions the present by drawing on experiences from the past, constructing what the neuroscientist calls "the remembered present" (Edelman, 1987).

The conceptual act model is grounded in one simple observation: Every moment of waking life results from the combination of three sources of stimulation: Sensations made available by the world outside the skin (the exteroceptive sensory array of light and vibrations and chemicals and so on), sensations captured from within the body that holds the brain (somatovisceral stimulation, also called the interoceptive sensory array or the "internal milieu"), and prior experience that the brain makes available by the activation and inhibition (or re-activation and re-inhibition) of sensory neurons (a.k.a. memory). These three sources—sensations from the world, sensations from the body, and prior experience—are continually variable and form the basic three ingredients of all mental life. Different recipes (the combination and weighting of these three ingredients) produce the myriad of mental events that people give commonsense names to, like perception, cognition, and emotion. Any sources of stimulation form the context in which the others are made meaningful.

During emotional experience ("How do I feel?") and emotion perception ("Is the rat afraid?" "Is my friend angry?" "Is my dog sad?"),

representations of internal sensations from the body and external sensations from the world are made meaningful by categorising them. This categorisation uses emotion knowledge that has been learned via prior experience. Together, these three sources of information create the variety of mental states (that represent your own feelings of your experience of someone else's behaviour) named with emotion words. These conceptualised states are like mental tools that the human brain uses to modify and regulate the internal state of the body that holds it (either directly or by acting on the world in a particular way). So, when a person is feeling angry, for example, he or she has categorised sensations from the body and the world using conceptual knowledge of the category "anger". As a result, that person will experience a unpleasant, high arousal state as evidence that someone is offensive. In fear, he or she will experience the same state as evidence that the world is threatening. And, either way, the person will behave accordingly.

In the conceptual act model, then, the words "anger", "sadness", "fear" (or other words in other cultures) name observer-dependent psychological categories (whatever the concepts in your culture) that live in the head of the perceiver and are transmitted by learning (Barrett, 2006b, in press). This is not to say that emotions like anger exist *only* in the head of the perceiver. Rather, it is more correct to say that they cannot exist without a perceiver. I experience myself as afraid or I see your face as fearful or I experience the rat as afraid, but fear does not exist independent of someone's perception of it. Without a perceiver, there are only internal sensations and a stream of physical actions.

According to the conceptual act model, emotion categories exist because groups of people agreed (for phenomenological and social reasons) that this is a functional way to parse the on-going mental activity that is realised in the brain. The model is consistent with the observation that some of the categories are cross-culturally stable (because they function to address certain universal human concerns that stem from living in large, complex groups), whereas other categories are culture specific. The conceptual act model hypothesises that the category instances named with emotion words are real, but they derive their reality from the human mind (in the context of other human minds). Mental activity is chunked this way for reasons (that have to do with collective intentionality, communication, and even self-regulation), but not because these categories are biological reified. In this view, "anger" and "sadness" and "fear" make up the Western psychological and social reality, and they must be explained by the brute fact that the human brain works, but these words do not name mechanisms that are necessarily respected by the human

brain; nor are they categories that are required by how the human brain works. In the conceptual act model, brain states are observer-independent facts. The existence of mental states is also an observer-independent fact. Anger, sadness, fear, and so on, are not observer-independent events, however. They are categories that have been formed and named by the human mind to represent and explain the human mind. So, in the conceptual act model, emotions are perceptions. They are mental contents, not processes. They are not modules in the brain, but they do, of course, correspond to brain states.

Admittedly, these are fairly broad ideas. Nonetheless, these ideas can be distilled into four specific hypotheses that are currently being operationalised and tested in the lab. In the next section, these hypotheses are outlined in more detail, with specific reference to their relevance for understanding individual variation in emotional life. Because some of these hypotheses have been spelled out in other recent papers from our lab, I focus here on those that have not yet been discussed in any detail, or those that have particular relevance for understanding variation in emotion.

HYPOTHESIS 1: PSYCHOLOGICAL PRIMITIVES

The first and perhaps most important hypothesis that defines the conceptual act model is that the mental events that people refer to as “emotion” are constructed, in the blink of an eye, from three more ingredients that are psychologically primitive (cannot be reduced to anything else psychological), and that are always in play: (1) a mammalian system that represents physical states that are experienced as pleasant or unpleasant with some degree of arousal (called *core affect*; Barrett & Bliss-Moreau, 2009; Russell & Barrett, 1999);³ (2) a human *conceptual system for emotion* (i.e., what people “know” about emotion) that resides in memory (Barrett, 2006b) and that might exist in a more limited form in non-human great apes; and (3) *controlled attention* that is not necessarily deliberate or

³ Affect is not always experienced as your reaction to the world. At times, affect is experienced as a property of objects so that conscious percepts are intrinsically infused with affective content. This is why a drink tastes good or is unappetising (e.g., Winkielman, Berridge, & Wilbarger, 2005), why we experience some people as nice, and others as mean; why some foods tastes good but others are distasteful; and why some paintings are beautiful while others are ugly. It is under these circumstances when core affect is experienced as a property of the world that it is called “unconscious”. When core affect is foregrounded in consciousness it is experienced as your reaction to the world: you like or dislike a drink, a person, or a painting. Or foregrounded affect can be experienced as emotion.

intentional but that helps to negotiate which conceptual elements are activated and which are suppressed in a given instance of conceptualisation (see Barrett, Tugade, & Engle, 2004, for a discussion). The conceptual act model hypothesises individual (and perhaps even cultural) differences in each of these three ingredients. People can differ in their affective reactivity, in the size and complexity of their conceptual systems for emotion, and in the controlled attentional capacity that is available to them to build categories and manage the process of categorization. When combined, these psychological primitives produce a powerful and highly flexible system that can account for the full richness and range of experience that characterises human emotional life.

A key distinguishing feature of the conceptual act model is the hypothesis that the conceptual instances belonging to any single emotion category are highly variable. In this view, a person doesn't have one concept for fear, but instead has a collection that can be associatively recombined in any number of diverse and flexible ways. Following the work on situated conceptualisations (Barsalou, 1999, 2003), the conceptual knowledge that is called forth to categorise affect in a given instance is tailored to the immediate situation. Furthermore, emotion concepts, in this view, are not amodal (lists of beliefs or propositions), but are themselves embodied (e.g., Barsalou, 2008; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005), blurring the boundary between conception and perception. And the conceptualisation of core affect is not something that occurs after the fact, as in the common idea of interpreting or cognising a snapshot of affective change after it has taken place. Instead, an instance of a concept, to the extent that it is expressed as a brain state that includes activity in sensory and motor neurons (some of which may be representing affect), intrinsically shapes the mental event that emerges as an emotion. This suggests, of course, that any particular pattern of physiological or motor activity that is observed in a given instance of "fear" will take its character both from a person's core affective state and from whatever conceptual knowledge is brought to bear during the categorisation process at a given point in time.

According to the conceptual act model, the ability to categorise confers some adaptive advantage, and so is likely evolutionarily preserved, even if the specific categories are not. Many cultures share similar emotion concepts (basic in the Roschian sense) because these concepts are optimal tools for negotiating in the kind of social environment that humans typically occupy (living in large groups with complicated relational rules).

Another key aspect of the conceptual act model is that individual differences in the degree of controlled attention in play during conceptualisation will display variability in whether emotions appear modular or not.

A cognitive module is defined as a fast, domain-specific set of processes that have evolved to handle particular types of information. Modules are assumed to be encapsulated and impenetrable (activities and outputs cannot be influenced by other classes of information such as expectations or beliefs), reflexive (providing predetermined outputs in response to predetermined inputs), and unconscious (it is impossible to reflect upon the operations of a module). Low amounts of controlled attention can produce a kind of “functional modularity”, however, where a system appears modular, but only because of insufficient attention (rather than because of the architecture of the brain systems themselves; Just & Carpenter, 1992). Individuals who have limited controlled attentional resources, or who are in situations that require these attentional resources, might produce functionally modular conceptualisations of their affective state that results in less flexible and therefore less functionally effective emotional episodes (cf. Barrett et al., 2004).

Individual differences in controlled attention might also have additional implications for the variety within the conceptual system itself. People with more attentional control might be better able to incorporate new information into existing categories, leading to more a complex and nuanced conceptual system for emotion. They might be better able to use their emergent emotional state to regulate subsequent behaviour (which might be a primary function of emotional experience). And they might be better able to articulate and introspect about their emotions or the emotions of others (see Barrett et al., 2004, for discussions of these three points).

HYPOTHESIS 2: A BOOK OF RECIPES

The conceptual act model relies on the metaphor of recipe, not machine, to depict how psychological primitives combine to produce the psychological events that people refer to as “emotion”. In the conceptual act model, psychological primitives are not separate, interacting bits and pieces of the mind that have no causal relation to one another like the cogs and wheels of a machine. Instead, they are more like elements in a well-stocked pantry that can be used to make any number of different recipes (which make the mental states that people experience and give names to).⁴ And just as there are many different recipes for bread, or soup, or sauces, so too is there variety in the recipes that make up anger, sadness, fear, and what have you. In the

⁴ The metaphor of a recipe works for describing any emergent phenomenon, such as the interplay of genes and epigenetic factors that together produce observed phenotypic behaviours (Bateson, 1976).

conceptual act model, the products of the various recipes are not universal (although they are not infinitely variable or arbitrary).⁵

Nor are the recipes themselves universal. The recipe for an emotion will differ from instance to instance within a person (based on the context). And just as bread recipes can vary across cultures, so too can the recipes for emotion vary across cultures. If there is a modal recipe, it might differ across persons within a particular cultural context, as well as across cultural contexts. And, of course, just as certain cultures have recipes for food that do not exist in other cultures (e.g., rattlesnakes are fried or barbecued in certain parts of the USA but not eaten as food in others), recipes for certain emotion categories might not exist in a given culture at all.

At the psychological level, the ingredients that make up the recipes might be universal (everyone experiences core affect, knows something about the emotion categories in their culture, has some capacity for controlled attention). And, as with all recipes, the amount of each ingredient is only one factor that is important to making the end product what it is. The process of combining ingredients is also important (are the dry ingredients added to the wet or vice versa? Are they whipped in, stirred in, cut in?). As a result, it is not enough to just identify what the ingredients are, but also how they coordinate, and shape one another, during the process of construction. The process of combination is another potential source of variability that can contribute to the remarkable variety of emotional life.

HYPOTHESIS 3: EMOTIONAL LIFE EXTENDED

Thus far, we have discussed the diversity and variability in psychological events that are conventionally referred to as “emotion”. A third key hypothesis that defines the conceptual act model, however, is that psychological primitives are

⁵ Even if better methods or experiments finally allow scientists to discover that all responses within an emotion category such as “anger” are relatively homogeneous, and that the variability observed within each category is largely due to error of one form or another, this does not, in and of itself, provide unequivocal support for the existence of basic emotion categories in the traditional sense. All individuals within a certain cultural group can produce a remarkably consistent challah as long as a sufficient number of egg yolks are added to the bread batter. Similarly, bread is a category of food that can be found in many different cultural groups of human beings (even though pita tastes very different from nan, both of which are different from a really good rye bread). Nonetheless, bread is an observer-dependent category that is made from a substance (grain) that was, at a certain point in human history, a form money, and that can be used to make other kinds of substances like alcohol. The point is that if the recipe is strong and clear, if there is transmission consistency, and also transmission advantage, learning combined with a psychological constructionist approach could also produce homogeneities. Emotional homogeneities could, in principle, exist as emergent phenomena without emotional essences.

not themselves specific to emotion, and participate to some degree in constructing every psychological moment, regardless of what it is called. The implication is that certain aspects of emotion, for example, core affect, play an intrinsic role in what people consider to be non-emotional events. This idea extends the variety of emotional life even further, because it means that even “cognitions” and “perceptions” are, in a sense, emotional in nature.

Philosophers have believed for centuries that every moment of waking life is to some degree pleasant or unpleasant, so that affect is a basic property of consciousness. This idea continues to be incorporated into contemporary perspectives on consciousness, including Damasio’s somatic marker hypothesis (Damasio, 1999), Edelman’s theory of neural Darwinism (Edelman, 1987; Edelman & Tononi, 2000), Searle’s theory of consciousness (Searle, 1992, 2004), and Humphrey’s theory of conscious sensation (Humphrey, 2006). This idea can also be found in early psychological writing of Spencer (1855), James (1890), Sully (1892), and Wundt (1897).

There is, in fact, some evidence to support the idea that core affect is a fundamental feature of consciousness. The broad, distributed circuitry for core affect projects both directly and indirectly to sensory cortices and coordinates sensory processing in the entire cortical mantle via a series of bottom-up and top-down routes (see Barrett & Bar, 2009; Duncan & Barrett, 2007, for summaries). Because core affect modulates sensory processing, any psychological process that draws on sensory information will have an affective quality to it.

It should not be surprising, then, that affect is a central feature in many traditionally “non-emotional” psychological phenomena, including attitudes (e.g., Cacioppo & Berntson, 1994; Eagly & Chaiken, 1998; Ito & Cacioppo, 2001), stereotyping and prejudice (e.g., Cacioppo & Berntson, 2001; Forgas & Fiedler, 1996; Mackie & Hamilton, 1993; Moreno & Bodenhausen, 2001), verbal communication and negotiation strategies (e.g., Forgas, 1998, 1999a,b), judgement and decision making (e.g., Forgas, 1995; Haidt, 2002; Slovic, Finucane, Peters, & MacGregor, 2002), predicting the future (e.g., Gilbert & Ebert, 2002; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998), and health (Gallo, Bogart, Vranceanu, & Matthews, 2005). Core affect provides a common metric (or what neuroeconomists call a “common currency”) for comparing qualitatively different events (Cabanac, 2002), and can serve as the basis for moral judgements of right and wrong (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001; Haidt, 2001). It also serves as a basic aspect of language comprehension. A speaker’s tone of voice (speaking rate, tone of voice, and intonation) and the acoustical cues to the identity of a speaker routinely impacts the affective state of the listener (Nygaard & Lunders, 2002; Owren & Rendall, 1997) and these cues influence lexical processing (Schirmer & Kotz, 2003; Wurm, Vakoch, Strasser, Calin-Jageman, & Ross, 2001). Affective tone even influences the perception

of spoken words, making it easier to recognise some words and harder to recognise others (Nygaard & Queen, 2008). A recent paper outlines the hypothesis that core affect is important in normal object perception (see Barrett & Bar, 2009). People see with feeling. They “gaze”, “behold”, “stare”, “gape”, and “glare”. Without affect, there is visual sensation, but no sight.

In a fundamental sense, then, the conceptual act model suggests that the broader categories of “emotion”, “cognition”, and “perception” reflect subjective distinctions rather than distinctions in kind, thereby broadening the variety of emotional life. The clearest evidence for this point is the fact that these categories of the mind seem not to be respected at the level of the brain. Many of the brain areas involved with the emergence of emotional episodes are typically considered cognitive (cf. Barrett et al., 2007c; Duncan & Barrett, 2007; Kober et al., 2008; a similar point is made by Pessoa, 2008). And areas that are involved in affective processing (e.g., ventromedial prefrontal cortex and closely related anterior cingulate) are involved in a range of cognitive phenomena; for example, vmPFC is part of the so-called “default network” that is active during spontaneous, highly associative mental activity that occurs in the absence of an eliciting stimulus, and that is also active when remembering the past, envisioning the future, when inferring the mental state of another person, when forming first impressions, in fictional imaginings, in emotion regulation, and moral decision making. This network is disrupted in schizophrenia, autism, and Alzheimer’s disease (see Bar, 2007; Buckner, Andrews-Hanna, & Schacter, 2008, for reviews).

HYPOTHESIS 4: THE POWER OF WORDS

The final defining hypothesis of the conceptual act model is that language play a central role in making an instance of emotion what it is. If the psychological events people refer to as “fear” have no signatures (no known statistical regularities to ground the categories), then how do people learn the category? What serves to glue the various instances of anger together into a single category if they look very different from one another? According to the conceptual act model, the answer is *a word*. This is consistent with Searle’s (1995) view that the ontologically subjective (or observer-dependent) categories with no real statistical regularities of their own are grounded in words. It is as if the phonological form of the word introduces a statistical regularity where none existed before, gluing very different instances together into a single coherent category.

Words are powerful in human experience. Words facilitate the learning of novel categories (Lupyan, Rakison, & McClelland, 2007). As early as 6 months of age, words guide an infant’s categorisation of animals and

objects by directing the infant to focus on the obvious and inferred similarities shared by animals or objects with the same name (Booth & Waxman, 2002; Fulkerson, Waxman, & Seymour, 2006). Words even allow infants to supersede perceptual features and group things together that look and sound nothing alike (Dewar & Xu, 2009; Plunkett, Hu, & Cohen, 2008). Xu, Cote, and Baker (2005) refer to words as “essence placeholders” because a word allows an infant to categorise a new object as a certain kind, and to make inductive inferences about the new object based on prior experiences with other objects of the same kind. Words are ontologically powerful for nominal kinds (observer-dependent categories that exist because a group of people have a shared concept and name it with a word). In fact, a nominal kind might not exist without a word.

This perspective suggests that words provide an important top-down context in emotion. For example, emotion words cause a perceptual shift in the way that emotional faces are seen; morphed faces depicting an equal blend of happiness (or sadness) and anger were encoded as angrier when those faces were paired with the word “angry” and even angrier when participants were asked to explain why those faces were angry (Halberstadt, 2005; Halberstadt & Niedenthal, 2001). Verbalising any words at all disrupts the ability to make correct perceptual judgements about faces, presumably because it interferes with access to judgement-necessary language (Roberson & Davidoff, 2000; Roberson, Damjanovic, & Pilling, 2007). Our lab has reported evidence that disrupting the accessibility of emotion words impairs emotion perception (Lindquist, Barrett, Bliss-Moreau, & Russell, 2006), and we now have evidence that such disruption interferes with the encoding of the emotional features of faces in the first place (Gendron, Barrett, Lindquist, & Barsalou, unpublished data).

The potential implications of these findings for understanding the variety of emotional life are enormous. They suggest that what people come to know about emotion via socialisation and acculturation practices influences might influence what they actually feel, so that cultural differences in emotion language might be formative for cultural differences in feeling. The model also suggests that wielding emotion language is a skill that is related to emotional intelligence and can potentially be trained. Increasing a person’s emotion vocabulary might be one avenue for diversifying their emotional experiences. For example, the conceptual act model would predict that individuals with emotional expertise who have differentiated categories corresponding to the words “irritation”, “frustration”, and “annoyance” would experience and perceive a greater variety of emotional states than those who treat all three words as interchangeable with “anger”. Furthermore, the model predicts that multicultural individuals will show significantly more diversity in their range of emotions than those who are acculturated within a single culture.

CONCLUSION

Regardless of how they account for it, very few people would deny the variety in emotional life. The fear of not finishing a paper on time does not feel the same as the fear of climbing a mountain. The fear of giving a speech does not look the same as the fear of facing an enemy (even when it is across a boardroom table). The fear that I feel in any of these instances may not look or feel the same as they do for you, and some people will never experience these occurrences of fear at all. In this paper, I have outlined a conceptual framework that predicts the existence of this variety, and does not try to explain it away after the fact. Being a relatively new model (less than a decade old), the conceptual act model is still a work in progress. Many of its basic hypotheses are in the process of being tested, and the jury won't be in for some time. That being said, the conceptual act model is consistent with existing cognitive neuroscience research on the mind and emotion, and easily accounts for the tremendous variability in emotional life that has been observed both inside and outside the lab. And it has generated novel hypotheses about the richness and diversity of emotional life that even James did not suspect.

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