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COMMENTARY

What Basic Emotion Theory Really Says for the Twenty-First Century Study of Emotion

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Abstract
Basic emotion theory (BET) has been, perhaps, the central narrative in the science of emotion. As Crivelli and Fridlund (J Nonverbal Behav 125:1–34, 2019, this issue) would have it, however, BET is ready to be put to rest, facing "last stands" and "fatal" empirical failures. Nothing could be further from the truth. Crivelli and Fridlund's outdated treatment of BET, narrow focus on facial expressions of six emotions, inattention to robust empirical literatures, and overreliance on singular "critical tests" of a multifaceted theory, undermine their critique and belie the considerable advances guided by basic emotion theory.

Keywords Basic emotion · Facial expression · Vocal expression

Open-Ended Progress Toward a Taxonomy of Emotions

In their historical survey of basic emotion theory, Crivelli and Fridlund repeatedly return to what should be a destabilizing problem for the field: there is no consensual definition of emotion. Given this assertion, how might a science of emotion progress? Might it not be better to abandon such scientific constructs as "emotion" and "emotional expression" for other theoretical terms? Doesn't such a crisis pave the way for new paradigms?

In offering this assessment, Crivelli and Fridlund fail to consider Ekman's (1992) article "*An Argument for Basic Emotions*," the most generative statement of BET to date (Ekman 1992). In that article, Ekman detailed nine criteria to guide the scientific study of emotion: six differentiated emotions from related phenomena (moods, sentiments, traits); and three pointed to empirical approaches to differentiate distinct emotions from one another (in terms of antecedents, physiology, and signaling behavior). In Table 1, we summarize these criteria, as well as two other elements of emotion: specific action tendencies; and emotion specific effects upon cognition, or appraisal tendencies (Lerner et al. 2015). Although BET-inspired researchers diverge in specific ways, they are guided by the broader assumption of this framework—that

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Table 1 BET criteria for the empirical study of emotion

How do emotions differ from other phenomena?	
Brief duration	
Unbidden	
Coherence among response systems	
Quick onset	*What differentiates emotions from one another*?
Presence in other primates	Distinct primate homologies
Physiological correlates	Distinct physiological correlates
Particular antecedent	Distinct universal antecedents
Reported experience	Distinct reported experiences
Particular signal	Distinct universal signals
Behavioral tendency	Distinct behavioral tendencies
Cognitive focus	Distinct appraisal tendency

emotions are measurable states that evolved to serve distinct functions in human social life (e.g., see Tracy 2014; Tracy and Randles 2011, for reviews of current BET approaches).

What should be clear is that BET offers a clear basis for defining emotion: an emotion is a brief state that arises following appraisals of interpersonal or intrapersonal events, and involves distinct antecedents, signaling, physiology, and action and appraisal tendencies that demonstrate some coherence and are observed in related form in our primate relatives. This consensual framework has been seminal to literatures on: emotion regulation (Gross 2015), emotion patterning in the brain (Nummenmaa and Saarimäki 2017), emotion specific influences upon cognition (Lerner et al. 2015), and emotion-related peripheral physiological response (Kreibig 2010).

As the aforementioned empirical literatures reveal, BET does not "constrain" the science of emotion, as Crivelli and Fridlund assert. It does not dictate that phenomena must first meet all of the aforementioned criteria before being deemed worthy of study. Just the opposite—it provides a generative framework, guiding the study of different facets of emotion. Nor is this theorizing biased by scientists' preconceptions; instead it offers open-ended empirical criteria for studying any state a human living in any cultural tradition might experience. Guided by this framework, hundreds of studies have detailed distinctions in the antecedents, appraisals, and signaling behavior of anger, disgust, fear, surprise, happiness, and sadness (Lench et al. 2011). BET has inspired new approaches to the study of universal emotion antecedents (Sznycer et al. 2016); insights gleaned from studies of nonhuman primates, for example in how touch may be a means of signaling gratitude (Bonnie and de Waal 2004); how emotions influence judgment and decision making (Lerner et al. 2015); and new approaches to studying the universality of emotion-related physical sensation (Nummenmaa et al. 2014). Framed by BET, the field is making open-ended progress toward a taxonomy of emotions.

Subjective Experience and Self-Report

Emotional experiences are complex, involving automatic or unconscious processes, representations of bodily sensations, interpretations of the social context, associations and memories, and semantic knowledge. Notwithstanding this complexity, progress has been made with studies that use self-report measures of emotion-related phenomena (Cowen

and Keltner 2017; LeDoux and Brown 2017; Lench et al. 2011). The justification for studying reported experiences is straightforward: plainly, in our everyday vernacular, emotions are inextricably tied to feelings. A science that disavows the connection between emotion and subjective experience would, in effect, abandon the goal of explaining the phenomena that people actually deem to be emotional in nature (LeDoux and Hofmann 2018).

Self-report has clear limitations. No scientist would argue that self-report is a direct readout of multifaceted subjective experience (Cowen and Keltner 2017; LeDoux and Hofmann 2018). Equally outlandish, however, is Crivelli and Fridlund's suggestion that because self-report is merely a "proxy" for subjective experience, its study is "empirically unworkable." Self-report, like any behavioral response, carries information about a person's internal state; it varies systematically as a function of the context people are in, their expressive signals, physiological responses, and subsequent behaviors (Lench et al. 2011; Mauss et al. 2005). Arguments that self-reports are mere proxies of subjective experience ignore empirical literatures attesting to how self-reports track emotion-related responses (e.g., Lench et al. 2011), important empirical advances in understanding when self-reports are more closely tied to emotion-related response (e.g., Mauss et al. 2005), and new quantitative and methodological approaches to the understanding of the processes by which people rely on discrete emotion concepts and appraisals to report upon subjective experience (Cowen and Keltner 2017, 2018).

The Rise of Social Functionalism

The focus in our contribution in this issue is on mapping a taxonomy of emotional expression and experience of upwards of 20 states (e.g., Cordaro et al. 2018; Cowen and Keltner 2017; Keltner and Cordaro 2016; Shiota et al. 2017). In Crivelli and Fridlund's view, this progress reflects unprincipled "shifting sands", with researchers including cats (new emotions such as envy, pride, or sympathy) within the category of dogs (Ekman's original six). But the study of these "new" proposed or potential basic emotions directly draws upon the framework that Ekman outlined; BET, like any good theory, has been generative, and provided a framework for uncovering novel findings not anticipated in the original statements of the theory.

Researchers working within a BET framework have increasingly focused on the social functions of emotions, a development Crivelli and Fridlund ignore (Keltner and Haidt 1999; van Kleef 2016; van Kleef et al. 2016). Social functionalist approaches are organized around two core assumptions. First, distinct emotions enable humans to meet the challenges and opportunities that define those relationships which are critical for human survival, reproduction, and cooperative social living. Framed by BET, the science of emotion has extended into new domains. Theorizing about human and nonhuman hierarchies has shaped empirical studies and theoretical analysis of embarrassment, pride, shame, guilt, and envy (Cheng et al. 2010; Keltner and Buswell 1997; Sznycer et al. 2016; Tracy et al. 2010). Bowlby's theory of attachment and loss, conceptually similar to BET in many ways, has guided the study of emotions that enable interpersonal attachments of different kinds, including desire, love, sympathy, and jealousy (Diamond 2003; Goetz et al. 2010; Gonzaga et al. 2001). The same can be said of recent analyses of positive emotions, including amusement, contentment, enthusiasm, and joy (Shiota et al. 2017). BET lays out clear

criteria for the study of different emotions, and the hundreds of peer-reviewed studies and theoretical reviews speak to the generativity of this framework.

A second core assumption of social functionalism is that emotional expressions coordinate individuals' behaviors within social interactions. More specifically, emotional expressions came to serve three important functions within social interactions: to provide information to others; to serve as incentives for social behavior; and to evoke specific responses in observers (Keltner and Kring 1998; van Kleef 2016). This framework flows out of BET and has shifted the field's approach to understanding the meaning of emotional expression.

In principled fashion, then, the science of emotion has moved toward a more comprehensive taxonomy of emotion, now encompassing upwards of 20 states. As BET has progressed, as any good theory does, it faces new empirical questions. For example, how might researchers deploy more open-ended methods to inform our understanding of a taxonomy of emotions (see Cowen and Keltner 2018; Jack et al. 2012)? What do these more complex emotion taxonomies look like in different cultures? To what extent are the boundaries between emotion categories discrete, or bridged by gradients of meaning (Cowen and Keltner 2017)?

Multimodal Expression and the Conceptualization of Emotion

The study of emotional expression has moved well beyond the prototypical face-only expressions of six emotions. This development was anticipated by Ekman himself, who noted "facial muscle movement is only one form of expression," and highlighted "nonverbal expression" rather than "facial expression" in his definitive theoretical treatment of BET (see Table 1). Research in this area has established that each emotion is likely to be expressed in a variety of ways, a claim that Ekman likewise anticipated, noting (without data) that anger might be expressed in sixty different ways (Ekman 1992). Since then, empirical studies have documented within category variants of laughter, pride, embarrassment, love, desire, emotion-related tactile contact, and vocal bursts of 24 emotions, as we point to in our review.

The understanding of the processes by which people ascribe meaning to emotional expression in acts of conceptualization has likewise become much more sophisticated (Cowen and Keltner 2017). Now it is increasingly recognized that emotional expressions communicate: (1) current feeling; (2) what is happening in the present context; (3) intentions or action tendencies; (4) desired reactions in others; and (5) characteristics of the social relationship (for review, see Scarantino 2017). This is only fitting, for emotion concepts themselves—"anger," "embarrassment"—are more than references to interior states; they involve script-like structures of causes, sensations, courses of action, anticipated reactions, and cultural norms about regulation (e.g., Shaver et al. 1987). Any given emotion expression can, therefore, communicate all five of these forms of information, or any one (or two, three, or four) of them, depending on other features of the context, expresser, and perceiver.

Critiques of BET, such as that of Crivelli and Fridlund, often fail to take into consideration these developments, remaining focused, instead, on whether people match single emotion words to prototypical facial expressions of emotion. This leads to several inferential mistakes. Crivelli and Fridlund suggest that the observation that pride has at least two distinct (albeit overlapping) displays undermines BET; instead, this is readily anticipated by BET's analysis of the varieties of expressive behaviors that signal a specific emotion.

Cross-cultural studies that fail to document one-to-one mappings between emotion words and prototypical facial expressions likewise suffer from similar limitations. Emotion words themselves are inherently ambiguous and fail to capture the richer conceptual structure people rely on when ascribing meaning to emotional expression. Emotion recognition studies are moving toward the study of the various kinds of information that expressions are likely to signal (e.g., Cordaro et al. 2016).

New Approaches to Variation and Universality

Within Crivelli and Fridlund's treatment, BET posits an invariant relationship between a distinct emotional experience, a prototypical facial expression, and observer inferences about the expressed emotion. Evidence that such a mapping does not occur, by implication, serves as a fatal failure of the theory. We have already seen that BET anticipated that people express the same emotion in varying ways. More generally, Scarantino (2014) has discussed how BET is compatible with multiple kinds of variability in emotion-related response and its meaning in observers' eyes (conceptual, contextual, and interaction dependent). Furthermore, studies showing that facial expressions shift in their meaning depending on the expressive behavior simultaneously occurring in other modalities, such as posture or gesture (e.g., Aviezer et al. 2008), do not indicate that facial expressions have no context-free meaning, but rather that their meaning is part of multimodal expressions, consistent with current understanding of BET.

More generally, Crivelli and Fridlund oversimplify how researchers working within BET approach universality (or cross-cultural similarity) and cultural variation in emotional expression. The field is not characterized by researchers traveling the planet "dead set on showing universality." Instead, results from cross-cultural research are far from a foregone conclusion. A number of nonverbal emotional expressions have "failed" tests of cross-cultural universality (including in studies conducted by researchers who were sympathetic to BET); in such cases researchers have concluded that those particular expressions did not generalize across cultures (e.g., achievement in Sauter et al. 2010; see also Cordaro et al. 2016). Nor do most BET researchers hold the simplistic view that evidence of universality necessarily implies evolution by natural selection, instead acknowledging that evidence of cross-cultural similarity might also be explained by cultural processes common to cultures around the world, a thesis all the more plausible in today's world of shared culture on the internet.

Instead, the study of emotional expression has moved away from such Manichean distinctions—expression is either shaped by evolution or culturally constructed—to systematic approaches to understanding how both classes of processes shape emotional expression in compelling ways. With new empirical methods and statistical tools, progress is being made in understanding the sources of within-category variations in expression, in particular in terms of culture (Elfenbein et al. 2007). Members of cultures develop culturally specific dialects in which they express emotion in ways that are recognized only within their own culture. In one recent study of expressive behavior across five cultures, results showed that although 50% of multimodal behaviors specific to a given expression of emotion were shared across cultures, every emotion also had culture-specific dialects (Cordaro et al. 2018). Crivelli and Fridlund do not grapple with these developments, nor with studies of how emotional expression is shaped by culturally specific values (Tracy and Matsumoto 2008; Tsai et al. 2016) and regulation tendencies (Matsumoto et al. 2008). This research

is arriving at a more nuanced view. The vocal expressions of some emotions (e.g., the laugh) appear to be more universal than others (e.g., anger) (Cordaro et al. 2018). Emotions vary in their universality depending on the modality studied (e.g., touch is the only reliable modality through which gratitude is conveyed; the voice more reliably conveys certain emotions, such as awe, than the face; Cordaro et al. 2016).

Crivelli and Fridlund hew to one view of science: that new paradigms (theirs, although what that might be is not well specified in their essay) are required when fields cannot define or measure the phenomenon of interest, and narrow empirical tests can eviscerate an entire theory. We see no evidence in the hundreds of studies referred to in our review for such a perspective on BET. Instead, we see a theory that, like almost all good theories in the social sciences, is evolving with time and advances in methods, measures, and findings, and that is revealing emotional expression to be much richer, nuanced, and central to social life than long ago thought.

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