

Research Article

Constructing Emotion

The Experience of Fear as a Conceptual Act

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ABSTRACT—*This study examined the hypothesis that emotion is a psychological event constructed from the more basic elements of core affect and conceptual knowledge. Participants were primed with conceptual knowledge of fear, conceptual knowledge of anger, or a neutral prime and then proceeded through an affect-induction procedure designed to induce unpleasant, high-arousal affect or a neutral affective state. As predicted, only those individuals for whom conceptual knowledge of fear had been primed experienced unpleasant core affect as evidence that the world was threatening. This study provides the first experimental support for the hypothesis that people experience world-focused emotion when they conceptualize their core affective state using accessible knowledge about emotion.*

Emotions are ubiquitous: People easily see emotion in others and experience their own emotional reactions as unbidden. Underlying these day-to-day experiences is the implicit assumption that emotions are events that people *have* (or that, perhaps, have *them*). To date, science has largely followed this intuition in assuming that emotions like fear, anger, sadness, and so on are natural-kind categories that cannot themselves be broken down into more basic parts. Each emotion, once triggered, is presumed to produce a coordinated array of observable facial behaviors, physiological reactions, behavioral actions, and feelings. Recent reviews of the literature call this natural-kind view of emotion into question, however (Barrett, 2006a; Barrett, Lindquist, et al., 2007), and suggest the alternate hypothesis that the experience of “having an emotion” is a state of mind constructed when two more basic psychological ingredients are combined in the blink of an eye and with very little effort. In this report, we present experimental evidence that emotions are constructed psychological events.

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EMOTIONS AS CONCEPTUAL ACTS

The conceptual-act model of emotion is a psychological constructionist approach to emotion because it assumes that the psychological events that people call “anger,” “sadness,” “fear,” and so on, are not basic building blocks of the mind, but are constituted from the interplay of more basic psychological ingredients that are not themselves dedicated to emotion. We propose that the experience of emotion results when people conceptualize their core affective state as an instance of emotion (Barrett, 2006b; Barrett, Lindquist, et al., 2007; Barrett, Mesquita, Ochsner, & Gross, 2007). Core affect is an ongoing, ever-changing, psychologically primitive state that has both hedonic and arousal-based properties (see Barrett, 2004, 2006c; Russell, 2003; Russell & Barrett, 1999). The events that people call “anger,” “sadness,” “fear,” and so on, result when core affect is conceptualized using knowledge of emotion (effectively, what a person knows about the category of anger, sadness, or fear, etc.). In an instant, conceptualization proceeds efficiently and automatically, transforming internal sensory information from the body into a psychologically meaningful state by combining it with external sensory information about the world and situation-specific knowledge of emotion learned from prior experience. The result is an intensional state that is at once affective and conceptual.

This model explains how two categories of emotion experience differ from one another (e.g., how *anger* differs from *fear*) and also predicts that different instances within a category will vary (e.g., different instances of fear might vary from one another). One important source of within-category variability is the *locus* of conceptualization. In some cases, core affect is conceptualized as a property of the self, resulting in second-order, reflective, or self-focused emotion experience that can be labeled with emotion adjectives (e.g., “I am afraid,” “I am angry,” “I am sad”). In other cases, core affect is conceptualized as a property of the world, resulting in what philosophers call first-order, nonreflective, phenomenal, or world-focused emotion (Chalmers, 1996; Lambie & Marcel, 2002); for example, the world is experienced as threatening (in fear), a person is experienced as

offensive (in anger), or the situation is experienced as full of loss and sorrow (in sadness). In this view, cognitions about the world are not separate from and do not cause emotion—they constitute it. Older models of emotion (e.g., Dewey, 1895) considered self-focused and world-focused forms of emotion as two sides of the same coin: Experiencing the world as threatening does not cause the experience of fear—it *is* an experience of fear (for a discussion, see Barrett, Mesquita, et al., 2007). In our view, you might conceptualize an unpleasant, highly aroused state in a self-focused way and label it as *fear* in some instances, but as *anger* in others. In still other instances, you might experience world-focused emotion and take your core affective state as evidence that the world is threatening or that your boss is a jerk. In each instance, core affect combines with conceptual knowledge about emotion, much in the same way that ingredients in a recipe combine.

THE PRESENT STUDY

In the present study, we examined the hypothesis that a world-focused experience of fear can be psychologically constructed when unpleasant, high-arousal core affect is conceptualized as evidence that the world is threatening. We manipulated core affect after priming knowledge about fear, knowledge about anger, or neither type of knowledge. We then assessed the world-focused experience of fear by assessing participants' aversion to risk. We did not have participants provide self-focused reports of fear requiring explicit ratings or the use of emotion adjectives. The presence of such adjectives might have interfered with the efficacy of our priming manipulation and would have left our findings open to alternate interpretations. Had participants primed with conceptual knowledge of fear endorsed more fear adjectives than participants who received other primes, for example, these findings could have been interpreted as merely an artifact of priming.

We chose risk aversion as our world-focused measure of fear because many appraisal models of emotion link an experience of the world as threatening with the experience of fear (for a review, see Scherer & Ellsworth, 2003), and because the experience of fear has been extensively linked to heightened risk aversion (Lench & Levine, 2005; Lerner & Keltner, 2000, 2001; for a review, see Loewenstein, Weber, Hsee, & Welch, 2001). We predicted that participants who were primed with conceptual knowledge about fear and who underwent an unpleasant affect-induction procedure would be more likely to experience the world as threatening and would therefore be less willing to take part in a series of hypothetical risky activities than would participants who were merely caused to feel unpleasant, participants who were primed with conceptual knowledge about fear but who underwent a neutral affect induction, or participants who were primed with conceptual knowledge about anger and caused to feel unpleasant. We included this last condition to demonstrate that changes in risk aversion were specific to the

psychological construction of world-focused fear, and were not related to all negative emotional states.

We did not predict that participants made to feel unpleasant in the context of accessible knowledge about anger would show decreased risk aversion because the published literature does not provide evidence for a clear link between the experience of anger and risk. Many appraisal models link the experience of anger to increased feelings of control (see Scherer & Ellsworth, 2003), and in at least one model of emotion, appraisals of control are thought to translate into decreased risk aversion (e.g., Lerner & Tiedens, 2006). Several published studies have reported a link between decreased risk aversion and the experience of anger (when compared with the experience of fear; Lerner, Gonzalez, Small, & Fischhoff, 2003; Lerner & Keltner, 2000, 2001), but they did not include the necessary control conditions to clearly show that the experience of anger is associated with increased risk taking relative to a neutral state. Furthermore, there is evidence that the experience of anger is unrelated to changes in risk aversion. In one study, participants who felt angry were not more risk averse than those who felt happy or neutral (Lench & Levine, 2005). This study replicated Lerner and Keltner's (2001, Studies 2 and 3) findings that participants scoring high in dispositional happiness showed the same degree of risk aversion as those scoring high in dispositional anger. Together, these findings suggest that changes in risk perceptions do not specifically index the world-focused experience of anger.

METHOD

Participants

Participants were 108 undergraduate students at Boston College (53 females, 55 males). They received \$10 or 1 credit toward the psychology department's research requirement.

Procedure

For the priming manipulation, participants viewed a photograph showing two males in conversation (Fig. 1); one of the men depicted behavior mildly typical of fear (his eyes were widened, his hands were splayed, and he leaned back slightly), and the other depicted behavior mildly typical of anger (his eyes were narrower, his hands were balled in a fist, and he leaned forward slightly). In the fear-prime condition, participants were asked to tell a story about the man on the left from a third-person point of view; in the anger-prime condition, they were asked to tell a story about the man on the right. We used the same photograph in the neutral-prime condition but cropped out the hands and forearms, rendering the content of the photograph less emotional; in this condition, participants were told that the characters were having a discussion about trees found in New England and were asked to elaborate on the contents of the conversation. As a manipulation check, two raters coded the stories for the number of words or phrases related to fear, anger,



Fig. 1. The priming stimulus. Participants in the fear- and anger-priming conditions viewed this stimulus and told a story about either the fearful (in the fear-priming condition) or the angry (in the anger-priming condition) character. Participants in the neutral-priming condition saw a cropped, less emotional version of this stimulus and told a story about a neutral conversation the two characters were having.

unpleasant affect, pleasant affect, high-arousal affect, and low-arousal affect (the raters discussed any discrepancies between judgments until 100% reliability was achieved). This coding procedure allowed us to assess the full range of emotional (fear, anger) and affective (unpleasant, pleasant, high arousal, and low arousal) content produced by participants during the priming manipulation and allowed us to verify that our priming procedure was, in fact, effective.

Participants next completed the affect-induction procedure. We used the continuous music technique (Eich, Macaulay, & Ryan, 1994; Eich & Metcalfe, 1989) to induce either an unpleasant, high-arousal state or a neutral state. Participants listened to affectively evocative or neutral music while imagining a highly unpleasant or neutral scenario. Prior to the induction, participants were asked to imagine any past or future experience they could think of that would make them feel “unpleasant and highly aroused (activated)” or “neither pleasant, unpleasant, activated, nor deactivated.” Participants were told that the music would contribute to their affective state and that they should “imagine the situation unfolding as the music plays.” Participants made on-line recordings of their affective state throughout the induction using a computerized two-dimensional affect grid on which one axis represented hedonic valence (pleasantness to unpleasantness) and the other represented arousal (activation to deactivation; Russell, Weiss, & Mendelsohn, 1989). The induction procedure ended when participants reported experiencing the requisite level of affect by charting their feelings in the appropriate area of the grid for 4 to 5 min.

Participants then completed the Activity Rating Questionnaire, our measure of world-focused fear. This questionnaire consisted of 50 hypothetical risky behaviors (e.g., “frequent

binge drinking,” “regularly riding a bike without a helmet”). Participants were asked to indicate whether they would be likely to engage in each behavior by writing “Y” (“yes”) or “N” (“no”) next to the behavior. The Activity Rating Questionnaire was created on the basis of the reports of a separate group of same-age participants, who were asked to compile a list of activities that they deemed to be risky.

Finally, participants were asked to write in their own words what they imagined during the affect induction. This was included as a manipulation check to ensure that participants complied with task instructions. Imagery narratives were coded for the number of words or phrases related to fear, anger, unpleasant affect, pleasant affect, high-arousal affect, and low-arousal affect. We coded separately for emotional and affective content as it related to the self (e.g., “I imagined a time I felt really fearful”) and the world (“I imagined a time when I was almost in a fatal car accident”).

RESULTS

Priming of Emotion Knowledge: Manipulation Check

A between-subjects multivariate analysis of variance (MANOVA) was performed on the content generated during the priming procedure. The stories’ mean usage of emotional (fear, anger) and affective (unpleasant, pleasant, high-arousal, and low-arousal) content is reported in Table 1. As expected, participants in the fear-priming condition used a greater number of words or phrases related to fear (e.g., “fear,” “apprehension,” “wide eyes,” “get away,” “threat”) than did participants in either the anger- or the neutral-priming condition, $F(2, 108) = 70.52$, $p < .001$; $t(70) = 8.75$, $p < .001$, and $t(70) = 8.45$, $p < .001$, respectively. Participants in the anger-priming condition used a greater number of words or phrases related to anger (e.g., “anger,” “mad,” “aggression,” “clenched fist,” “hurt the other person,” “broke trust”) than did participants in either the fear- or the neutral-priming condition, $F(2, 108) = 71.88$, $p < .001$; $t(70) = 9.02$, $p < .001$, and $t(70) = 9.34$, $p < .001$, respectively. Participants in the neutral-priming condition included slightly more pleasant words than did those in the fear-priming condition

TABLE 1
Priming Manipulation Check: Mean Emotional and Affective Content in Participants’ Stories

Content	Priming condition		
	Fear	Anger	Neutral
Fear	5.361 (0.352)	0.222 (0.352)	0.250 (0.352)
Anger	1.667 (0.425)	7.833 (0.425)	1.528 (0.425)
Unpleasant affect	1.306 (0.265)	1.583 (0.265)	1.722 (0.265)
Pleasant affect	0.056 (0.076)	0.028 (0.076)	0.278 (0.076)
High-arousal affect	1.222 (0.223)	1.111 (0.223)	1.167 (0.223)
Low-arousal affect	0.0 (0.050)	0.111 (0.050)	0.056 (0.050)

Note. Standard errors are given in parentheses.

and significantly more than did those in the anger-prime condition, $F(2, 108) = 3.21, p < .04$; $t(70) = 1.72, p < .09$, and $t(70) = 2.08, p < .04$, respectively.

Induction of Affect: Manipulation Check

Coding of the mental imagery that participants used during the affect-induction procedure (but recalled at the end of the experiment) confirmed that the desired affective states were induced successfully (see Table 2). A 2 (affect induction: unpleasant, high-arousal vs. neutral) \times 3 (prime: fear vs. anger vs. neutral) between-subjects MANOVA on the content contained in the imagery narratives indicated that participants who underwent the unpleasant-affect induction imagined more general unpleasant content (including both more fear and more anger content) and more high-arousal content than did those in the neutral-affect induction. Those participants who completed the neutral-affect induction imagined more low-arousal, world-focused content than did those participants who completed the unpleasant-affect induction. Together, these findings indicate that participants who underwent the negative-affect induction cultivated a general unpleasant affective state (by imagining scenarios that were unpleasant and highly arousing in affective content while listening to affectively evocative music), whereas participants who underwent the neutral-affect induction cultivated a low-arousal state that was neither pleasant nor unpleasant.

We did not find a main effect of prime condition or an Affect Induction \times Prime interaction, which suggests that priming played no role in what imagery participants used during the affect induction. Greater fear content in imagery reported by participants who were primed with conceptual knowledge about fear and made to feel unpleasant, and greater anger content in imagery reported by participants who were primed with con-

ceptual knowledge about anger and made to feel unpleasant, would potentially be evidence against our hypothesis that emotions are constructed mental events because conceptual priming could have merely triggered the experience of an emotional state by causing participants to imagine or “re-live” a prior experience of fear or anger during the affect induction. Thus, the absence of priming effects in imagery data confirmed that we successfully and separately primed emotion knowledge (during the priming manipulation) and induced undifferentiated unpleasant, high-arousal core affect (during the affect induction).

Risk Aversion: Index of Fear in the World

As predicted, participants primed with fear knowledge experienced unpleasant, high-arousal affect as world-focused fear. A 2 (affect induction: unpleasant, high-arousal vs. neutral) \times 3 (prime: fear vs. anger vs. neutral) between-subjects analysis of variance on willingness to engage in risky behavior yielded a significant Affect Induction \times Prime interaction, $F(2, 108) = 2.93, p < .058, \eta^2 = .054$. Figure 2 presents the mean number of risky activities endorsed as a function of condition. A doubly centered interaction contrast (cf. Abelson & Prentice, 1997) confirmed our a priori interaction of interest, $F(1, 102) = 7.41, p < .01$. Participants who felt unpleasant and highly aroused in the presence of conceptual knowledge of fear ($M = 20.50$) were significantly less likely to endorse risky activities than participants who felt unpleasant and highly aroused in the presence of conceptual knowledge of anger ($M = 26.16$), those who merely felt unpleasant and highly aroused ($M = 25.72$), those who were in a neutral affective state but were primed with conceptual knowledge of fear ($M = 23.61$) or anger ($M = 21.72$), or those who completed the neutral-prime manipulation ($M = 22.56$). Post hoc analyses demonstrated that participants who were

TABLE 2
Affect-Induction Manipulation Check: Mean Emotional and Affective Content in Participants’ Imagery Narratives

Content	Induction condition		Test of significance	
	Unpleasant	Neutral	$F(12, 91)$	p
Fear: self	0.241 (0.070)	0.000 (0.070)	5.948	.016
Fear: world	0.741 (0.125)	0.019 (0.125)	16.130	.001
Anger: self	0.241 (0.059)	0.000 (0.059)	8.475	.004
Anger: world	0.630 (0.107)	0.056 (0.107)	14.496	.001
Unpleasant affect: self	0.426 (0.072)	0.056 (0.072)	13.439	.001
Unpleasant affect: world	1.130 (0.159)	0.130 (0.159)	19.625	.001
Pleasant affect: self	0.093 (0.052)	0.056 (0.052)	0.260	.612
Pleasant affect: world	0.074 (0.065)	0.148 (0.065)	0.645	.424
High-arousal affect: self	0.333 (0.059)	0.000 (0.059)	15.385	.001
High-arousal affect: world	0.704 (0.130)	0.019 (0.130)	13.779	.001
Low-arousal affect: self	0.037 (0.036)	0.111 (0.036)	2.125	.148
Low-arousal affect: world	0.000 (0.059)	0.241 (0.059)	8.6276	.004

Note. Standard errors are given in parentheses. Row labels indicate whether the emotional or affective content is related to the self or to the world.

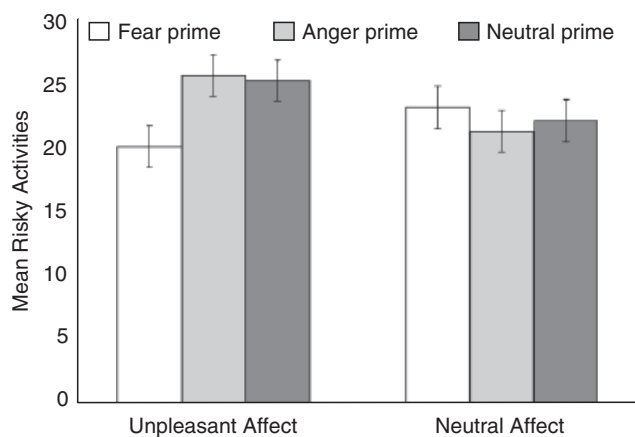


Fig. 2. Mean number of risky activities endorsed per experimental condition.

primed with fear knowledge but were in a neutral affective state did not differ in risk aversion from participants who felt merely unpleasant and highly aroused or those who felt unpleasant and highly aroused in the presence of conceptual knowledge of anger (both $t_s < 1$). Thus, our findings demonstrate that increased risk aversion is specific to the world-focused experience of fear.

DISCUSSION

These findings provide initial evidence that the world-focused experience of fear can be produced by the interplay of two more basic psychological ingredients: core affect and conceptual knowledge of emotion. Feeling unpleasant and highly aroused in the presence of accessible knowledge about fear caused participants to experience fear in the world, as indicated by their aversion to risk. Neither the presence of accessible emotion-concept knowledge nor core affect alone was sufficient to produce the world-focused experience of fear. Furthermore, participants who were primed with conceptual knowledge about anger (another discrete emotion that is unpleasant and highly arousing in content), who felt general unpleasant affect, or who merely experienced increased accessibility of conceptual knowledge about fear (with no change in affect) did not demonstrate increased aversion to risk. Our findings were specific to the construction of fear. In future research, it will be important to assess the generalizability of these findings to other world-focused emotions (e.g., anger, sadness, joy) and to assess the experience of self-focused emotion.

The present findings provide the first experimental evidence that emotions are mental events constructed via combination of the more basic psychological components of core affect and conceptual knowledge of emotion. The conceptual-act model belongs to a class of models known as *psychological constructionist models*, which view emotions as psychological events that are composed of more basic psychological components or ingredients (e.g., Mandler, 1975; Russell, 2003; Schachter & Singer, 1962; Wundt, 1897). Constructionist approaches to

emotion are united in the assumption that the mental events called “anger,” “sadness,” and “fear,” and so on, are not basic building blocks in the mind, but instead are mental events that result from the interplay of more basic psychological ingredients that are not themselves specific to emotion. The most well-known constructionist model was offered by Schachter and Singer (1962), who proposed that emotions are special mental events arising from unexplained or ambiguous sympathetic arousal that is only later made meaningful via affiliations with other people. Yet the demonstration that people can label an ambiguous state of sympathetic arousal as emotional might not be the best empirical evidence that emotions, more generally, are constructed psychological events.

The conceptual-act model is distinct from Schachter and Singer’s (1962) model in several important ways (for a discussion, see Barrett, Lindquist, et al., 2007). First, core affect is not characterized simply as peripheral nervous system activity that is made meaningful only when experienced as ambiguous. Second, conceptualization does not arise from social affiliation or attribution (see also Russell, 2003), but results from categorization, a fundamental cognitive process that proceeds in most cases without explicit awareness or control.¹ Conceptualization of affect proceeds in much the same way that a person instantaneously and automatically combines sensory input of certain wavelengths of the visible light spectrum with conceptual knowledge about color to see the color “red.” Third, and most important, core affective changes and conceptualization do not occur in separate stages, with one preceding the other in a neat linear fashion. Conceptualization is not “turned on” only when there is some sensory change to be understood. Instead, core affective changes and conceptualization are mental processes that are constantly in play, continually shaping one another as they combine like ingredients to make a variety of mental states—only some of which people call “emotion.” These mental ingredients combine according to the principles of constraint satisfaction (see Barrett, Ochsner, & Gross, 2007) even though they can be manipulated separately in a laboratory experiment. The present findings provide the clearest evidence to date for a constructionist model of emotion, and are the first to demonstrate that experiencing core affect in the presence of conceptual content about emotion gives rise to world-focused emotion.

Acknowledgments—We thank Rebecca Hancock for her help with data collection and Maria Gendron for her help with data

¹The conceptual-act model is also distinct from the class of appraisal models of emotion, which conceive appraisals as literal cognitive mechanisms for evaluating the psychological situation and triggering the experience of an emotion. Rather than conceiving of appraisals as the mechanisms of experience, the conceptual-act model conceives of appraisals as descriptions of what the experience of a particular emotion is like. That is, the appraisal that a situation is threatening does not trigger the experience of fear; rather, experiencing a situation as threatening is merely one way of describing what it is like to feel fearful.

coding. Preparation of this manuscript was supported by a National Science Foundation Graduate Research Fellowship to Kristen A. Lindquist and by a National Institutes of Health Director's Pioneer Award (DP1OD003312), a National Institute of Mental Health Independent Scientist Research Award (K02 MH001981), a National Institute of Aging grant (AG030311), and National Science Foundation grants (BCS 0721260, BCS 0527440) to Lisa Feldman Barrett.

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(RECEIVED 9/3/07; REVISION ACCEPTED 2/25/08)