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Same Situation—Different Emotions: How Appraisals Shape Our Emotions

Matthias Siemer
University of Miami

Iris Mauss
University of Denver

James J. Gross
Stanford University

Appraisal theories of emotion hold that it is the way a person interprets a situation—rather than the situation itself—that gives rise to one emotion rather than another emotion (or no emotion at all). Unfortunately, most prior tests of this foundational hypothesis have simultaneously varied situations and appraisals, making an evaluation of this assumption difficult. In the present study, participants responded to a standardized laboratory situation with a variety of different emotions. Appraisals predicted the intensity of individual emotions across participants. In addition, subgroups of participants with similar emotional response profiles made comparable appraisals. Together, these findings suggest that appraisals may be necessary and sufficient to determine different emotional reactions toward a particular situation.

Keywords: emotion, appraisal

Imagine you are being harshly criticized by your supervisor for your deficient response to a critical situation, which in turn had severely negative consequences for other people. What emotions would this situation evoke? Cognitive theories of emotion assume that this essentially depends on how you interpret the situation. You might respond with anger if you believe that the allegations are unjustified because others are to blame. You might respond with shame if you think that this failure revealed your incompetence. You might respond with sadness or guilt if you think about the negative consequences your failure had for others. Or you might respond with, or at least maintain, positive emotions if you think you have done an excellent job and what went wrong is not your responsibility at all.

The idea that people respond with different emotions to the same situation depending on how they interpret, or *appraise*, the situation is one of the core assumptions of cognitive appraisal theories of emotions. On this view, it is the appraisal of a situation, not the situation per se, that determines the quality and the intensity of an emotional response. Specifically, appraisal theories of emotion assume that the emotions elicited by an event are determined by how the event is interpreted along a number of appraisal dimensions. These dimensions include the importance of the event, its expectedness, the responsible agent, and the degree to which it is possible to control the event. Different versions of this assumption can be found in almost all cognitive appraisal theories of emotion (Arnold, 1960; Ellsworth & Scherer, 2003; Lazarus, 1991; Ortony, Clore, & Collins, 1988; Reisenzein, 2001; Scherer, 2001).

There are two possible (nonexclusive) versions of this core appraisal claim. The first version holds that different appraisal profiles are *sufficient* conditions to evoke different emotional reactions toward the same situation, that is, different appraisals are all that is needed to evoke different emotions, even if all other circumstances are the same. The second version holds that different appraisal profiles are *necessary* conditions to evoke different emotional reactions toward the same situation, that is, the same situation cannot evoke different emotions unless it is appraised differently. In the next section, we review each claim and its supporting evidence in more detail. This review suggests that both claims have been subjected to surprisingly few empirical tests (see Scherer, 1997 for an exception).

Appraisals as Sufficient Causes of Emotion

The first version of the core appraisal hypothesis is that appraisals are sufficient causes of the quality and intensity of an emotional response (*sufficiency hypothesis*). This translates into the prediction that different appraisals of the same situation will be sufficient to result in different emotional responses. The majority of emotion researchers with a cognitive orientation subscribe to this assumption (Roseman & Smith, 2001). Indeed, even authors who assume that emotions can have noncognitive causes often endorse the notion that certain cognitions are sufficient to evoke emotional responses (Izard, 1993). In line with this reasoning, previous tests of appraisal theories have consistently suggested that different emotions are associated with distinct appraisal patterns (for reviews see Ellsworth & Scherer, 2003; Roseman & Smith, 2001).

Unfortunately, although these results are consistent with (i.e., do not contradict) this hypothesis, the majority of existing appraisal research has two limitations that make it difficult to draw firm conclusions regarding the validity of the sufficiency hypothesis.

Matthias Siemer, Department of Psychology, University of Miami, Florida; Iris Mauss, Department of Psychology, University of Denver, Colorado; James J. Gross, Psychology Department, Stanford University, California.

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Correspondence concerning this article should be addressed to Matthias Siemer, Department of Psychology, University of Miami, Coral Gables, FL 33124. E-mail: msiemer@psy.miami.edu

First, most existing studies confound different appraisals with different situations, making it impossible to decide whether appraisals alone are sufficient to produce different emotions in response to the same situation. For example, in the majority of studies on the appraisal-emotion link participants recall (autobiographical memory studies: Reisenzein & Hofmann, 1993; Reisenzein & Spielhofer, 1994) or imagine (hypothetical scenarios: Ellsworth & Smith, 1988; C. A. Smith & Lazarus, 1993) events that are associated with particular emotions, and judge these events along a number of appraisal dimensions. As a result, in autobiographical memory studies different appraisal profiles for different emotions are confounded with different recalled events. Studies that use hypothetical scenarios typically change situation descriptions between emotion conditions. Thus, in such studies, situations are also not identical across emotion conditions. A strict test of the sufficiency hypothesis requires showing that different appraisals of the exact same situation cause different emotional reactions.

The second limitation of many previous studies is that they did not assess actual emotional reactions but rather descriptions of hypothetical emotional reactions. This limits the validity of the results, given the people's limited ability to predict their emotional reactions (Gilbert & Ebert, 2002), and memory biases on individuals' *descriptions* of emotional events (e.g., Fredrickson, 2000; Levine, Prohaska, Burgess, Rice, & Laulhere, 2001), as well as the gap between hypothetical emotional reactions, on the one hand, and real emotional reactions, on the other.

Appraisals as Necessary Causes of Emotion

The second version of the core appraisal hypothesis is that appraisals are necessary causes of emotions (*necessity hypothesis*). This translates into the prediction that if the same situation causes different emotional responses it follows that this situation was appraised differently. Thus, the necessity hypothesis does not allow for factors other than appraisals to determine different emotional reactions toward the same situation.

In the past, many authors have challenged the necessity hypothesis by arguing that emotions are sometimes caused by noncognitive causes such as pain or hunger, and that accordingly appraisals are not always necessary (Berkowitz & Harmon-Jones, 2004; Izard, 1993). However, prima facie noncognitive causes of emotions can be accounted for by appraisal theories by assuming that the purportedly noncognitive causes are mediated by appraisals (Clore & Centerbar, 2004; Roseman, 2004; C. A. Smith & Kirby, 2004). For example, although some authors claim that physical discomfort or pain directly elicits anger (Berkowitz & Harmon-Jones, 2004), appraisal theorists assume that physical discomfort elicits anger only inasmuch as it triggers appraisals of motivational relevance or incongruence and other agency (C. A. Smith & Kirby, 2004) or displeasure or disapproval and other-agency (Clore & Centerbar, 2004). Of course, assumptions about the causal chain of events that ultimately lead to an emotion are notoriously difficult to test. Thus, it is unlikely that the necessity dispute will be empirically settled via this route.

By contrast, the prediction that if a person responds to the same situation with a different emotion than some other person, then he or she must have appraised the situation differently, provides a much stronger test of the necessity hypothesis. Again, the question of whether—within groups of individuals—different emotional response profiles are associated with different appraisal profiles has not been sufficiently explored in previous research. The majority of previous appraisal studies focused only on the predictability of single emotions by appraisal profiles across participants (e.g., Ellsworth & Scherer, 2003; Roseman & Smith, 2001).

Goals of the Present Study

The primary goal of the present study was to test the core assumption of appraisal theories of emotion, namely that the same situation evokes different emotional responses according to how it is appraised. In particular, we tested two predictions based on differing specifications of this core assumption: (1) The hypothesis that appraisals are sufficient causes of emotions predicts that if a person has a specific configuration of appraisals he or she will have a specific emotional response. Thus, different emotional reactions should be predictable by different appraisal patterns of the situation across participants. (2) The necessity hypothesis predicts that if a person shows a specific emotional response, this response has been caused by (and requires) a specific appraisal pattern. Thus, to test the necessity hypothesis, we examined whether different emotional response profiles were associated with distinct appraisal patterns.

Method

Participants

There were 122 female students (mean age = 22.8) who participated in a laboratory emotion induction involving negative feedback. To minimize variance because of known gender differences in the emotions the induction was thought to induce (Fischer, Rodriguez Mosquera, van Vianen, & Manstead, 2004), only female participants were used. The ethnic composition of the sample was mixed: 3% African American, 21% Asian American, 48% Caucasian, 10% Latino, and 9% other.

Procedure and Dependent Measures

As part of a larger study, participants were recruited for a 1-hour study on mood and cognitive performance. Upon arrival at the lab, physiological sensors were attached by a female research assistant (psychophysiological data are not reported here). The participant then viewed an emotionally neutral 5-minute nature film. At the end of the film, the participant rated her current emotion experience. Once she was finished, the experimenter entered the room to introduce herself. The experimenter was brusque with all participants, making little eye contact and speaking to them in a condescending manner. The experimenter informed the participant that she would be participating in a cognitive performance task, and that the two of them would be communicating through an intercom system. The experimenter then left the room for the remainder of the experiment.

At this point, the emotion induction procedure began, which was adapted from Stemmler (1997). Participants were asked to count backward quickly in increments of 7 or 13 from a very high number (e.g., "Count backward in steps of 7 from 18,652") for 1 minute. This task was repeated three times. In between each counting task, the experimenter, ostensibly unhappy with the par-

Table 1
Means and Standard Deviations of Emotion-Ratings Before and After Emotion Induction

	Time							
	Before induction		After induction					
Emotion	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*	*d*[a]
Anger	.49	1.12	2.04	2.19	7.31	107	<.001	1.38
Guilt	.51	1.13	2.01	2.58	6.42	107	<.001	1.33
Shame	.55	1.31	2.87	2.9	8.32	107	<.001	1.77
Sadness	.89	1.46	1.52	1.52	3.27	107	.001	.43
Amusement	3.91	2.56	2.41	2.46	−5.88	107	<.001	−.59
Pleasure	4.04	2.43	1.78	1.8	−9.14	107	<.001	−.93

[a] Mean difference standardized by *SD* before induction.

ticipants' performance, repeatedly gave negative feedback to the participants, telling the participants that they were moving too often, producing physiological artifacts and rendering the data useless, and that they were not speaking sufficiently loudly. These comments were increasingly critical and given in an increasingly annoyed tone of voice. After three tasks, the experimenter informed the participant that she would have to return to the task later on, implying that the attempts had been useless.

The induction condition therefore exposed the participants to a stressful task that included negative (social) feedback and that was ambiguous insofar as participants had no objective standard to judge whether the negative feedback was accurate and appropriate or not. Importantly, instructions and feedback were standardized, and were independent of actual performance. In particular, all questions and directions played over the intercom to the participant were prerecorded in the experimenter's voice. We expected this standardized situation to be sufficiently ambiguous to induce a variety of different emotional responses (such as shame, guilt, and anger), including mixed emotions. Moreover, because the current emotion induction procedure was inherently ambiguous, it was expected to be an excellent tool to capture variation in emotional responding because of participants' habitual appraisals.

The emotion induction was followed by emotion ratings. Six emotions that were expected to be induced by the situation were measured with the items "guilty," "shameful," "sad," "angry," "amused," and "pleased" on an 11-point scale ranging from 0 (*none at all*) to 10 (*extremely*).[1] Next, participants completed an appraisal questionnaire containing five fundamental appraisal dimensions that are postulated in a variety of appraisal theories (e.g., Ellsworth & Scherer, 2003; Frijda, 1987; Lazarus, 1991; Ortony et al., 1988; Roseman, 1991; Scherer, 1999; C. A. Smith & Lazarus, 1993): controllability ("I felt in control of what happened during the previous task."), self-importance ("The previous task was important to me."), unexpectedness ("What happened during the previous task was unexpected."), other-responsibility ("What happened during the task was the responsibility of the experimenter."), and self-responsibility ("I could have changed the way the previous task went.").[2] These appraisals were specifically chosen because they were assumed to best separate between likely emotional reactions to the emotion induction, without making participants aware of the manipulation. Appraisals were measured on an 11-point scale ranging from 0 (*strongly disagree*) to 10 (*strongly agree*).

Results

We first examined whether the experimental emotion induction affected a range of different emotions. Table 1 shows that this was indeed the case. The experimental treatment significantly elevated the emotions of guilt, shame, anger, and sadness whereas it significantly decreased the emotions of amusement and pleasure. The average absolute effect size of changes across the six emotions was $d = 1.07$, which is well above an effect size conventionally considered as large ($d = .8$, cf., Cohen, 1992).

Are Appraisals Sufficient for Emotion?

The hypothesis that appraisals are sufficient causes of emotions predicts that if a person has a specific configuration of appraisals he or she will have a specific emotional response. Therefore, appraisals (absent any other information about other emotion-related variables) should allow one to predict the emotional response a person shows. Consequently, to test the sufficiency hypothesis, we examined whether different appraisal patterns statistically predicted emotional responses across persons. In contrast, if appraisals are not sufficient causes of emotions, participants could have reported the same appraisal patterns without experiencing these emotions.

Table 2 shows the correlations between separate appraisal dimensions and each emotion. Overall, it is remarkable that no pair of emotions shows an identical pattern of significant correlations across all appraisal dimensions—a pattern that supports the assumption that appraisal profiles indeed distinguish between different emotions. Moreover, looking at the correlations in more detail, we find that the emotion—appraisal relations are largely consistent with the predictions of various appraisal theories.

Unexpectedness was associated with all negative emotions, indicating that unexpectedness is a global intensity determinant of

[1] Participants also responded to a number of other state items, like "tense," "energetic" or "tired" that did not address specific emotions. Following existing research, we focused on the relation between appraisal and proper emotion terms.

[2] The primary goal of the present study was not to test a particular appraisal theory of emotions.

Table 2
Correlations Among Appraisal- and Emotion-Ratings

	Emotion					
Appraisal	Anger	Guilt	Shame	Sadness	Amusement	Pleasure
Unexpectedness	.228*	.307**	.343**	.280**		
Control		−.276**	−.309**	−.265**		.276**
Other-responsibility	.295**					
Self-responsibility				.305**	−.245*	
Self-importance		.284**	.275**			

* p (two-tailed) $< .05$. ** p (two-tailed) $< .01$.

negative emotions (Ortony et al., 1988). The degree of judged personal control over the situation was negatively associated with guilt, shame, and sadness (but not anger) and positively associated with the positive emotion of pleasure. The appraisal of other-responsibility (i.e., blaming the experimenter for the performance) was positively associated with anger (but not with any other negative emotion) and also (marginally) with pleasure and amusement. In contrast, the appraisal of self-responsibility was positively associated with sadness and (marginally) with shame whereas self-responsibility was negatively associated with amusement. Finally, the appraisal of self-importance was positively associated with shame and guilt.

Next, to identify the set of appraisals that best predicted individual emotions, we conducted multiple regression analyses for each emotion that predicted emotion intensity with the five appraisal dimensions (see Table 3). Overall, the set of five appraisal dimensions included in this study predicted between 13% (amusement) and 25% (shame and pleasure) of variation in emotion intensity. This compares favorably with findings in prior research.

Anger intensity was mainly predicted by the appraisal of other-responsibility and marginally significantly by unexpectedness. This is in line with the notion that the attribution of blame to another person is central for anger. Shame and guilt were both predicted by unexpectedness, low levels of experienced control, and high levels of self-importance of the event. Shame was also marginally significantly predicted by self-responsibility. Sadness was predicted by unexpectedness, low levels of control, and high levels of self-responsibility. In contrast to shame and guilt, self-importance did not predict sadness intensity. Amusement was predicted by other-responsibility (as was anger) and also by low levels of self-responsibility (unlike anger) and (marginally) by high levels of control. Intensity of pleasure was predicted by high levels of experienced control and (marginally) by other-responsibility (as anger) and self-importance (as guilt and shame). In summary, although each appraisal-dimension was involved in the prediction of more than one emotion, no emotion was predicted by the same subset of appraisal-dimensions. This finding suggests that individual emotions were associated with unique appraisal patterns.

Are Appraisals Necessary for Emotion?

The necessity hypothesis predicts that if a person shows a specific emotional response, this response has been caused by a specific appraisal pattern. Consequently, to test the necessity hypothesis, we examined whether different emotional response profiles were associated with distinct appraisal patterns. Thus, groups of participants with a similar emotional response profile should be associated with the same appraisal profile. In contrast, if appraisals are not necessary causes of emotions, similar emotional response profiles could be associated with different appraisal profiles.

In a first step, we used multivariate classification methods to identify groups of people who responded with similar emotion patterns to the same situation (Eid, 2001). In particular, to identify subgroups of participants with similar emotional response profiles, a hierarchical cluster analysis was performed with the emotion intensity responses that divided participants into separate groups

Table 3
Standardized Regression Weights and Explained Variance of Multiple Regressions Predicting Emotion-Ratings by Appraisal-Ratings

	Emotion					
Appraisal	Anger	Guilt	Shame	Sadness	Amusement	Pleasure
Control		−.21*	−.27**	−.24*		.28**
Self-importance		.27**	.27**			
Unexpectedness			.20*			
Other-responsibility	.27**				.23*	
Self-responsibility			.18*	.32**	−.28**	
R^2	.14**	.24***	.25***	.23***	.13*	.25**

* p (two-tailed) $< .05$. ** p (two-tailed) $< .01$. *** p (two-tailed) $< .001$.

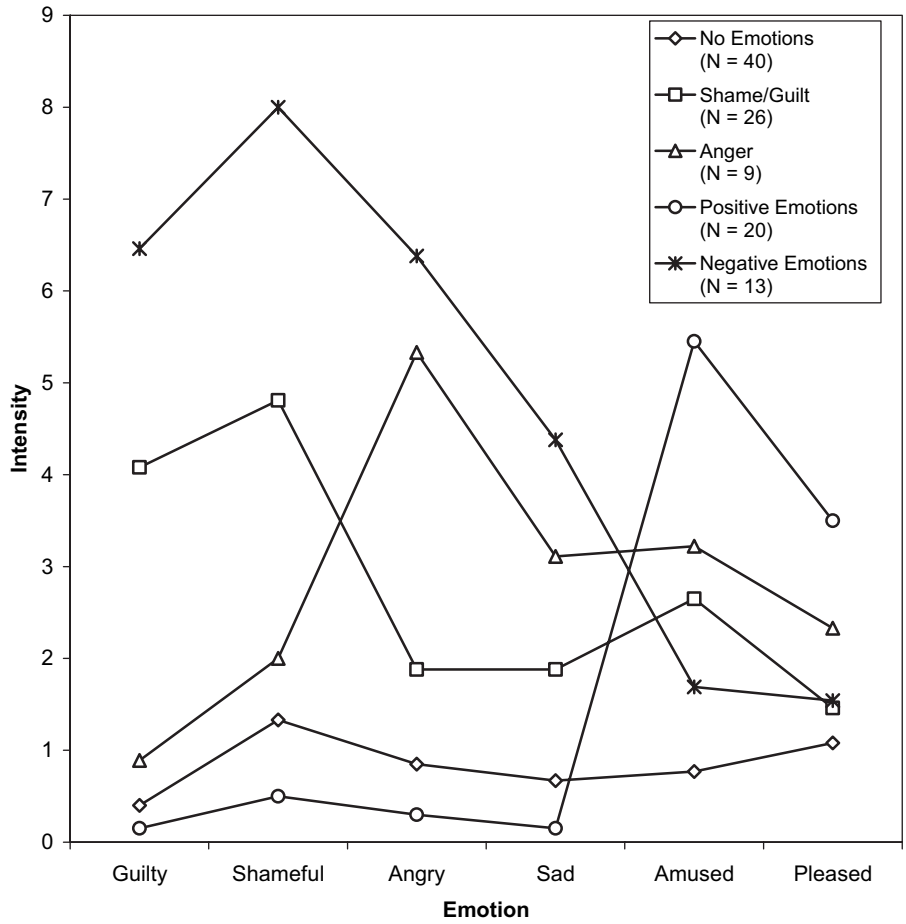

Figure 1. *N*s and means of the emotion-ratings in five clusters obtained by a ward hierarchical cluster analysis of the squared euclidean distance matrix of the emotion-ratings.

with similar emotional response profiles.[3] This analysis suggested a five-cluster solution. These five clusters explained substantial variation between the different emotions, ranging from $eta^2 = .22$ (pleasure) to $eta^2 = .77$ (guilt).

Figure 1 shows the emotion-intensity means of the resulting cluster. The first cluster consists of participants who did not experience any negative or positive emotions (*no emotions*). The second cluster consists of participants who primarily experienced shame and guilt (*shame-guilt*). Participants in the third cluster experienced primarily anger (*anger*). Participants in the fourth cluster did not experience any negative emotion but, unlike cluster one, maintained experience positive emotions (*positive emotions*). Finally, the fifth cluster consists of participants who experienced all four negative emotions with greater intensity than any of the other clusters, whereas experiencing low levels of positive emotions (*negative emotions*).

In a second step, we explored whether these different emotional response profiles were associated with different appraisal patterns. Figure 2 shows the appraisal profiles for the five clusters as mean-deviation scores. Descriptively, each emotional response profile is associated with a distinctive appraisal profile. The negative-cluster had the highest levels in self-importance, unexpectedness, and self-responsibility; the guilt-shame cluster had the lowest levels for experienced control over the situation; the anger-cluster had the highest degree of judged other-responsibility; the no-emotion cluster had the lowest levels for self-importance, unexpectedness, and other-responsibility ratings; and the positive-cluster had the highest levels of experienced control, combined with the lowest levels of self-responsibility.

To analyze how well appraisal profiles statistically discriminated between the different emotion response profiles a multinomial logistic regression analysis was conducted, with appraisals as predictors and participants' emotional profiles as dependent variables. Table 4 shows the results of this logistic regression analysis. The fit of the model to the data was excellent and appraisals allowed for correct classification of 48.1% of the participants into clusters of similar emotional response profiles.[4] Table 4 shows that all appraisals (at least with marginal significance) contributed to the discrimination between the emotional response profiles.

[3] The cluster analysis was computed with the euclidean distance matrix of the emotion intensity responses using Ward's linkage method (see Everitt, 1993 for details).

[4] A parametric discriminant analysis classified 43.5% of the cases correctly.

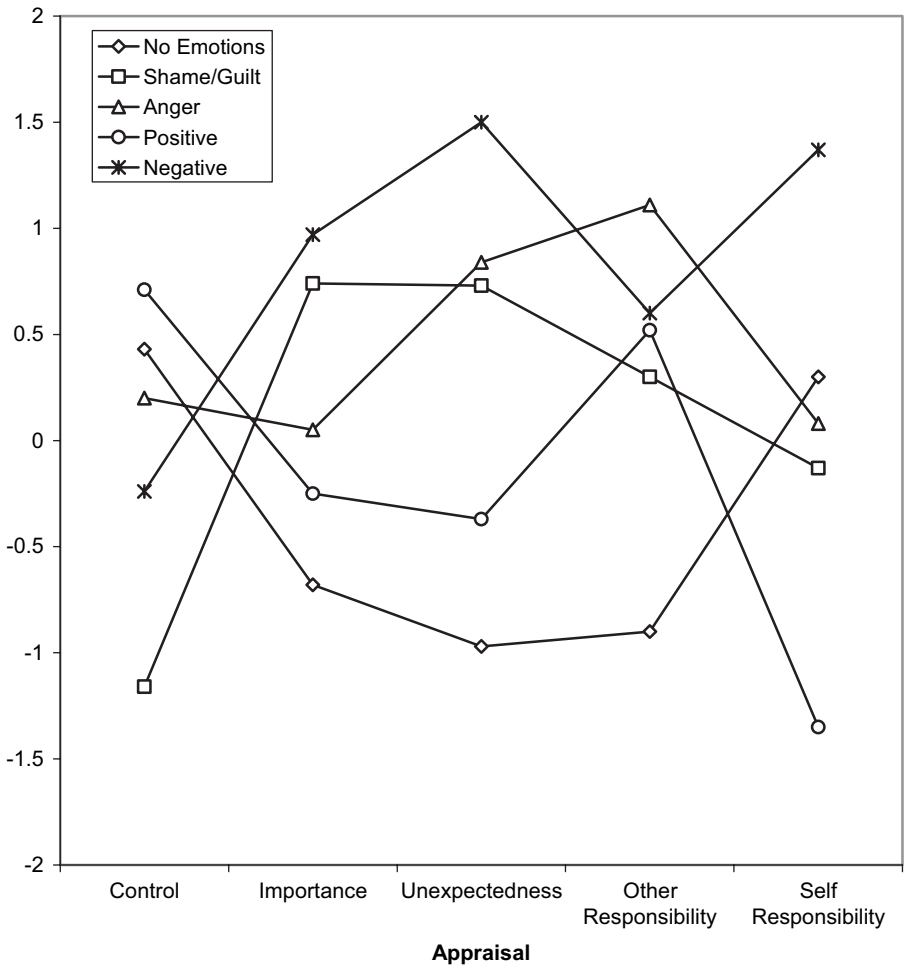

Figure 2. *N*s and means of the appraisal-rating mean-deviation scores in the five clusters obtained by a ward hierarchical cluster analysis of the squared euclidean distance matrix of the emotion-ratings.

Discussion

The goal of the present study was to empirically test the sufficiency and necessity versions of appraisal theories of emotion by examining participants' emotional reactions toward the same, somewhat ambiguous situation. As expected, participants responded to this situation with a wide variety of emotional responses. On average, they responded with increased shame, guilt, sadness, and anger and with decreased pleasure and amusement. Importantly, however, different people responded with different patterns of emotions. Our results showed that individual emotional reactions were determined by how people appraised the situation, thereby supporting a core assumption of cognitive appraisal theories of emotions: People respond with different emotions to the same situations depending on how they appraise the situation. The present study also tested two more specific versions of this assumption, namely, the sufficiency hypothesis and the necessity hypothesis.

Table 4
Results of Likelihood Ratio Tests for Predictors in a Multinomial Logistic Regression Predicting Subject-Cluster by Appraisal-Ratings

Appraisal	Likelihood-ratio (-2 log likelihood)	χ^2	*df*	*p*
Control	281.435	12.054	4	.017
Self-importance	277.558	8.177	4	.085
Unexpectedness	278.346	8.965	4	.062
Other-responsibility	280.379	10.998	4	.027
Self-responsibility	280.054	10.673	4	.030

Note. Model fit information: Likelihood ratio = 269.38, $\chi^2(20, N = 108) = 51.36$, $p < .001$; Cox and Snell pseudo $R^2 = .378$.

Sufficiency Hypothesis: Appraisals Determine Different Emotional Reactions to the Same Situation

The sufficiency hypothesis predicted that if a person has a specific configuration of appraisal he or she would have a specific emotional response. In accord with this prediction, our correlational and regression analyses showed that each emotion was

associated with a distinct pattern of appraisals. For example, anger was mainly associated with the attribution of responsibility to another person. Sadness was associated with a sense of lack of control over the situation whereas considering oneself responsible for what had happened. Shame and guilt were also associated with a sense of lack of control and additionally with interpreting the situation as being important to oneself. The emotion of pleasure was mainly associated with the impression that one had control over the situation whereas amusement was mainly associated with a sense of not being responsible for the situation. Although the goal of the present study was not to test any particular appraisal-theory of emotions, it is safe to say that these differential associations are generally consistent with a variety of appraisal theories (e.g., Ortony et al., 1988; Roseman & Smith, 2001; Scherer, 2001; C. A. Smith & Lazarus, 1993). In summary, across all participants, distinct emotions were differentially associated with and predictable by different appraisal patterns. This pattern of results supports the assumption that different appraisal patterns of the same situation are sufficient to cause different emotional reactions.

Necessity Hypothesis: Different Emotional Reactions Require Different Appraisals

We also tested the hypothesis that for the same situation to elicit different emotions it is necessary that this situation be appraised differently. As outlined above this hypothesis implies that different individual emotional response profiles require distinct appraisal patterns. The corresponding analysis revealed that different groups of participants responded with widely diverse emotional response profiles to the same event. Some participants responded with relatively specific, but different, negative emotional reactions, specifically with shame-guilt versus anger. Some participants responded with emotional resilience to the event, that is, by maintaining relatively high levels of positive emotions whereas having no negative emotional responses. Some participants responded with a sort of emotional numbness and did not report experiencing any emotions at all. Finally, some participants responded with a mixture of intense negative emotions, reporting high levels of guilt, shame, anger, and sadness.

Were these different emotional reactions toward the same event the result of different appraisals of this situation? The results imply an affirmative answer to this question. Specifically, the findings showed that the diverse emotional response profiles were predictable and largely determined by the reported appraisals of the situation. Appraisals predicted the correct emotional response profile of over 48% of the participants. Although the present study used only a limited set of appraisal dimensions, this degree of predictability of emotional response profiles is about the size of the predictability of the dominant emotional response as typically found in appraisal research (e.g., Frijda, Kuipers, & ter Schure, 1989; Reisenzein & Spielhofer, 1994; C. A. Smith & Ellsworth, 1985).

The appraisal profiles of the groups largely reflect the findings of the correlational approach. The shame-guilt cluster reported the lowest levels of control over the situation and high levels of self-importance. The anger cluster reported the highest levels of other-responsibility attribution. The positive emotion cluster reported the highest levels of control over the situation and by far the lowest levels of self-responsibility. The two remaining groups did not show any specific emotional responses. One of these two groups showed a sort of emotional numbness by reporting no emotions at all. Interestingly, this group reported the lowest levels of self-importance of the task and of unexpectedness of the outcome of the task. This profile indicates a high degree of indifference toward the task.

Appraisals and Emotion Regulation

Confirming evidence about the central role of cognitive appraisals in emotions comes from the growing emotion regulation literature (Gross, 2002). This literature convincingly shows that voluntary changes of the appraisals of a situation can efficiently influence the intensity of an emotional reaction (Gross, 1998; Ochsner, Bunge, Gross, & Gabrieli, 2002; Ochsner et al., 2004). This indicates that changing appraisals can be sufficient to influence the intensity of emotions, lending support to the sufficiency hypothesis. Moreover, it is noteworthy that noncognitive emotion regulation strategies, such as inhibition of emotion expressions, have been consistently found to be less efficient, if effective at all, to change the intensity of emotions (Gross, 1998; Gross & Levenson, 1997). This finding is consistent with a plausible extension of the necessity hypothesis: If appraisals are necessary for the generation of emotions, changes in appraisals may be necessary to change emotions (at least their quality, see the paragraph below).

It needs to be pointed out, however, that existing emotion regulation studies almost exclusively focused on the regulation of the *intensity* of emotions. By contrast, appraisal theories typically assume that appraisals not only influence the emotion-intensity but also determine the *quality* of an emotion (e.g., Ortony et al., 1988). Thus, showing that reappraisal cannot only change the intensity of an emotion but also its quality could substantially add to the contribution of emotion regulation research to appraisal theories.

Limitations and Future Directions

One limitation of the present study is that it had only female participants and included a limited number of appraisals and emotions. Future studies should include a broader range of participants and a broader range of appraisal dimensions and emotions. There are no a priori reasons, however, why the present results should not generalize to this broader universe.

A second limitation of the present study also needs to be addressed. Because our study focused on spontaneous, naturally occurring appraisals, the present study did not test the actual temporal sequence of appraisals and emotion generation (i.e., appraisals as preceding and leading to emotions). Yet, this is true for most, if not all, existing studies on appraisal theories of emotion (Reisenzein, 2001; Siemer & Reisenzein, 2007b). Tests of the real time sequence of appraisals and emotions are extremely difficult to accomplish as most involved processes are likely to occur very quickly and, according to common consensus, can be automatic and unconscious (Siemer & Reisenzein, 2007a, 2007b; C. A. Smith & Kirby, 2001; E. R. Smith & Neumann, 2005).

It needs to be emphasized, however, that the notion that appraisals are regularly unconscious does not necessarily limit the validity of self-reported appraisals. This is because even if the appraisal-*process* by which we arrive at appraisals of the situation is auto-

matic and unconscious this does not imply that the *results* of this process are also unconscious. Theoretical accounts of automatization typically assume that the results of automatic processes—as opposed to the processes themselves—are consciously accessible (Anderson, 1987; Logan, 1988). For example, we may be unaware how we inferred that another person is responsible but we are aware that we believe he is. Thus, it is reasonable to assume that self-reported appraisals are predictive of emotions even though the processes by which persons arrive at these appraisals are unconscious (for a more thorough discussion of this and related issues of appraisal theories see Parkinson, 2007; Siemer & Reisenzein, 2007a, 2007b).

Future studies should complement the present approach by experimentally manipulating appraisals of the same situation. An experimental approach could test whether the introduction of a specific appraisal (pattern) is sufficient to trigger an emotional response and whether the suppression of specific appraisals changes or eliminates a particular emotional response (as a test of the necessity claim). So far only a very limited number of studies have manipulated appraisals and measured actual emotional reactions (e.g., Neumann, 2000; Roseman & Evdokas, 2004) exist.

Conclusion

Appraisal theories of emotion hold that it is the way a person interprets a situation—rather than the situation itself—that gives rise to one emotion rather than another emotion. In the present study, participants responded to a standardized, yet ambiguous, laboratory situation with a variety of different emotions. Appraisals predicted emotional reactions emotions across participants, supporting the hypothesis that appraisals are sufficient causes of different emotional reactions toward a particular situation. In addition, subgroups of participants with similar emotional response profiles made comparable appraisals, giving support to the notion that appraisals are necessary causes of different emotions. In summary, the results support a fundamental assumption of appraisal theories of emotions that has been subjected to surprisingly few empirical tests in the past.

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