

Appraisals of Emotion-Eliciting Events: Testing a Theory of Discrete Emotions

Ira J. Roseman and Martin S. Spindel
New School for Social Research

Paul E. Jose
Loyola University of Chicago

A recent theory (Roseman, 1979, 1984) attempts to specify the particular appraisals of events that elicit 16 discrete emotions. This study tested hypotheses from the latest version of the theory and compared them with hypotheses derived from appraisal theories proposed by Arnold (1960) and by Scherer (1988), using procedures designed to address some prior methodological problems. Results provided empirical support for numerous hypotheses linking particular appraisals of situational state (motive-inconsistent/motive-consistent), motivational state (punishment/reward), probability (uncertain/certain), power (weak/strong), legitimacy (negative outcome deserved/positive outcome deserved), and agency (circumstances/other person/self) to particular emotions. Where hypotheses were not supported, new appraisal-emotion relationships that revise the theory were proposed.

Why do people feel particular discrete emotions, such as sadness, anger, or guilt? Why does a particular person in a particular situation (e.g., the breakup of a relationship) feel one of these emotions rather than another? Why do different people in the same situation, or the same person in a situation at different times, feel different emotions?

Appraisal theorists (e.g., Arnold, 1960; Frijda, 1986; Lazarus, 1968; Oatley & Johnson-Laird, 1987; Ortony, Clore, & Collins, 1988; Roseman, 1979, 1984; Scherer, 1984, 1988; Weiner, 1985) claim that evaluations and interpretations of events, rather than events per se, determine whether an emotion will be felt and which emotion it will be.¹ Two individuals will feel the same emotion to the extent that their appraisals of a situation are the same. Two individuals with different appraisals, or the same individual with different appraisals at different times, will feel different emotions. Thus, by identifying emotion-causing patterns of appraisal, such theories may be able to explain how an infinite variety of situations can elicit the same emotion and may also be able to explain the apparent variability across people and over time in emotional responses to the same event. The challenge for appraisal theorists is to specify the patterns of appraisal that can produce particular emotions.

In the present generation of appraisal theories, Roseman

(1979) proposed that five appraisals influence emotions: (a) *motivational state*: whether an individual's motive in a given situation is aversive (a punishment that he or she seeks to avoid) or appetitive (a reward that he or she seeks to attain), (b) *situational state*: whether the motivational state (the punishment or reward) is present or absent in the situation to which the individual is reacting, (c) *probability*: whether the occurrence of an outcome is uncertain or certain, (d) *legitimacy*: whether a negative outcome is deserved or a positive outcome is deserved in the situation, and (e) *agency*: whether an outcome is caused by impersonal circumstances, some other person, or the self.

Roseman (1979) claimed that different combinations of these appraisals would elicit different emotions. In Figure 1, the appraisal alternatives are shown along the borders of the chart, and the emotions elicited by each combination are given in the boxes. For example, according to the theory, sadness (sorrow) results from an absence of reward that is certain and caused by impersonal circumstances when a negative outcome is deserved. In contrast, anger results from the absence of a reward or presence of a punishment that is caused by other people when a positive outcome is deserved.

In testing this theory, Roseman (1983) found that each of the five appraisals had a significant effect on emotion ratings and that the overall pattern of relationships between particular combinations of appraisals and particular emotions corresponded significantly to theoretical predictions. Post hoc analyses suggested that the effects of the motivational state and situational state appraisals (interacting to determine whether an outcome was appraised as negative vs. positive), and of probability, con-

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Correspondence concerning this article should be addressed to Ira J. Roseman, Department of Psychology, The Graduate Faculty, New School for Social Research, 65 Fifth Avenue, New York, New York 10003.

¹ A number of other investigators (e.g., Averill, 1982; de Rivera, 1977; Shaver, Schwartz, Kirson, & O'Connor, 1987; Smith & Ellsworth, 1985) have related patterns of appraisal to particular emotions, without necessarily claiming that the appraisals cause the emotions.

	Present Reward	Absent Punishment	Absent Reward	Present Punishment	
Circumstance-Caused	Hope		Fear		Deserve Negative
	Joy	Relief	Sorrow	Distress	
Uncertain	Hope		Frustration		Deserve Positive
	Joy	Relief			
Other-Caused	Liking		Dislike		Deserve Negative
			Anger		Deserve Positive
	Guilt		Regret		Deserve Positive

Figure 1. Appraisal patterns hypothesized to elicit particular emotions according to Roseman (1979).

formed more closely to predictions than the effects of legitimacy and agency.

Smith and Ellsworth (1985, 1987) and Ellsworth and Smith (1988a, 1988b) have tested an appraisal model they generated on the basis of a review of the literature on dimensions of emotional experience, integrated with the theories of Roseman (1979) and Scherer (1982). They have consistently found evidence (see also Tesser, 1990) for five appraisal dimensions: (a) *pleasantness*: whether an experience is unpleasant or pleasant, (b) *certainty*: whether a situation involves uncertainty or certainty about what is happening, (c) *self/other-agency*: whether events are controlled by the self or another person, (d) *attentional activity*: whether a person is trying to devote attention to a stimulus or divert attention from it, and (e) *anticipated effort*: the amount of effort seen as needed to deal with a situation. Various additional appraisals—including perceived obstacle, legitimacy, and situational control (*agency*)—sometimes do and sometimes do not differentiate among emotions.

Frijda and colleagues (Frijda, 1987; Frijda, Kuipers, & ter Schure, 1989) have studied appraisals proposed by a number of theorists. Comparing the authors' conclusions across these two investigations, relatively strong support was seen in both studies for appraisals of (a) *valence*: whether an event is unpleasant or pleasant, (b) *certainty*: whether the outcome of an event is uncertain or certain, (c) *agency*: whether the self or someone else is responsible for the occurrence of an event, (d) *interestingness*: whether an event is neutral or interesting, and (e) *globality*: whether an event can be localized in space. An additional appraisal of impact or importance distinguishes emotions (higher impact) from moods.

Roseman (1984) presented a revised theory that includes ap-

praisals found consistently (across investigators) to differentiate among emotions (see Figure 2). These are the following:

1. *Situational state*, reformulated into a dimension assessing whether events are inconsistent or consistent with a person's motives. This dimension is analogous to Smith and Ellsworth's pleasantness and Frijda's valence (cf. Lazarus & Smith, 1988, "motivational congruence"). As shown in Figure 2, appraising an event as motive-consistent produces a positive emotion; appraising an event as motive-inconsistent produces a negative emotion.

2. *Probability* (Roseman, 1979), identical to Smith and Ellsworth's probability or certainty and Frijda's uncertainty or certainty: Uncertain outcomes lead to hope or fear; certain outcomes lead to emotions such as joy or sadness.

3. *Agency* (Roseman, 1979), analogous to Smith and Ellsworth's self/other agency or self/other responsibility-control and Frijda's agency or responsibility (cf. "locus" in Weiner, 1985): Cause by circumstances beyond anyone's control leads to emotions such as sadness; cause by some other person leads to emotions such as anger; cause by the self leads to emotions such as guilt.

Roseman's (1984) revised theory also includes the following:

4. *Motivational state* (Roseman, 1979), an appraisal not tested by Smith and Ellsworth or by Frijda and his colleagues: As shown in Figure 2, events consistent with a motive to obtain reward (*appetitive* motivation) elicit joy; events consistent with a motive to avoid punishment (*aversive* motivation) elicit relief; events inconsistent with a motive to obtain reward elicit sadness; events inconsistent with a motive to avoid punishment elicit distress.

5. *Power*, as a possible replacement for the legitimacy ap-

Circumstance-Caused	Positive Emotions		Negative Emotions		
	Motive-Consistent Appetitive	Aversive	Motive-Inconsistent Appetitive	Aversive	
Unknown	Surprise				
Uncertain	Hope		Fear		Weak
Certain	Joy	Relief	Sadness	Distress, Disgust	
Uncertain	Hope		Frustration		Strong
Certain	Joy	Relief			
Other-Caused	Liking		Dislike		Weak
Uncertain			Anger		Strong
Certain					
Uncertain					
Certain	Pride		Shame, Guilt		Weak
Self-Caused			Regret		Strong
Uncertain					
Certain					

Figure 2. Appraisal patterns hypothesized to elicit particular emotions according to Roseman (1984). From "Cognitive Determinants of Emotions: A Structural Theory" by Ira J. Roseman, 1984. In P. Shaver (Ed.), *Review of Personality and Social Psychology* (Vol. 5, p. 31). Beverly Hills, CA: Sage. Copyright 1984 by Sage Publications, Inc. Reprinted by permission.

praisal (cf. "potency" in Osgood, Suci, & Tannenbaum, 1957; Osgood, May, & Miron, 1975; "power" in Kemper, 1978; "dominance" in Russell, 1978; "coping potential" in Scherer, 1984; Lazarus & Smith, 1988; "controllability" in Seligman, 1975; Weiner, 1985). In the context of other appraisals, perceiving oneself as weak (rather than strong) leads to feeling sadness, distress, or fear, rather than frustration; dislike toward someone (unfriendliness) rather than anger; and guilt rather than regret.

Roseman (1984) also expanded his theory by providing hypotheses about three additional states often considered to be discrete emotions. Surprise was predicted to result from events appraised as so uncertain as to be unknown. Disgust, like distress, was predicted to result from events appraised as inconsistent with an aversive motive (i.e., involving the presence or increasing closeness of a noxious stimulus), certain, and caused by circumstances, with the self perceived as weak. Shame, like guilt, was hypothesized to result from events appraised as motive inconsistent and caused by the self, with oneself perceived as weak.

Objectives of the Present Study

Testing the Revised Version of Roseman's Theory

The present study was designed to test predictions of Roseman's (1984) revised and expanded theory. Does each of the

hypothesized appraisals distinguish among emotions? Does each appraisal differentiate among particular emotions as predicted?

Comparisons With Alternative Theories

Roseman's (1984) hypotheses about appraisal-emotion relationships can also be compared with predictions that are based on other theories. Where different theories make conflicting claims, which claims are supported?

In looking for alternative theories, we found that much research (e.g., Ellsworth & Smith, 1988a, 1988b; Frijda, 1987; Frijda et al., 1989; Smith & Ellsworth, 1985, 1987) has focused on identifying which appraisals have an impact on emotions. However, a few other theorists (e.g., Arnold, 1960; Scherer, 1988) also postulate relationships between particular appraisals and particular emotions (see also Ortony, Clore, & Collins, 1988; Weiner, 1985).

Magda Arnold's (1960) theory, although it was the first modern attempt to specify appraisal-emotion relationships, has never been given a careful empirical test. This may be because it was ahead of its time, appearing even before the Schachter and Singer (1962) experiment made the impact of cognition on emotion a legitimate topic of investigation, at the dawn of the cognitive revolution.

According to Arnold (1960), three appraisals determine the particular emotion that a person will experience: (a) whether an object is beneficial or harmful, (b) whether it is present or ab-

	Appraisal						Emotion					
	WANTING, DESIRE		DELIGHT, JOY		LOVE, LIKING		AVERSION, RECOIL		SORROW SADNESS		HATE, DISLIKE	
SUITABILITY	beneficial		beneficial		beneficial		harmful		harmful		harmful	
PRESENCE	absent		present		open		absent		present		open	
DEGREE OF DIFFICULTY IN ATTAINING OR REJECTING	easy ^a		easy		easy		easy		easy		easy	
	HOPE		DARING, COURAGE		ANGER		HOPELESSNESS, FEAR DESPAIR				DEJECTION	
SUITABILITY	beneficial		harmful		harmful		beneficial		harmful		harmful	
PRESENCE	absent		absent		present		absent		absent		present	
DEGREE OF DIFFICULTY IN ATTAINING OR REJECTING	difficult ^b		difficult ^c		difficult ^c		too difficult ^d		too difficult ^e		too difficult ^e	

Figure 3. Appraisal patterns hypothesized to elicit particular emotions according to Arnold (1960). (^a Easy = "conditions are favorable" for attaining or rejecting the object. ^b "if judged attainable." ^c "if to be overcome." ^d "if judged unattainable." ^e "if to be avoided.") Adapted from *Emotion and Personality* (Vol. 1, p. 196) by M. B. Arnold, 1960, New York: Columbia University Press. Copyright 1960 by Columbia University Press. Adapted by permission.

sent (not currently present), (c) whether it is easy, difficult, or too difficult to attain (in the case of beneficial objects) or overcome (in the case of harmful objects). Relationships between these appraisals and particular emotions are presented in Figure 3.

Comparing this with Roseman's (1984) theory, it may be seen that events appraised as harmful (in Arnold's terms) are those that are motive-inconsistent (according to Roseman), events that are not present (Arnold) are uncertain (Roseman), and events that are too difficult to attain or overcome (Arnold) indicate an agent who is weak (Roseman).

Klaus Scherer (e.g., 1982, 1984) also proposed a theory of the

appraisal antecedents of emotions. In a recent article, Scherer (1988) reviewed his theory and offered detailed predictions about appraisal-emotion relationships, taking the work of other theorists and researchers into account.

According to Scherer (1988), emotions result from a series of appraisals, termed *stimulus evaluation checks*, some of which consist of *subchecks*. The appraisals are the following:

1. *Novelty*: whether a stimulus event deviates from what is expected, consisting of subchecks for (a) the *suddenness* of onset of the event, (b) the degree of *familiarity* of the event, and (c) the *predictability* of the event.

2. *Intrinsic pleasantness*: the quality of a stimulus itself, from unpleasant to pleasant, independent of its relevance to motives or goals.

3. *Goal significance*: whether an event is relevant to an organism's goals or plans, consisting of subchecks for (a) *concern relevance*: whether an event is relevant to personal, relationship, or social order concerns, (b) *outcome probability*: the likelihood of an event's occurrence, (c) *expectation*: the inconsistency or consistency of an event with expectations, (d) *conduciveness*: the degree to which an event blocks or helps achieve an organism's goals, and (e) *urgency*: the perceived urgency of making an appropriate behavioral response to an event.

4. *Coping potential*: the ability of an individual to cope with an event, consisting of subchecks for (a) *agent*: whether the event is caused by nature, other persons, or the self; (b) *motive*: whether an agent's action is due to chance or negligence or is intentional; (c) *control*: the degree to which an event and its consequences are controllable; (d) *power*: the degree to which the person having the emotion is able to influence the occurrence of an event; and (e) *adjustment potential*: the degree to which an individual is able to cope by changing internal concerns and goals rather than external events.

5. *Compatibility with standards*: the degree to which an event is compatible with moral standards, consisting of subchecks for (a) *external standards*: compatibility with standards of one's social group and (b) *internal standards*: compatibility with one's own standards, such as those of one's self-concept or ego ideal.

Scherer's predictions, relating particular appraisals to particular emotion states, are presented in Figure 4.

According to Scherer (1988), his goal conduciveness subcheck corresponds to Roseman's (1984) situational state appraisal; his outcome probability subcheck corresponds to Roseman's probability appraisal; his causal agent subcheck corresponds to Roseman's agency appraisal; and his power subcheck corresponds to Roseman's power appraisal. Scherer also relates his concern relevance subcheck to Roseman's motivational state appraisal, because they both distinguish types of motivations. But because the particular motives specified are different, we believe that these appraisals are not strictly comparable. Finally, Scherer's internal standards subcheck corresponds to Roseman's (1979) legitimacy appraisal.²

The specification of corresponding appraisals and emotions in the theories of Roseman (1979, 1984), Arnold (1960), and Scherer (1988) enables us to identify both common and divergent predictions concerning particular appraisal-emotion relationships and attempt to empirically resolve conflicting claims. For example, Roseman (1984) claims that motive-inconsistent events elicit guilt, but Scherer (1988) contends that goal-conducive events will lead to guilt. What do empirical observations show?

Addressing Prior Methodological Problems

The present study was also designed to address two methodological problems with prior research on appraisals as determinants of emotional responses.

The first problem is that some studies of appraisal-emotion relationships gather data on causes of hypothetical or typical emotional events, rather than actual emotion experiences.

For example, Roseman (1983) studied appraisal-emotion re-

lationships by presenting subjects with brief stories about events that happened to various protagonists. Different versions of each story systematically manipulated appraisals, and subjects rated how intensely various emotions were experienced by protagonists. However, in this paradigm, subjects inferred emotional responses. If the same events had happened to the subjects, their actual emotional responses might have been quite different. Frijda (1987) asked subjects to indicate whether particular appraisals were usually among the conditions leading to particular emotions. In this case, responses may have reflected subjects' theories of the causes of particular emotions, rather than appraisal-emotion relationships observable in real emotion experiences.

The present study addressed this problem by asking subjects about actual emotion experiences (as in Ellsworth & Smith, 1988a, 1988b; Smith & Ellsworth, 1985, 1987), rather than hypothetical or typical emotion experiences.

The second problem is that some studies of appraisal-emotion relationships have investigated appraisals made while feeling an emotion rather than appraisals that are causes of emotions. For example, Smith and Ellsworth's studies instructed subjects to report appraisals made while "actually experiencing the emotion, not what it was like either just before or just after the emotional experience" (Smith & Ellsworth, 1985, p. 820). Such instructions focus subjects on what they thought once they had begun feeling an emotion, rather than the appraisals that led them to feel the emotion in the first place.

The problem is significant because one's thoughts during an emotion experience may be quite different from the thoughts that caused the emotion. For example, one may try to divert attention from a stimulus during an experience of disgust (Smith & Ellsworth, 1985), even if it was paying attention to the stimulus that caused disgust. One may anticipate a high expenditure of effort during an experience of shame (Smith & Ellsworth, 1985)—for example, to restore a positive self-presentation—even if high anticipated effort was not a cause of shame. Asking subjects about appraisals made while actually experiencing emotions may be more appropriate for studying the components or correlates of emotions rather than their antecedents.

In the present study, we sought to address this problem by asking subjects about appraisals of events that caused emotions, rather than appraisals occurring during emotion experiences.

Method

Experimental Overview and Design

Appraisals hypothesized to lead to 16 different emotions were investigated in this study. Each subject was given a written questionnaire covering 2 of the emotions. For each emotion, subjects were asked to recall a time when they had experienced the emotion and to rate the event that caused their emotion on measures of the hypothesized appraisals.

² Scherer (1988) identifies his external standards subcheck with the legitimacy appraisal studied by Smith and Ellsworth (1985). However, in Roseman's (1979) theory, legitimacy is defined in terms of an individual's personal standards of deservingness (which may agree or disagree with social norms). Thus we align legitimacy here with Scherer's internal standards subcheck.

Appraisal	Emotion						
	ENJ/HAP	ELA/JOY	DISP/DISG	CON/SCO	SAD/DEJ	DESPAIR	ANX/WOR
NOVELTY							
- Suddenness	low	hi/med	open	open	low	high	low
- Familiarity	open	open	low	open	low	v low	open
- Predictability	medium	low	low	open	open	low	open
INTRINSIC PLEASANTNESS	high	open	v low	open	open	open	open
GOAL SIGNIFICANCE							
- Concern Relevance	open	self/rela	body	rela/order	open	open	body/self
- Outcome Probability	v high	v high	v high	high	v high	v high	medium
- Expectation	consonant	open	open	open	open	dissonant	open
- Conduciveness	conductive	v con	open	open	obstruct	obstruct	obstruct
- Urgency	v low	low	medium	low	low	high	medium
COPING POTENTIAL							
- Cause: Agent	open	open	open	other	open	oth/nat	oth/nat
- Cause: Motive	intent	cha/int	open	intent	cha/neg	cha/neg	open
- Control	open	open	open	high	v low	v low	open
- Power	open	open	open	low	v low	v low	low
- Adjustment	high	medium	open	high	medium	v low	medium
COMPATIBILITY STANDARDS							
- External	open	open	open	v low	open	open	open
- Internal	open	open	open	v low	open	open	open
	FEAR	IRR/COA	RAGE/HOA	BOR/IND	SHAME	GUILT	PRIDE
NOVELTY							
- Suddenness	high	low	high	v low	low	open	open
- Familiarity	open	open	low	high	open	open	open
- Predictability	low	medium	low	v high	open	open	open
INTRINSIC PLEASANTNESS	low	open	open	open	open	open	open
GOAL SIGNIFICANCE							
- Concern Relevance	body	order	order	body	self	rela/order	self
- Outcome Probability	high	v high	v high	v high	v high	v high	v high
- Expectation	dissonant	open	dissonant	consonant	open	open	open
- Conduciveness	obstruct	obstruct	obstruct	open	open	high	high
- Urgency	v high	medium	high	low	high	medium	low
COPING POTENTIAL							
- Cause: Agent	oth/nat	open	other	open	self	self	self
- Cause: Motive	open	int/neg	intent	open	int/neg	intent	intent
- Control	open	high	high	medium	open	open	open
- Power	v low	medium	high	medium	open	open	open
- Adjustment	low	high	high	high	medium	medium	high
COMPATIBILITY STANDARDS							
- External	open	low	low	open	open	v low	high
- Internal	open	low	low	open	v low	v low	v high

Figure 4. Appraisal patterns hypothesized to elicit particular emotions according to Scherer (1988). (ENJ/HAP = enjoyment/happiness; ELA/JOY = elation/joy; DISP/DISG = displeasure/disgust; CON/SCO = contempt/scorn; SAD/DEJ = sadness/dejection; ANX/WOR = anxiety/worry; IRR/COA = irritation/cold anger; RAGE/HOA = rage/hot anger; BOR/IND = boredom/indifference; hi = high; v = very; med = medium; rela = relationships; oth = other; nat = nature; int = intent; cha = chance; neg = negligence.) From "Criteria for Emotion-Antecedent Appraisal: A Review" by K. R. Scherer, 1988. In V. Hamilton, G. H. Bower, & N. H. Frijda (Eds.), *Cognitive Perspectives on Emotion and Motivation* (p. 112). Norwell, MA: Kluwer Academic Publishers. Copyright 1988 by Kluwer Academic Publishers. Reprinted by permission.

Subjects

Subjects were 36 male and 125 female students enrolled in classes at Loyola University of Chicago (96 undergraduates), the New School for Social Research (41 continuing education students and 14 psychology graduate students), New York University (2 continuing education students), and the College of New Rochelle (8 undergraduates). They ranged in age from 18 to 79, with a median age of 20. Loyola subjects chose to participate as one of several alternatives for fulfilling a course requirement. New School graduate students and College of New Rochelle students participated at the request of course instructors. The remaining subjects were unpaid volunteers who responded to in-class announcements soliciting participants for a study on reactions to emotional life experiences.

Stimulus Emotions

To obtain data on differences in appraisal between specific discrete emotions, rather than on gross differences between positive and negative emotion groups, each subject was asked to recall either 2 positive emotions or 2 negative emotions. The 16 emotions studied were therefore grouped into 8 pairs: joy/relief, affection/pride, hope/surprise, disgust/distress, sadness/fear, unfriendliness/anger, frustration/shame, and regret/guilt. Each subject was assigned at random to be asked about 1 of these pairs. Within a pair, the order of emotions was counterbalanced across subjects. Thus each emotion was recalled approximately half the time as the first experience on the questionnaire and half the time as the second experience.

Procedure

The questionnaire was administered to groups of subjects in classroom settings; an experimenter was present to assist individual subjects as necessary. Questionnaires had two parts, each of which asked about one emotion experience. The questions and order of questions in both parts were identical, except for the name of the recalled emotion.

Instructions for each portion of the questionnaire directed subjects to remember and write about a situation in which they felt a particular emotion. For example, subjects asked to recall an experience of sadness were told to "take a few minutes to remember a time when you felt SADNESS. Then tell the story of what happened on that occasion." Subjects were asked to write out the story to enhance recall of the experience (cf. Ellsworth & Smith, 1988a, 1988b; Smith & Ellsworth, 1985). Subjects were then asked to identify the specific emotion-eliciting event: "What was it in the situation you just described that directly caused you to feel sadness?" This specification was requested because pilot testing indicated that some emotional experiences involved multiple events, appraisals, and emotions. For this reason, it was necessary to focus subjects on appraisals of the specific portion of the experience that had led to a given emotion. After they identified the eliciting event, subjects were informed that subsequent appraisal questions would refer to it as Specific Event A (or Specific Event B for the second emotion-eliciting event recalled).

Subjects were next instructed to rate how intensely they felt each of the 16 emotions in our study when the eliciting event occurred. Each emotion was rated along a 9-point scale ranging from *not at all* (1) to *very intensely* (9). Subjects were then asked 44 questions measuring appraisals of the emotion-eliciting event. Emotion and appraisal ratings for the second emotion experience were followed by 11 demographic information questions.

Questionnaire completion time ranged from 25 to 90 min and averaged about 45 min. Subjects tended to describe experiences of significant emotional impact and importance in their lives—such as the birth

of a child, recovery from a serious illness, a relative's suicide, conflict with schoolmates or co-workers, or the dissolution of friendships or romantic relationships. The experiences often filled a page or more. For example, Subject 38 recalled the following experience of sadness:

My boyfriend and I just broke up about 2 weeks ago and I had a very hard time coping with the situation. After going out for a little over a year, you get attached to that person. Trying to hold back the tears, we discussed how we felt and decided that it was for the best. At that point, my heart sank. Never before had I felt this way. We ended the relationship great—because we both intend to be great friends and we respect each other. The first couple of days afterwards, I had a hard time concentrating on things—I focused most of my free time and thoughts on memories of how "we use[d] to be."

Subject 96 recalled an experience in which she felt anger:

The first thought that comes to mind is the time my boyfriend broke up with me. It was my first year in college and he was still a senior in high school. He broke up with me because it was too hard to date each other on a one-to-one basis. Actually, he still wanted to date me, but he wanted to see other girls also. After getting over the initial shock and hurt, I became *very* angry. I felt he had absolutely no right to put me through what he did. Every time I saw him after that I became furious with everything he did. I said many hurtful things about him. It took me about 2 to 3 months to get over the anger phase of the breakup.

Subject 127 remembered this experience of feeling guilt:

As a high school youngster, I was homework monitor for my row in one of my classes. One friend who sat behind me had some very interesting paper (onion-skin)—a kind that I had never seen before. She offered to give me some if I would indicate that she had done her homework. I very much wanted the paper and agreed to lie about her homework. However, I felt so guilty that I refused to accept the reward for my dishonesty.

This is the first (and only one I can think of right now) incident I can remember. The fact that I still remember indicates the depth of my feeling of guilt.

Appraisal Ratings

In the present article, we focus on appraisals of motivational state, situational state, probability, power, legitimacy, and agency. To minimize question-wording effects and to improve appraisal measurement, we formulated three items to measure each appraisal. These were distributed in random order in the appraisal pages of the questionnaire. Appraisal questions were answered on 9-point scales, anchored appropriately at either end. The questions and response scales measuring each appraisal are shown in the Appendix.

Results

Overview

We began our data analysis by calculating appraisal scores for each emotion experience. Then three sets of analyses were performed to determine (a) whether there were any differences in appraisal of events that elicited different emotions, (b) if so, whether each of the hypothesized appraisals differentiated among emotions, and (c) whether the appraisals differed among emotions in theoretically specified patterns.

Calculation of Appraisal Scores

Scores for situational state, motivational state, probability, power, and legitimacy were derived by averaging a subject's ratings on the questions designed to measure each of these appraisals (see Appendix). As noted in the Appendix, the question asking whether a subject perceived the event as an injustice was excluded from the legitimacy index because it was not highly correlated with other questions measuring this appraisal. Excluding this question increased the reliability of the legitimacy index from .39 to .63 (average alpha across all recalled emotion experiences). Alphas for the remaining indexes were .86 (situational state), .62 (motivational state), .56 (probability), and .74 (power). Because prior research (Roseman, 1983; Smith & Ellsworth, 1985) indicated that alternative attributions of the cause of an event are not mutually exclusive, appraisal ratings for circumstance-agency, other-person-agency, and self-agency were not combined.

Table 1 presents mean appraisal scores for each recalled emotion. Each appraisal is represented in the table by a pair of rows. The first row presents appraisal scores across emotions for experiences recalled in the first part of subjects' questionnaires (Experience 1). The second row presents appraisal scores across emotions for experiences recalled in the second part of subjects' questionnaires (Experience 2). Performing separate analyses of data from the first and second experiences allowed two tests of each theoretical prediction, providing information about the robustness of obtained effects.

Were There Differences in Appraisal of Events That Elicited Different Emotions?

To determine whether there were differences among emotions in appraisals of eliciting events, multivariate analyses of variance (MANOVAs) were performed on the theory-relevant appraisal measures for each experience. The predictor variable in these analyses was the emotion recalled; dependent variables were appraisal measures for situational state, motivational state, probability, power, legitimacy, circumstance-agency, other-person-agency, and self-agency. Results of the MANOVAs showed a highly significant main effect for emotion recalled, both in the first experience on the questionnaire, $F(120, 973) = 2.93$, $p < .001$, and in the second experience, $F(120, 959) = 2.91$, $p < .001$. Thus, appraisals of eliciting events clearly differed from emotion to emotion.

Did Each of the Hypothesized Appraisals Differentiate Among Emotions?

To examine which of the appraisals differed among emotions, separate univariate analyses were performed. Again, the predictor variable in these analyses was the emotion recalled. Each appraisal measure was the dependent variable in a separate analysis of variance (ANOVA). Results are shown in the Overall F column of Table 1. As shown in the table, appraisals of situational state, motivational state, power, circumstance-agency, other-person-agency, and self-agency differed significantly by emotion in both experiences; appraisals of probability differed significantly by emotion in Experience 2 and ap-

proached significance in Experience 1, $F(15, 145) = 1.53$, $p = .10$; and appraisals of legitimacy differed significantly by emotion in Experience 1 and approached significance in Experience 2, $F(15, 143) = 1.63$, $p = .07$.

Values of η^2 in Table 1 indicate the size of the main effect of emotion recalled on each measure of appraisal (see Rosenthal & Rosnow, 1985). The higher the value of η^2 , the more predictive power an appraisal has in differentiating among the emotions. As seen in Table 1, the appraisal of situational state (motive-inconsistent/motive-consistent) had the greatest impact, distinguishing negative from positive emotions. The appraisal of probability, hypothesized to distinguish only hope, fear, and surprise from other emotions, had the smallest impact.

Did the Appraisals Differ Among Emotions in Theoretically Specified Patterns?

To determine whether particular appraisals differentiated among emotions in the patterns predicted by Roseman's (1984) theory, single degree-of-freedom contrasts (see Rosenthal & Rosnow, 1985, pp. 1-18) were performed on the main effects of emotion recalled on each of the appraisals. Weights for a given contrast specified the predicted ordering of the means across emotions for a particular appraisal index, and a directional t test indicated whether the observed means conformed significantly to predictions. Contrast weights and significance tests for each appraisal are shown in Table 2.

As may be seen from the Contrast t columns of Table 2, across emotions, appraisals of situational state, motivational state, circumstance-agency, other-person-agency, and self-agency conformed significantly to Roseman's (1984) predictions in both experiences recalled by subjects. Appraisals of probability (Roseman, 1984) and legitimacy (Roseman, 1979) showed predicted differences in the first but not in the second recalled experience. Appraisals of power (Roseman, 1984) did not show predicted patterns in either experience.

Comparison of Predictions Made by Alternative Theories

As we did for Roseman's (1979, 1984) theory, we constructed single degree-of-freedom contrasts to test predictions made on the basis of Arnold's (1960) and Scherer's (1988) theories.³ We then compared the relative accuracy of predictions made according to each theory by examining values of η^2 , the effect size measure.

³ In most cases, construction of the contrasts was straightforward. However, difficult judgments were occasionally required, as in the case of motivational state predictions that were based on Scherer's (1988) theory. Because it was unclear (see Figure 4) whether *very conducive* (joy) meant more or less than *high conduciveness* (guilt, pride), we gave them equal weight in the contrast. Note also that though we specified corresponding appraisals across the theories (as discussed in the text), different theorists' conceptualizations of the corresponding appraisals are not always identical. Thus, our research does not test hypotheses regarding, say, presence (Arnold, 1960) or compatibility with internal standards (Scherer, 1988) but rather uses these appraisals to formulate and test predictions for their analogues, probability, and legitimacy. Correspondences and contrasts were derived from Figures 1 through 4 and are detailed in footnotes to Table 2.

Table 1
 Mean Appraisal Ratings for Recalled Experiences of Each Emotion, With Overall Significance Tests and Effect Sizes

Appraisal	Emotion recalled														Overall F^a	η^2		
	Jy	Rl	Ho	Af	Pr	Su	Dg	Ds	Sd	Fe	Fr	Un	An	Sh			Gu	Rg
Situational state																		
Experience 1	8.30	5.87	4.70	5.93	7.97	6.77	2.24	3.04	3.40	2.48	2.21	3.40	2.39	3.42	2.44	2.90	11.47***	.54
Experience 2	8.22	6.83	7.73	7.40	7.63	6.55	2.04	2.17	2.44	3.73	2.45	2.21	2.50	2.61	2.97	4.19	16.08***	.62
Motivational state																		
Experience 1	7.27	5.77	5.36	5.44	7.07	6.73	4.94	4.15	5.47	3.81	5.42	5.77	5.85	4.67	4.33	3.55	3.47***	.26
Experience 2	7.63	4.73	6.83	7.37	6.78	6.42	3.81	4.85	3.96	3.97	5.36	4.48	4.03	4.30	4.17	6.06	3.29***	.25
Probability																		
Experience 1	6.27	4.47	4.21	4.56	5.77	4.33	5.48	5.19	4.80	4.07	4.58	5.70	5.18	4.03	6.26	4.30	1.53	.14
Experience 2	5.50	3.00	3.93	5.47	5.04	4.42	6.15	3.67	5.37	4.23	4.85	5.00	4.40	4.21	4.93	5.74	1.76*	.15
Power																		
Experience 1	6.67	4.88	4.94	6.04	7.40	5.47	3.48	3.78	4.10	3.52	4.09	5.63	4.45	3.36	4.00	4.53	3.48***	.26
Experience 2	6.87	4.70	5.73	6.07	6.37	6.58	3.74	3.12	4.04	4.00	4.21	4.52	4.30	4.06	4.50	3.85	3.26***	.25
Legitimacy																		
Experience 1	7.25	5.56	6.82	5.67	6.95	7.35	6.64	6.06	6.00	5.61	7.36	7.45	7.86	3.14	3.22	5.55	5.60***	.37
Experience 2	6.83	6.65	7.40	7.45	6.72	6.55	7.88	6.41	6.83	7.25	7.14	7.45	6.10	6.41	4.45	6.56	1.63 ^c	.15
Circumstance agency																		
Experience 1	4.70	5.44	6.18	5.33	2.00	3.10	3.36	2.56	5.90	5.44	4.36	5.00	2.80	2.36	2.67	5.50	3.24***	.25
Experience 2	4.00	5.80	4.10	2.90	2.44	4.73	1.75	6.60	6.89	4.70	3.82	4.45	4.40	3.27	3.70	3.00	2.50***	.21
Other-person-agency																		
Experience 1	6.20	4.10	4.64	5.22	1.80	7.50	6.27	4.67	4.70	5.89	6.27	5.00	8.00	3.00	3.67	5.40	3.08***	.24
Experience 2	4.56	4.20	5.50	6.78	3.44	6.55	7.44	4.30	4.33	6.20	5.64	8.00	6.70	5.55	2.40	5.44	3.32***	.26
Self-agency																		
Experience 1	5.40	4.10	4.36	4.89	7.78	3.10	5.18	5.56	4.00	5.00	3.82	4.40	4.18	7.55	6.44	5.50	2.16**	.18
Experience 2	6.50	5.30	5.50	5.00	7.89	4.73	3.56	3.91	4.00	2.60	3.09	3.82	3.50	5.82	7.30	5.44	2.93***	.23

Note. Jy = joy; Rl = relief; Ho = hope; Af = affection; Pr = pride; Su = surprise; Dg = disgust; Ds = distress; Sd = sadness; Fe = fear; Fr = frustration; Un = unfriendliness; An = anger; Sh = shame; Gu = guilt; Rg = regret. For situational state, higher scores indicate greater consistency with motives; for motivational state, higher scores indicate greater appetitive (reward) motivation; for probability, higher scores indicate greater certainty; for power, higher scores indicate greater power; for legitimacy, higher scores indicate more deserving of a positive outcome; for circumstance-agency, higher scores indicate greater cause by other persons; for other-agency, higher scores indicate greater cause by other persons; for self-agency, higher scores indicate greater cause by self.

^a $df_s = 15, 145$ unless otherwise noted. ^b $df_s = 15, 144$. ^c $df_s = 15, 143$. ^d $df_s = 15, 142$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Contrast Weights and Significance Tests for Predicted Relationships Between Appraisals and Emotions

Appraisal	Emotion recalled													Experience 1			Experience 2						
	Jy	Rl	Ho	Af ^a	Pr	Su	Dg	Ds	Sd	Fe	Fr	Un ^r	An ^r	Sh	Gu	Rg	Contrast <i>t</i>	eta ²	Residual <i>F</i> ^d	Contrast <i>t</i>	eta ²	Residual <i>F</i> ^d	
Situational state																							
Roseman (1984) ^e	+2	+2	+2	+2	+2	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	10.91***	.46	3.51†††	14.49***	.59	2.21††	
Scherer (1988) ^f	+1	np	np	np	+1	np	0	np	-1	np	np	np	-1	0	+1	np	8.01***	.24	8.97†††	6.72***	.24	14.00†††	
Arnold (1960) ^g	+4	np	+4	np	np	np	np	np	-3	np	-3	np	-3	np	np	np	7.32***	.26	8.63†††	10.95***	.45	8.66†††	
Motivational state																							
Roseman (1984) ^h	+3	-2	0	0	0	0	-2	+3	0	0	0	0	0	0	0	0	2.67**	.05	3.20†††	1.96*	.03	3.26†††	
Scherer (1988)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—
Arnold (1960)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—
Probability																							
Roseman (1984) ⁱ	+4	+4	-5	0	0	-10	+4	+4	+4	-5	0	0	0	0	0	0	2.17*	.03	1.30	1.05	.01	1.78*	
Scherer (1988) ^j	+1	np	np	np	+1	np	+1	np	+1	-7	np	np	+1	+1	+1	np	1.94*	.03	1.37	1.29	.01	1.76	
Arnold (1960) ^k	+2	np	-3	0	np	np	np	np	np	+2	-3	np	0	np	np	np	2.30*	.04	1.26	1.77*	.02	1.63	
Power																							
Roseman (1984) ^l	0	0	0	0	0	0	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	.87	.01	3.67†††	.28	.00	3.49†††	
Scherer (1988) ^m	0	np	np	np	0	np	0	np	-1	-1	np	np	+2	0	0	np	.85	.00	5.08†††	.36	.00	3.49†††	
Arnold (1960) ⁿ	+1	np	-1	+1	np	np	np	np	np	+1	-2	np	-1	np	np	np	2.92**	.06	3.11†††	1.71*	.02	3.29†††	
Legitimacy																							
Roseman (1979) ^o	0	0	0	0	0	0	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	3.69***	.09	5.03†††	-17	.00	1.75 ^q	
Scherer (1988) ^r	0	np	np	np	+1	np	0	np	0	0	np	np	+1 ^s	-1	-1	np	7.21***	.27	2.29†††	1.62	.02	1.56 ^q	
Arnold (1960)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—
Circumstance-agency																							
Roseman (1984) ^t	+7	+7	+7	-9	-9	+7	+7	+7	+7	+7	-9	-9	-9	-9	-9	-9	2.22*	.03	3.12†††	2.89**	.06	2.08††	
Scherer (1988) ^u	0	np	np	np	-1	np	0	np	0	+4	np	np	-1	-1	-1	np	3.22**	.07	2.73†††	1.30	.01	2.56†††	
Arnold (1960)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—
Other-person-agency																							
Roseman (1984) ^v	-3	-3	-3	+13	-3	-3	-3	-3	-3	-3	-3	+13	+13	+13	-3	-3	1.94*	.03	3.03†††	4.02***	.10	2.41†††	
Scherer (1988) ^w	0	np	np	np	-2	np	0	np	0	+3	np	np	+3	-2	-2	np	4.89***	.14	1.59	3.54***	.08	2.67†††	
Arnold (1960)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—
Self-agency																							
Roseman (1984) ^x	-1	-1	-1	-1	+3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	4.51***	.12	.87 ^p	4.55***	.12	1.66	
Scherer (1988) ^y	0	np	np	np	+2	np	0	np	0	-3	np	np	-3	+2	+2	np	3.28***	.07	1.55 ^p	4.94***	.14	1.39	
Arnold (1960)	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	np	—	—	—	—	—	—	—

Note: Jy = joy; Rl = relief; Ho = hope; Af = affection; Pr = pride; Su = surprise; Dg = disgust; Ds = distress; Sd = sadness; Fe = fear; Fr = frustration; Un = unfriendliness; An = anger; Sh = shame; Gu = guilt; Rg = regret; np = no prediction, 0 entered as contrast weight.

^a liking (Roseman, 1984); love, liking (Arnold, 1960). ^b dislike (Roseman, 1984); hate, dislike (Arnold, 1960). ^c rage/hot anger (Scherer, 1988). ^d dfs = 14, 145 unless otherwise noted. ^e - = motive-inconsistent; 0 = open; + = motive-consistent. ^f - = obstructive; 0 = open; + = very conducive or high conduciveness. ^g - = harmful; + = beneficial. ^h - = aversive; 0 = open; + = appetitive. ⁱ -10 = extremely uncertain; -5 = uncertain; 0 = open; + = certain; j - = high; + = very high. ^k - = not present; 0 = open; + = present. ^l - = weak; 0 = open; + = strong; ^m - = very low; 0 = open; + = high. ⁿ -2 = too difficult; -1 = difficult; +1 = easy. ^o - = deserve a negative outcome; 0 = open; + = deserve a positive outcome. ^p dfs = 14, 144. ^q dfs = 14, 143. ^r - = low compatibility; 0 = open; + = high compatibility with internal standards. ^s + = other's action has low compatibility with experimenter's internal standards coded as positive outcome deserved. ^t - = other person or self; + = circumstances. ^u - = other or self; 0 = open; + = nature. ^v - = circumstances or self; + = other person. ^w dfs = 14, 142. ^x - = self; 0 = open; + = other person. ^y - = circumstances or other; + = self. ^z - = nature or other; 0 = open; + = self.

* $p < .05$, one-tailed. ** $p < .01$, one-tailed. *** $p < .001$, one-tailed. † $p < .05$, two-tailed. †† $p < .01$, two-tailed. ††† $p < .001$, two-tailed.

As shown in Table 2, for the situational state appraisal, all three theories received significant support across both recalled experiences; η^2 was highest for predictions made according to Roseman's (1984) theory. For motivational state, only Roseman's theory made predictions, and these received significant support. For probability and power, predictions made by Arnold's (1960) theory were most strongly supported. For legitimacy, only Roseman and Scherer made predictions, and Scherer's received most support. Predictions for agency were also made only by Roseman and by Scherer. For circumstance causation, only Roseman's hypotheses received consistent significant support. For other-person-agency and self-agency, there was significant support for both theories in both recalled experiences.

Thus each theory made the most accurate predictions for some appraisals. Significant residuals in Table 2 also indicate that there were additional relationships between appraisals and emotions beyond those specified by any one theory. The sources of observed differences in relative predictive accuracy are now considered, as we discuss what we have learned about appraisals that differentiate among emotions and the relationships between particular appraisals and particular emotional responses.

Discussion

Appraisals of Events That Differentiate Among Discrete Emotions

Roseman (1984) specified five appraisals of antecedent events that would differentiate among discrete emotions. Our investigation found considerable evidence for each of them. Across both sets of emotion-eliciting events recalled by subjects, there were significant differences between emotions in appraisals of situational state, motivational state, power, and agency. Differences between emotions in appraisals of probability were significant in one set of experiences and approached significance in the other. These findings support the theory's claims that the particular emotion(s) experienced in response to an event depend(s) on whether the event is perceived as inconsistent or as consistent with a person's motives; whether motives relevant to the event involve decreasing one's punishments or increasing one's rewards; whether one sees oneself as weak or strong in the situation; whether the event is seen as caused by circumstances, other persons, or the self; and whether the event's occurrence is judged to be uncertain or certain.

Differences between emotions in appraisals of legitimacy were significant in one set of experiments and approached significance in the other. Thus, the particular emotion(s) experienced may also depend on whether one believes that a negative outcome was deserved or that a positive outcome was deserved in the situation.

Relationships Between Particular Appraisals and Particular Emotions

Situational state as differentiating positive from negative emotions. Results of this study showed strong support for the proposed relationships between the reconceptualized situational

state appraisal (Roseman, 1984) and particular emotions. As was shown in Table 1, positive emotions (joy, relief, hope, affection, and pride) occurred in situations appraised as relatively motive-consistent, whereas negative emotions (disgust, distress, sadness, fear, frustration, unfriendliness, anger, shame, guilt, and regret) occurred in situations appraised as motive-inconsistent.

The contrast tests in Table 2 showed that situational state predictions that were based on each of the three theories we tested received significant support. Why were effect sizes highest for Roseman's (1984) predictions?

Predictions that were based on Scherer's (1988) theory followed his identification of Roseman's situational state appraisal with goal obstruction/conduciveness, as distinct from intrinsic unpleasantness/pleasantness. For example, according to Scherer (1988), it is not inconsistency with motives (obstruction of goals), but rather intrinsic unpleasantness, that leads to disgust. However, our data showed that subjects did appraise events leading to disgust as being inconsistent with their motives.⁴

Scherer (1988) also predicted that shame would result from events either obstructive or conducive to one's goals and that guilt would result from goal-conducive (motive-consistent) incidents. The data indicate, however, that incidents leading to both shame and guilt are seen as motive-inconsistent. In our view, Scherer may be correct in the sense that events leading to shame or guilt need not be motive-inconsistent in all aspects, as when a person feels guilty about successfully cheating on an exam (Roseman, 1979). However, in such instances, the person feels guilty about the illegitimate aspects of the event (e.g., having cheated), and these (or their imagined consequences) are motive-inconsistent.

Situational state predictions made by Arnold (1960) and Roseman (1984) are identical on all emotions studied that are encompassed by both theories (see Table 2). Thus, it is the extension of predictions to a greater number of positive and negative emotions that results in greater effect sizes for the contrasts testing Roseman's predictions here.

Significant residual variation seems attributable to two factors. First, there was lower motive-consistency in relief and hope than in joy or pride. This may be explained by the fre-

⁴ Scherer's (1984, 1988) proposal that the intrinsic unpleasantness or pleasantness of an event may lead to particular negative or positive emotions was echoed by Smith and Ellsworth (1985), citing emotional reactions to sunny days and music. In our view, however, even simple stimuli are not intrinsically unpleasant or pleasant. For example, individual differences in musical preference mean that the same sounds that are pleasant to one person are unpleasant to another. Also, as individuals, we sometimes want to hear rock music and sometimes very definitely do not; our emotional reaction varies accordingly. Thus, at some level, a stimulus must be appraised as negative or positive in reference to the motives (goals and preferences) of a particular person at a particular time. It is an appraisal of inconsistency/consistency with current motives that determines whether an event is experienced as unpleasant or pleasant (Frijda, 1987; Scherer, 1988; Smith & Ellsworth, 1985), displeasing or pleasing (Ortony, Clore, & Collins, 1988), stressful or benign (Lazarus, 1968). In fact, individual and temporal differences in motives may be an important noncognitive source of individual differences in emotional response to an event.

quent occurrence of the specific positive events producing relief and hope within a negative situational context. That is, relief and hope are often caused by the termination and anticipated termination of a motive-inconsistent event. Second, there were unpredicted appraisals of motive-consistency in events leading to surprise. This may have been due to a tendency to recall positive over negative surprises, particularly when the same subjects were asked to recall experiences of hope.

Motivational state as differentiating joy from relief, and sadness from disgust and distress. Results of the study also supported hypotheses relating appraisals of motivational state to particular emotions. As shown in Table 1, motivation to attain reward was characteristic of events leading to joy, but motivation to avoid punishment was more relevant to events eliciting relief. Among negative emotions, motivation to attain reward was characteristic of events eliciting sadness in the first (though not the second) recalled experience, but motivation to avoid punishment was relevant to events eliciting disgust and distress in both experiences. The consistently significant findings for the motivational state appraisal argue that the distinction between seeking reward and avoiding punishment, unique to Roseman's (1979, 1984) appraisal theory, should be included in an adequate account of the factors differentiating among emotions, to distinguish joy from relief, and sadness from disgust and distress.

Why were relationships of aversive motivation to relief and appetitive motivation to sadness less strongly supported than the other hypothesized relationships? Subjects' narratives suggest that this might have been because relief can be experienced when a feared loss of reward is averted (e.g., tests show a loved one's health is not in danger) and sadness experienced when a hoped-for avoidance of punishment does not materialize (e.g., there is nothing one can do to help an injured animal). In the first case, though good health is something desirable, aversive motivation may come from fear (which is then reduced, leading to relief); in the latter instance, though injuries are aversive, appetitive motivation may come from hope for improvement (which is unfulfilled, producing sadness).

Significant residual variation may be attributable to a general association of motive type with positive versus negative emotion. Though it is possible to feel good about nonaversive events (e.g., avoiding injury) and bad in response to nonreward (e.g., separation from loved ones), there appears to be a tendency for the seeking of reward to elicit positive emotions and for the avoidance of punishment to elicit negative emotions (see Table 1).

Probability as differentiating hope from joy, and fear from disgust. Results for the probability appraisal were only sometimes in accord with Roseman's (1984) hypotheses. Among positive emotions, certainty was perceived in events eliciting joy, and uncertainty was perceived in events eliciting hope, in both experiences, as predicted. However, uncertainty was also consistently perceived in events eliciting relief. Among negative emotions, as predicted, certainty was low in events producing fear and was high in events eliciting disgust. Appraisals of certainty were associated with distress and sadness in one experience only. As predicted, surprise incidents were appraised as uncertain; however, in neither experience were they perceived

as more uncertain than in hope or fear incidents, as had been predicted.

As for alternative theories, Scherer's (1988) predictions did not receive consistent support because certainty was not consistently high in incidents producing anger, shame, or guilt. However, predictions that were based on Arnold's (1960) theory were consistently supported, because certainty was high in joy and low in hope and fear. Arnold's certainty predictions for sadness and anger were supported in one experience only. Overall, then, strongest support was found for hypothesized linkages of uncertainty to hope (Arnold, Roseman) and fear (Arnold, Roseman, Scherer), and of certainty to joy (Arnold, Roseman, Scherer) and disgust (Roseman).

An examination of subjects' narratives provides an explanation for the uncertainty reported in experiences of relief. Apparently, subjects had difficulty focusing on the appraisals that caused relief, to the exclusion of appraisals that caused other emotions but were part of the same experience. As Lazarus, Kanner, and Folkman (1980) have pointed out, the same event may be appraised and reappraised in different ways over time, producing differing emotions.

For example, one subject said she felt relief when medical tests showed that her mother did not have cancer. This subject's appraisal ratings indicated much uncertainty. However, close inspection of the narrative indicated that two different appraisals of probability produced two different emotions. In the first part of the experience, the subject overheard her relatives say her mother "might have cancer"; this caused her to feel "scared." Later, when the test results were known, "the fact that my mother did not have cancer" caused her to feel relief; the word *fact* indicates an appraisal of certainty. Here an initial appraisal of uncertainty aroused fear, but a subsequent reappraisal of certainty produced relief—as predicted by Roseman's (1984) theory.

The reporting of appraisals leading to other emotions seems particularly likely to confound results for relief, because it often occurs immediately following negative emotions such as distress or fear.

With regard to surprise, examination of subjects' narratives supports the data indicating it is not extreme uncertainty that causes surprise, as Roseman (1984) had predicted. For example, one subject felt surprise on learning that her family would visit for the weekend, because "I didn't expect to see my family so soon." Here surprise resulted not from uncertainty, but from knowing what was happening. Experiences like this fit well with the hypothesis that unexpectedness (see, e.g., Izard, 1977, Scherer, 1984), misexpectedness (Charlesworth, 1969), or novelty (Scherer, 1988) causes surprise. Perhaps, then, unexpectedness should be considered a sixth emotion-relevant appraisal that leads specifically to surprise. Alternatively, the probability appraisal might be reformulated to distinguish between events appraised as unexpected (leading to surprise) versus expected (leading to hope or fear) versus certain (leading to emotions such as joy or disgust).

Power or legitimacy as differentiating among emotions. As shown in Figure 2, Roseman (1984) predicted that when a negative outcome occurred, appraising oneself as strong would elicit frustration, anger, or regret, as opposed to other negative emo-

tions. As was shown in Figure 1, Roseman (1979) had predicted that when a negative outcome occurred, the appraisal that a positive outcome was deserved would elicit frustration, anger, or regret, as opposed to other negative emotions. Our data supported neither of these predictions.

Whereas Table 1 showed that appraisals of power did differ significantly among emotions, Tables 1 and 2 revealed that people did not perceive themselves as particularly powerful in situations leading to frustration, anger, and regret.

Examining hypotheses from other theories, we noted that there was also no significant support for Scherer's (1988) prediction that power would be higher in events producing anger than in events producing fear or sadness. Arnold's (1960) hypotheses, however, did receive significant support, because power was appraised as high in events eliciting joy and affection, relatively low in events eliciting anger, and particularly low in events eliciting fear. Other predictions made by Arnold (that power would be low for hope events and high for sadness or unfriendliness events) were not consistently supported. In fact, the means in Table 1 suggest that power was perceived as relatively high in experiences of positive emotions and relatively low in experiences of negative emotions. This pattern appears to be the source of significant residual variation in power ratings.

Do appraisals of power, then, influence whether a positive or negative emotion is experienced, rather than which negative emotion will be felt? Perhaps this was the case for power, as it was measured by our questions. Asking subjects whether they were strong or weak, powerful or powerless, may have measured their perceived capacity to influence the occurrence of the emotion-eliciting event, rather than their capacity to respond to it prospectively. That is, subjects may have appraised themselves as powerless across all negative emotions because they did not prevent the occurrence of a negative event. Believing one is powerless may also be motive-inconsistent in itself and thus increase negative emotions. In contrast, perhaps assessing subjects' power to respond to an event would discriminate among negative emotions. If one can respond effectively to a negative event, one may feel angry rather than afraid or sad (cf. Lazarus & Folkman, 1984, p. 33).

Another possibility is that an alternative conceptualization of power, or some similar appraisal, determines whether a person feels a negative emotion that will move away (as in fear) rather than move against (as in anger) a motive-inconsistent stimulus (cf. Horney, 1950). Candidate appraisals include controllability (Frijda, 1986; Scherer, 1988; cf. Seligman, 1975; Weiner, 1985) and coping potential (Lazarus & Smith, 1988; Scherer, 1988). Controllability may refer to the intrinsic controllability of an event (Scherer, 1988) or to its controllability by means of one's own actions (Frijda, 1986). Coping potential focuses on the relationship between the person and the event (cf. Lazarus & Smith, 1988). Perhaps, regardless of our own power, if a motive-inconsistent event is uncontrollable or more powerful than we are, we feel emotions such as fear or sadness, rather than anger.

As for legitimacy, Table 1 had shown that this appraisal differed significantly among emotions in the first but not the second experience recalled by subjects. Across the two experiences, subjects believed that they deserved a positive outcome

in experiences of frustration, anger, and regret, as predicted by Roseman (1979). However, subjects also reported deserving a positive outcome in all other emotions except shame (in the first experience recalled) and guilt (in both experiences).

Scherer's (1988) legitimacy predictions received greater support because deserving a positive outcome was characteristic of anger and deserving a negative outcome was characteristic of guilt. Subjects also believed that a positive outcome was deserved in experiences of pride, but no more so than in experiences of other positive emotions such as joy or hope (see Table 1). Deserving a negative outcome was characteristic of shame in the first but not the second experience recalled.

The variability in our legitimacy findings may indicate that this appraisal sometimes distinguishes among emotions, but does not necessarily do so. For example, Roseman (1984) proposed that appraisals of legitimacy influence emotions only insofar as being in the right puts one into a position of strength—that is, when legitimacy is a source of power.

Alternatively, legitimacy may have a consistent influence on some but not all negative emotions. For example, as indicated by our data, deserving a negative outcome may be a consistent determinant of guilt, but not of shame. It seems that one can be ashamed of illegitimate actions or of things about the self unrelated to legitimacy (e.g., one's physical appearance). Perhaps illegitimate actions lead to shame only when perceived to indicate some characterological inadequacy (cf. Lewis, 1979).

Agency as differentiating among event-directed, other-directed, and self-directed emotions. Overall, as was shown in Table 2, hypotheses proposed by Roseman (1984) and by Scherer (1988) were generally supported for emotions felt toward human agents. As was shown in Table 1, other people were seen as causes of events eliciting affection (as predicted by Roseman), anger (Roseman, Scherer) and unfriendliness (Roseman), though the link to unfriendliness was weak in the first recalled experience. The self was seen as causing events eliciting pride (as predicted by Roseman and by Scherer), shame (Roseman, Scherer), guilt (Roseman, Scherer), and regret (Roseman), with circumstances (in the first recalled experience) and other people (in both experiences) also seen as causes when regret was felt. These results provide good evidence that agency should be included in an adequate account of the appraisals that differentiate among emotions (cf. Ortony, Clore, & Collins, 1988; Weiner, 1985), though it had not been mentioned in Arnold's (1960) theory.

However, hypotheses about emotions caused by "impersonal circumstances" (Roseman, 1984) or by "nature" (Scherer, 1988) were not as well supported. As was shown in Table 2, only Roseman's circumstance-agency predictions received consistent significant support, because subjects perceived high circumstance-causation in events eliciting relief and sadness and low circumstance-causation in events eliciting pride, anger, shame, and guilt (the latter four predictions also correctly made by Scherer's theory). Scherer's circumstance-agency prediction for fear and Roseman's predictions for hope, affection, distress, fear, and regret were supported in one experience only. Contrary to Roseman's predictions, subjects consistently appraised other people rather than circumstances as causes of events eliciting surprise, disgust, and frustration, and the self as cause in

events producing joy. Significant residual variation beyond both theorists' predictions is at least partly attributable to low circumstance-causation in disgust.

Why were other people seen as causes in experiences of surprise, disgust, and frustration, and the self seen as a cause in instances of joy? It seems doubtful that these emotions are necessarily caused by other people or the self rather than impersonal circumstances. One can be surprised by a vanishing object (Hiatt, Campos, & Emde, 1979), disgusted by bad tastes (Izard, 1977), frustrated by unsolvable tasks (Glass & Singer, 1972), and joyful on being with friends in nature (Izard, 1972).

One possibility is that, as Scherer's (1988) theory proposes, any causal appraisal (self, other, or natural causes) is compatible with feeling emotions such as disgust or joy. Another possibility is that we feel these emotions if we focus on an event rather than its agent. If we focus on another person or the self as causing the event, we feel an emotion toward the agent rather than an emotion toward the event.

We suggest that surprise, disgust, and frustration—as well as joy, relief, hope, distress, sadness, and fear—can be experienced either (a) when an event is appraised as caused by circumstances, (b) when no cause is specified for an event, or (c) when a causal agent is identified but the agency information is disregarded in a person's focus on the event itself. For example, we may feel frustration if we attribute a low course grade to the circumstance of hard-to-learn material, if we do not think about why the grade was low, or even if we see the teacher as causing the low grade, as long as we focus on the grade itself and not its cause. Focusing on the teacher as the cause of the low grade, on the other hand, prompts us to feel an emotion toward him or her (e.g., anger).

If so, it may be more appropriate to refer to joy, relief, hope, surprise, distress, disgust, sadness, fear, and frustration as event-directed emotions (in which the cause of an event is disregarded, unspecified, or identified as circumstances beyond anyone's control); to affection, unfriendliness, and anger as other-directed emotions (cause identified as other people); and to pride, shame, guilt, and regret as self-directed emotions (cause identified as self). This is similar to the distinction between outcome dependent emotions (e.g., happiness, sadness, and frustration) and attribution dependent emotions (e.g., anger, shame, guilt, surprise), proposed by Weiner (1985).

Importance of This Research

Results of our study provide significant support for major aspects of Roseman's (1984) theory of the cognitive and motivational determinants of discrete emotions. Using procedures designed to address past methodological difficulties, we found evidence supporting numerous hypotheses linking particular appraisals to particular emotions.

Support for predictions from Roseman's (1984) theory in this study of actually experienced emotions adds to supportive findings in the vignette study reported in Roseman (1983). Moreover, the two studies complement each other's strengths and weaknesses, increasing our confidence in the observed appraisal-emotion relationships. The vignette methodology, by manipulating appraisals and measuring which emotions would be felt, shows the causal impact of particular appraisals on

particular emotions but cannot prove that these relationships hold in genuine emotion experiences. The retrospective methodology used in the present study does not prove causal direction but provides good evidence of external validity. Thus, the present study, taken in the context of previous research, suggests that the hypothesized appraisals cause the specified emotional responses in genuine emotion experiences.

Our study's support for situational state, probability, and agency as three of the appraisals that reliably differentiate among emotions complements similar findings in studies by Frijda and by Smith and Ellsworth. Though Frijda (1987) asked about typical emotion experiences, convergent results from our study of actual emotion-eliciting events (see also Frijda et al., 1989) make it unlikely that Frijda's (1987) findings reflect merely subjects' emotion knowledge or naive theories about the typical causes of emotions. Though Smith and Ellsworth (1985, 1987) and Ellsworth and Smith, (1988a, 1988b) asked about appraisals made during emotion experiences, convergent results from our study of events perceived to cause emotions show that situational state, probability, and agency are recognized as antecedents, not merely correlates, of emotional responses. Overall, the convergent evidence increases our confidence that support for these appraisals is not attributable to methodological idiosyncracies.

In addition, by comparing predictions made by Arnold (1960), Roseman (1979, 1984), and Scherer (1988), we were able to identify not only many cases of agreement but also conflicting claims about appraisal-emotion relationships, to use our data to help resolve them, and to offer theoretical revisions that reflect these resolutions.

Specifically, we have argued (a) that an appraisal of motive-inconsistent versus motive-consistent situational state (Roseman, 1984; cf. Arnold, 1960; Scherer, 1988) determines whether negative versus positive emotions will be experienced; (b) that an appraisal of motivational state (Roseman, 1984) is needed to distinguish joy from relief, and sadness from distress or disgust; (c) that an appraisal of probability distinguishes hope and fear from emotions such as joy and disgust; (d) that an appraisal of unexpectedness (Izard, 1977; Scherer, 1984) or novelty (Scherer, 1988), rather than uncertainty (Roseman, 1984), leads to surprise; (e) that an appraisal of power (Roseman, 1984; Scherer, 1988; cf. Arnold, 1960) influences one's situational state and thus elicits negative versus positive emotions but that if conceptualized as the capacity to respond effectively to an event, or as coping potential (Lazarus & Smith, 1988; Scherer, 1988), or as controllability (Seligman, 1975; Weiner, 1985), this appraisal may also differentiate among negative emotions; (f) that appraisals of legitimacy (Roseman, 1979; Scherer, 1988) either influence emotions through other appraisals or affect only a limited number of emotions, such as guilt; (g) that appraisals of agency (Roseman, 1984; Scherer, 1988) should be included in a comprehensive theory of emotions, with attributing causation to the self eliciting pride, shame, guilt, or regret; attributing causation to others eliciting love, anger, or dislikes; and attributing causation to impersonal circumstances, or not making a causal attribution, or focusing attention on an event rather than its agent, producing joy, relief, hope, surprise, disgust, distress, sadness, fear, or frustration.

Future Directions

Our results suggest at least two directions for future research.

First, particular appraisal–emotion relationships have been identified as needing further study. For example, research is needed to assess relationships that our findings called into question. Most prominent among these is the issue of whether legitimacy, power, or some alternative appraisal(s) (e.g., prospective power, coping potential, or controllability) help(s) determine which emotions a person will experience. Hypothesized relationships of appetitive motivation to sadness, aversive motivation to relief, and perceived certainty to relief, distress, and sadness also need further testing.

Moreover, research is needed to test new hypotheses formulated in light of our findings. Do appraisals of unexpectedness or novelty, rather than uncertainty, produce surprise? Does the absence of an agency appraisal, or a focus on events instead of agents, lead to emotions such as joy, surprise, disgust, and frustration?

Second, although no single study can test all possible hypotheses, it would be desirable for future research to extend the enterprise pursued here to new appraisals, emotions, and theories of appraisal–emotion relationships. For example, new studies might test relationships between appraisals of suddenness (Scherer, 1988) or of importance (Frijda et al., 1989) and particular emotions; might examine which appraisals elicit the recently validated emotion of contempt (Ekman & Friesen, 1986); and might make comparisons with other recent theories, such as those of Weiner (1985) or of Ortony, Clore, and Collins (1988).

For future studies, we also recommend two alternative methodologies. The first is suggested by our examination of subjects' narratives, which indicated that multiple appraisals of the same event may obscure specific appraisal–emotion links. If so, perhaps asking subjects to report the appraisal(s) that led to their emotion, rather than the appraisals of the event that led to the emotion, would clarify these relationships.

Second, obtaining causal data on actual emotion experiences would also be desirable. To date, laboratory experiments (e.g., Graham, 1988; Roseman, 1983; Weiner, Graham, & Chandler, 1982; Weiner, Russell, & Lerman, 1978) have generated causal data by using hypothetical scenarios to manipulate appraisals and to measure emotions. Questionnaire studies like ours (see also Ellsworth & Smith, 1988a, 1988b; Frijda et al., 1989; Smith & Ellsworth, 1985, 1987; Weiner, Russell, & Lerman, 1979) have measured appraisals and emotions about events that actually took place, to provide external validity. However, relationships would be more firmly established if internally and externally valid data were produced in a single study. Such data might be obtained by manipulating appraisals and measuring genuine emotions in the laboratory or the field. For example, subjects' appraisals of power or legitimacy in the face of failure might be manipulated, and then their anger responses measured (see Pastore, 1952, for an example of this type of research).

The present study tested numerous hypotheses about relationships between particular appraisals and particular emotions. To conduct these tests, we focused subjects on appraisals of antecedent events, rather than appraisals made while feeling

an emotion, and examined their relationships to actual, rather than hypothetical, emotion experiences. Results provide empirical support for dozens of specific hypotheses from Roseman's (1984) theory and from the theories of Arnold (1960) and Scherer (1988). Other hypotheses were not supported, and new hypotheses were generated in many of these cases. In all these ways, this research helps to advance our knowledge from the stage of identifying which appraisals are emotion-relevant to the stage of testing hypotheses about specific appraisal–emotion relationships.

Future studies that test new or unconfirmed hypotheses and investigate additional appraisals, emotions, or appraisal–emotion relationships are suggested next steps in developing a comprehensive, integrated understanding of when and why we have the feelings that we do.

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Appendix

Questions and Response Scale Anchors for Items Measuring Appraisals

Situational State

At the time, did you think of “SPECIFIC EVENT A” as consistent with what you wanted, or as inconsistent with what wanted? *Very much consistent with what I wanted* (1) to *very much inconsistent with what I wanted* (9)*

At the time, was “SPECIFIC EVENT A” wanted by you, or unwanted by you? *Very much wanted* (1) to *very much unwanted* (9)*

At the time, did you believe that “SPECIFIC EVENT A” improved things or did you believe “SPECIFIC EVENT A” made things worse? *Very much improved things* (1) to *very much made things worse* (9)*

Motivational State

At the time, were you reacting to “SPECIFIC EVENT A” mostly because you wanted to get or keep something pleasurable, or mostly because you wanted to get rid of or avoid something painful? *Mostly because I wanted to get or keep something pleasurable* (1) to *mostly because I wanted to get rid of or avoid something painful* (9)*

At the time, did you want to minimize some cost in “SPECIFIC EVENT A,” or maximize some benefit? *Very much wanted to minimize some cost* (1) to *very much wanted to maximize some benefit* (9)

During “SPECIFIC EVENT A,” were you seeking less of something negative, or more of something positive? *Very much seeking less of something negative* (1) to *very much seeking more of something positive* (9)

Probability

During “SPECIFIC EVENT A,” how well could you predict what was going to happen in this situation? *Not at all well* (1) to *very well* (9)

At the time, how uncertain were you about what the consequences of “SPECIFIC EVENT A” were going to be? *Not at all uncertain* (1) to *very uncertain* (9)*

During “SPECIFIC EVENT A,” how much were you in doubt about what was actually occurring? *Not at all in doubt* (1) to *very much in doubt* (9)*

Power

During “SPECIFIC EVENT A,” did you feel powerful or powerless? *Very powerful* (1) to *very powerless* (9)*

During “SPECIFIC EVENT A,” did you believe that you were weak or strong? *Very weak* (1) to *very strong* (9)

At the time, did you believe that you were unable to cope with “SPECIFIC EVENT A,” or that you were able to cope with it? *Very much unable to cope* (1) to *very much able to cope* (9)

Legitimacy

At the time, did you believe that the occurrence of "SPECIFIC EVENT A" was an injustice to you? *Not at all an injustice to me* (1) to *very much an injustice to me* (9)*

During "SPECIFIC EVENT A," did you believe that you deserved for something bad to happen, or for something good to happen? *Very much deserved for something bad to happen* (1) to *very much deserved for something good to happen* (9)

During "SPECIFIC EVENT A," did you think of yourself as morally right or morally wrong? *Very much morally right* (1) to *very much morally wrong* (9)*

Circumstance-Agency

At the time, how much did you think that "SPECIFIC EVENT A" was caused by circumstances beyond anyone's control? *Not at all caused by circumstances beyond anyone's control* (1) to *very much caused by circumstances beyond anyone's control* (9)

Other-Person-Agency

At the time, how much did you think that "SPECIFIC EVENT A" was caused by someone else? *Not at all caused by someone else* (1) to *very much caused by someone else* (9)

Self-Agency

At the time, how much did you think that "SPECIFIC EVENT A" was caused by you? *Not at all caused by me* (1) to *very much caused by me* (9)

Note. An asterisk (*) indicates responses are reverse coded.

* This question was poorly correlated with other legitimacy items and was dropped from the scale.

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