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If It Changes It Must Be a Process: Study of Emotion and Coping During Three Stages of a College Examination

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This natural experiment provides substantial evidence for the following major themes, which are based on a cognitively oriented, process-centered theory of stress and coping: First, a stressful encounter should be viewed as a dynamic, unfolding process, not as a static, unitary event. Emotion and coping (including the use of social support) were assessed at three stages of a midterm examination: the anticipation stage before the exam, the waiting stage after the exam and before grades were announced, and after grades were posted. For the group as a whole there were significant changes in emotions and coping (including the use of social support) across the three stages. Second, people experience seemingly contradictory emotions and states of mind during every stage of an encounter. In this study, for example, subjects experienced both threat emotions and challenge emotions. The complexity of emotions and their cognitive appraisals reflects ambiguity regarding the multifaceted nature of the exam and its meanings, especially during the anticipation stage.

Third, coping is a complex process. On the average, subjects used combinations of most of the available forms of problem-focused coping and emotion-focused coping at every stage of the exam. Different forms of coping were salient during the anticipation and waiting stages. Problem-focused coping and emphasizing the positive were more prominent during the former, and distancing more prominent during the latter.

Finally, despite normatively shared emotional reactions at each stage, substantial individual differences remained. Using selected appraisal and coping variables, and taking grade point averages (GPA) into account, approximately 48% of the variances in threat and challenge emotions at the anticipation stage was explained. Controlling for variance due to the grade received, appraisal, and coping variables accounted for 28% of the variance in positive and negative emotions at the outcome stage. Including grade, 57% of the variance in positive emotions at outcome and 61% of the negative emotions at outcome were explained.

The essence of stress, coping, and adaptation is change. The emotions one experiences in a stressful encounter, for example, are characterized by flux. At first one may feel anxious; after a few moments of further interchange, angry; then guilty; then loving and joyful. The sequence of feelings reflects the changing meaning or significance of what is happening as the encounter unfolds. Coping, too, is characterized by change. One might at first engage in avoidant or denial-like strategies to ward off the significance of an event, then decide to deal head-on with the problem; or at the stressful outset a person might cope by avoiding contact with others but a little later seek emotional support from a friend. Indeed, stress implies a disturbed person–environment relationship that coping is meant to change. Therefore, unless we focus on change we cannot learn how people come to manage stressful events and conditions.

To be concerned with change is to be concerned with process as opposed to structure. Structure refers to stable factors such as personality traits or static features of the environment. Even though the importance of

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process is recognized (e.g., Mechanic, 1962; Pearlin, Lieberman, Menaghan, & Mullan, 1981), research on stress and coping has tended to emphasize stable, structural properties of the person or the environment. Studies of coping, for instance, focus predominantly on coping traits (e.g., Goldstein, 1973; Krohne & Rogner, 1982; Moos, 1974). Similarly, social support, which is related to coping as a mediator or buffer between stress and health, is usually described in terms of the relatively stable size or character of one's social network, or how emotionally supported one generally feels (for review see Thoits, 1982). Structural approaches such as these do not provide information about whether and how a person actually copes, seeks or uses social support, or actually feels supported in a particular stressful encounter. Furthermore, structural approaches cannot reveal changes in stress-related phenomena, including emotion, as a specific encounter unfolds or from encounter to encounter.

The research to be reported here is designed to elicit information about two stress-related sets of processes: emotion and coping, including the use of social support. The setting is a naturalistic stress situation—a college midterm examination. Like many experimental situations and real-life events such as natural disasters and medical examinations (for reviews see Baker & Chapman, 1962; Lazarus, 1966; Thompson, 1981), a college midterm has three distinct stages: an *anticipatory stage* when the student must prepare for the exam under ambiguous conditions (i.e., not knowing exactly what it will be like or what the outcome will be); a *waiting stage,* which occurs after the exam has been given and before grades are announced; and an *outcome stage,* after learning how he or she has done. These stages and their concomitant demands are to a certain degree experienced uniformly by all students and to a certain degree differently. A midterm exam, with its three stages, is thus like a natural experiment with three conditions or treatments, and provides a good context for systematically observing process and change as a stressful encounter unfolds, from the perspective of both normative effects and individual differences.

The study of examination stress usually focuses on the student's anxiety, evaluated either as a trait or as a state, which summarizes the emotional distress a person experiences over the entire event (e.g., see Gaudry & Spielberger, 1971; Heinrich & Spielberger, 1982; Sarason, 1972, 1975). The goal of most such research is to evaluate the effects of anxiety on performance. Little attention is given to how anxiety or other emotions might increase and decrease throughout the examination or to the coping processes or changes in the environment that might mediate these changes. Although several recent studies have looked at anxiety during the anticipation or performance of an examination (Becker, 1982; Heckhausen, 1982), to our knowledge, with the exception of Mechanic (1962) and Epstein (1979, 1982), research has not been directed at changes in anxiety across these phases. Epstein (1962, 1982) has also examined changes in anxiety across time in research with sports parachutists (Fenz & Epstein, 1962). In addition, most studies of examination stress focus on normative effects *or* individual differences. The likelihood that stress processes comprises both socially shared and individual reaction patterns is generally ignored.

The present research, in contrast, looks at change during an examination, with attention given to both normative effects and individual differences. Although the setting of the research is a midterm exam, we see its principles as applicable to most stressful contexts, and we are therefore using it as a vehicle for a broader set of issues. In Part I of this article we examine changes in emotions, coping, and the use of social support from a normative perspective, by looking at how students as a group responded to the exam during the anticipatory stage, before the exam (Time 1); the waiting stage, after the exam and before grades were announced (Time 2); and the outcome stage, after grades were announced (Time 3). In Part II we turn our attention to the explanation of individual differences in response to the same stressful event. There we focus on emotion at the anticipatory stage (Time 1) and the outcome stage (Time 3) and, guided by our cognitive theory of stress and coping, which is described later, and taking ability and performance into account, analyze the extent to which individual differences in emotion can be explained by cognitive appraisal and coping.

The Theory of Stress and Coping

The theory on which this study is based has been developed by Lazarus and his colleagues over a number of years (Coyne & Lazarus, 1980; Lazarus, 1966, 1981; Lazarus, Averill, & Opton, 1974; Lazarus, Coyne, & Folkman, 1982; Lazarus & Folkman, 1984a, 1984b; Lazarus, Kanner, & Folkman, 1980; Lazarus & Launier, 1978). Within this framework, stress is defined as a relationship between the person and the environment that is appraised by the person as relevant to his or her well-being and in which the person's resources are taxed or exceeded.

Cognitive appraisal includes two component processes, primary and secondary appraisal. Through primary appraisal a person judges whether an encounter is irrelevant, benign–positive, or stressful. An irrelevant encounter has no significance for one's well-being, and the person has no stake in its outcome; in a benign–positive encounter only a good outcome is signaled; stressful appraisals are characterized by threat, challenge, or harm–loss. Threat refers to the potential for harm or loss; challenge refers to the potential for growth, mastery, or gain; and harm–loss refers to injury already done, as in harm to a friendship, health, or self-esteem. In secondary appraisal the person evaluates coping resources and options, addressing the question "What can I do?"

Primary and secondary appraisal processes operate interdependently. For example, if coping resources are adequate for dealing with a threat, the degree of threat is diminished. On the other hand, an event that at first might seem nonthreatening can become threatening if coping resources turn out to be inadequate for countering environmental demands or overcoming environmental or personal constraints.

Emotions are products of how people construe (appraise) their ongoing transactions with the environment. Emotions are thus of tremendous diagnostic value, because their intensity and quality reveal how people think they are managing what is important to them in any particular context. As a person's appraisals of a transaction change, so too will his or her emotions.

Coping refers to cognitive and behavioral efforts to manage (master, reduce, or tolerate) a troubled person–environment relationship. We view coping as having two major and widely recognized functions (see Folkman & Lazarus, 1980): the regulation of distressing emotions (emotion-focused coping) and doing something to change for the better the problem causing the distress (problem-focused coping). Folkman and Lazarus (1980) found that both functions of coping were represented in over 98% of the more than 1,300 stressful encounters that were reported by 100 middle-aged men and women over the course of a year. Problem-focused coping was used more frequently in encounters that were appraised by the person as changeable than in those appraised as unchangeable. In contrast, emotion-focused coping was used more frequently in encounters that were appraised as unchangeable than in those appraised as changeable. In subsequent analyses, a number of types of emotion-focused coping have been identified, including minimizing threat, seeking emotional support, wishful thinking, and self-blame (Aldwin, Folkman, Schaefer, Coyne, & Lazarus, 1980).

Research Design

Subjects were students in an undergraduate psychology course in stress, coping, and adaptation at the University of California, Berkeley, who were asked to participate in the study during class time as part of the course. Those who did not wish to participate could refuse. This was a nonrequired, lower-division course that attracted students from diverse fields as well as from psychology. Their classifications ranged from first-year student to senior. Only those who were taking the course for a letter grade (not pass–fail) were included in the analysis. Out of a total of 261 students, data were obtained from 189 subjects at Time 1, 140 at Time 2, and 136 at Time 3. One hundred and eight students completed all three assessments. These students were compared with those who did not complete all three assessments on GPA and on the grade they expected to receive in the exam, and the two groups did not differ. Subjects who did not complete all three assessments were therefore retained in the sample to maximize the n at each stage. Approximately 60% of the subjects at each assessment were female and 40% male. The

distribution of midterm grades reported by subjects at Time 3 suggests that, compared with the class as a whole, the sample was biased in favor of students who performed well (B or above). Specifically, of the grades given to the entire class, 50% were B or above and 50% C or below. Of the grades reported by subjects in the study, 70% were B or above and 30% were C or below.

Students were asked to complete a specially designed Stress Questionnaire in class on three occasions: two days before the midterm (Time 1), five days after the midterm and two days before grades were announced (Time 2), and five days after grades were announced (Time 3). The subjects were asked to describe their state of mind with respect to the examination at the time of each assessment. Thus, to the extent that these instructions were followed, the data for the three stages of the examination reflect appraisal, emotion, and coping at each stage. The questionnaire, which had been piloted in a preliminary study and revised for the present research, was designed to assess a number of psychological variables relevant to stress and coping in the examination, including cognitive appraisal, emotion, and coping (including use of social support) as well as GPA and the exam grade actually received. The items in the questionnaire will be described in greater detail with respect to each of the separate analyses reported in Part I and Part II.

Part I: Examination Stress Processes

Three variables are examined in Part I in normative fashion, that is, as group tendencies to react and change over the three stages of the examination. These variables include reported emotions, coping, and the use of social support at each stage, each measured by the Stress Questionnaire.

Emotion

From the perspective of a cognitive theory of emotion, the quality and intensity of any emotion—anxiety, jealousy, sorrow, joy, relief—is generated by its own particular appraisal (Beck, 1971; Ellis, 1962; Lazarus, Kanner, & Folkman, 1980; Lazarus & Launier, 1978; Weiner, Graham, & Chandler, 1982). For example, depending on the nature of an encounter and its appraised threat, a person might experience foreboding or worry. An appraisal of challenge might evoke eagerness or excitement. However, an appraisal of an encounter as harmful might elicit anger, disgust, disappointment, or sadness; and an appraisal of an outcome as positive (beneficial) might generate exhilaration, happiness, or relief. Findings from a preliminary pilot study with students in a different undergraduate psychology course and previously formulated theory (e.g., Lazarus et al., 1980), suggested that certain emotions were indicative of threat, challenge, harm, or benefit appraisals in an examination setting. These emotions are listed later in the description of the measures we used in this analysis.

The first question addressed in this section is whether or not emotions change from one stage to another during the process of an examination. According to our theoretical formulation, threat and challenge appraisals are anticipatory; they are evaluations of a potential harm or benefit, and deal with an upcoming event. We therefore expected emotions indicating challenge and threat to be experienced most intensely at the anticipatory stage (Time 1) and to decrease in intensity as the exam proceeded to the outcome stage (Time 3). Conversely, because harm and benefit appraisals are evaluations of an event that has already occurred, that is, they are outcome appraisals, we expected that emotions indicating harm and benefit would be least intense at Time 1 and become more intense as the likely outcome came into view.

The second issue explored here concerns the effects on emotion of changes in ambiguity or uncertainty. At Time 1 ambiguity is at its height; the student does not know exactly what will be on the exam or what the outcome will be. At Time 2 the student has already taken the exam and the ambiguity is reduced somewhat, although the grade is not yet known. Ambiguity is at its minimum at Time 3, when grades have been announced.

In situations that are highly ambiguous, it is difficult to evaluate what the likely outcomes will be. The person can see possibilities for both positive and negative outcomes (Folkman, Schaefer, & Lazarus, 1979), which means that both threat and challenge emotions are apt to be experienced. Therefore, regardless of the stage of an encounter, as long as the person makes appraisals about an

ambiguous future, he or she can experience both threat and challenge emotions.

In contrast to threat and challenge appraisals, which are anticipatory, harm and benefit appraisals primarily look backward; they are evaluations of what has already transpired. As an event unfolds and information is added, there is less ambiguity, and the significance of the encounter for well-being should become clearer. Thus, the more an encounter unfolds, the more firmly the person should be making either a negative (harm) or a positive (benefit) appraisal at the outcome (unless, of course, the encounter has multiple, conflicting outcomes, as when a person is given a promotion that involves an unwanted move, a condition we do not consider here). We hypothesized that during the highly ambiguous anticipatory stage (Time 1), the correlation between the emotions associated with harm and benefit appraisals would be low, reflecting the high degree of uncertainty about the outcome and how the students felt. We expected that the correlation would become increasingly negative as they learned more about the outcome, and reach its greatest magnitude at Time 3, after grades were announced and it became clear whether they had done well or badly.

Method

As part of the Stress Questionnaire, subjects were asked to indicate on a 5-point Likert scale (0 = not at all; 4 = a great deal) the extent to which they felt each of the following 15 emotions, which are grouped here into their appraisal categories:

Anticipatory:
1. Threat emotions—worried, fearful, and anxious;
2. Challenge emotions—confident, hopeful, and eager;

Outcome:
1. Harm emotions—angry, sad, disappointed, guilty, and disgusted;
2. Benefit (mastery–gain) emotions—exhilarated, pleased, happy, and relieved.

Scales were scored by summing the ratings for each item. The reliabilities for each of these rationally devised scales were calculated for each of the three administrations. The mean alpha for the threat emotions scale was .80; .59 for the challenge emotions scale; .84 for the harm emotions scale; and .78 for the benefit emotions scale. The relatively low reliability of the challenge scale suggests that findings with respect to challenge should be interpreted cautiously.

Results

The first step in the analysis was to examine changes in the four emotions scales from Time 1 to Time 2, and from Time 2 to Time 3. Differences in emotions were examined with paired t tests. To reduce the chance of a Type I error, an experiment-wise error rate of .10 was used for the two sets of tests (Time 1 vs. Time 2 and Time 2 vs. Time 3), meaning that a t value had to have a probability of $\leq .01$ to be considered significant. The results are shown in Table 1.

The intensity of threat and challenge emotions did not change significantly from Time 1 to Time 2, but decreased significantly from Time 2 to Time 3. Harm and benefit emotions, in contrast, increased significantly from Time 1 to Time 2, but did not change from Time 2 to Time 3.

The second step was to examine the relations between threat and challenge emotions, and harm and benefit emotions, across stages. At Time 1, 94% of the subjects reported both threat and challenge emotions (that is, they had a score of 1 or greater on the threat and challenge emotions scales), confirming our prediction that under conditions of maximum ambiguity people are likely to experience both threat and challenge. Threat and challenge emotions were not significantly related at Time 1 ($r = -.05$), Time 2 ($r = .03$), or Time 3 ($r = -.15$).

There was no relation between harm and benefit emotions at Time 1 ($r = .08$). At Time 2, however, the correlation was $-.25$ ($p = .003$) and at Time 3, $-.50$ ($p < .001$). The relation between harm and benefit emotions, or negative and positive outcome emotions, thus increased in magnitude in the expected direction as the encounter unfolded.[1]

[1] The pattern of increasingly negative correlations between positive and negative outcome emotions is consistent with findings from the preliminary pilot study with students in a different undergraduate psychology course mentioned earlier. Subjects described a recently experienced stressful event of their own choosing, whether ongoing or concluded. In the case of ongoing events, subjects reported the extent to which they were currently experiencing positive and negative emotions in relation to that event, and in the case of concluded events, reported how they felt when the event was over. The timing of the assessment of emotions in ongoing events is analogous to Time 2 in the present study in that the event had begun and was not yet over. Similarly, the timing of the assessment for concluded events, for which the outcome was known, is analogous to Time 3 in the present study. Despite differences in the two studies (e.g., in the pilot study a wide variety of stressful events was reported; distinctions between anticipatory and outcome

Table 1
Changes in Emotion from Time 1 to Time 2 and Time 2 to Time 3

Variable	Number of cases	Time	*M*	*t* value	*df*	2-tailed probability
Threat emotions	129	Time 1	5.0	2.19	128	.030
	107	Time 2	4.4 (4.5)	9.34	106	<.001
		Time 3	1.8			
Challenge emotions	127	Time 1	4.9	.40	126	.686
	105	Time 2	4.8	4.54	104	<.001
		Time 3	3.4			
Harm emotions	122	Time 1	2.1	−2.79	121	.006
	102	Time 2	3.1	−1.36	101	.178
		Time 3	3.8			
Benefit emotions	129	Time 1	1.7	−9.41	128	<.001
	105	Time 2	4.7 (4.8)	−1.72	104	.089
		Time 3	5.6			

Note. The mean for Time 2 that was calculated for the second comparison (Time 2 with Time 3) is indicated in parentheses if it differed from the mean calculated for the first comparison (Time 1 with Time 2).

Discussion

There were significant changes in the four types of emotions as the examination unfolded. Threat and challenge emotions were elevated at Times 1 and 2 and dropped significantly at Time 3; harm and benefit emotions rose significantly from Time 1 to Time 2 and remained elevated at Time 3. During the waiting period (Time 2) there was substantial engagement of both threat and challenge emotions, and harm and benefit emotions. During this waiting stage the students had already taken the exam and may have had some clues as to how they had performed, but until the grades were announced they could not know clearly how they had done, especially when, as in this case, the instructor graded on a curve. Time 2 is thus not distinctly an anticipatory or an outcome stage, but a combination of both, which may explain why the emotions associated with both anticipation and outcome were elevated.

The significant changes in emotions that occurred as the examination unfolded are consistent with our theoretical position that as the person's appraisal of a stressful encounter changes, so too will its associated emotions. As noted earlier, in the anticipatory stage, people are concerned with evaluating the demands and possibilities connected with a future event; at the outcome stage, their concerns turn to the significance of what has already happened. In this study, anticipation concerns how one might do on the exam and what must be done to prepare for it and/or to regulate feelings; outcome concerns one's performance and its implications. One might be disappointed or pleased about the examination after the grade has been announced; however, such feelings are not relevant before the exam. Conversely, one is more likely to be worried and/or hopeful before the exam than after.

Notice what would happen if a person's emotions for the whole stressful encounter were aggregated and represented by a single summary state score. The aggregate would contain a mixture of emotions whose situational and cognitive bases would in all likelihood be ignored. Furthermore, changes in the emotional state, reflecting changes in the

emotions were not made; the data in the concluded events were retrospective; and the two stages were elicited in connection with different encounters rather than referring to different stages of the same encounter), the same pattern of increasing negative correlations was found. Positive and negative emotions at the ongoing stage (analogous to Time 2) were correlated −.21, and in the concluded stage (analogous to Time 3) the correlation was −.40. Thus, the results can be said to have been replicated in the present study. However, what is perhaps even more important, having subjects recall how they felt at an earlier stage (pilot study) produced findings comparable to having them report feelings at the present moment.

person–environment relationship during the examination, would be entirely masked. In other words, a summary score would misrepresent how the person was actually feeling throughout the encounter and would bury important indicators of the person's ongoing evaluations of how well he or she was managing the demands of a stressful encounter.

With respect to the role of ambiguity, we suggested that the greater the ambiguity, the greater the probability that people would experience both positive and negative emotions at the same time. Conversely, as ambiguity gives way to clarity, people will be more likely to experience either positive or negative emotions. Our findings offer strong support for this line of reasoning. Threat and challenge emotions, which reflect anticipatory appraisals in an ambiguous context, were not significantly correlated at Time 1, Time 2, or Time 3. In contrast, positive and negative outcome emotions, that is, benefit and harm emotions, which reflect appraisals about what has already transpired, became increasingly negatively correlated at the encounter unfolded to its conclusion. The important point is that when anticipating an ambiguous outcome, people are likely to feel both positive (challenge) emotions and negative (threat) emotions, whereas when evaluating an outcome that has clearly transpired, they are likely to feel either positive (benefit) emotions or negative (harm) emotions.

Notice too what this says about analyses of the dimensions of emotions (e.g., Daly, Polivy, & Lancee, 1983; Russell, 1980; Watson, Clark, & Tellegen, 1984). Most dimensional analyses, which correlate and factor-analyze ratings of emotion, are based on the emotional responses to specific and relatively unambiguous events. The contexts of these ratings therefore correspond to our outcome stage when the implications of the encounter are relatively unequivocal. Under these circumstances we would expect positive and negative emotional states such as relief and disappointment, or happiness and sadness, to display strong negative relations. But when encounters producing emotions are ambiguous as to outcome—a common experience in living—the expected negative relations and the clear dimensional structures based on them would probably not be found.

The pattern described above can also be thought of as the microgenesis of a cognitive–affective structure, after the classic European work on the microgenesis of perception. A person probably has many such structures, some transitory, some stable, each reflecting particular areas of experience. When these structures repeat themselves, they can operate in the same manner as beliefs, by affecting subsequent perceptions and emotional patterns. In the present instance, a subject's emergent cognitive–affective structure is probably specific to the examination outcome and its implications; it may be transitory, but it may also reintegrate similar experiences and reemerge when the person faces another examination. Its stability can only be evaluated by observing the same cognitive–affective process again in the same persons. Our use of the examination setting made it possible for us to observe the evolution of a specific cognitive–affective structure from its genesis in an ambiguous condition to its articulation through substantial cognitive and hence emotional clarity.

Coping

We noted in the introduction that the dominant approach to the measurement of coping has been to assess coping as a trait, that is, as a stable person property that affects actions and reactions under a variety of stressful circumstances. Yet coping traits are often poor predictors of the ways people actually cope in a specific context (for reviews see Cohen & Lazarus, 1973; Folkman & Lazarus, 1980; Lazarus & Launier, 1978). The power of trait measures to predict coping processes is limited because, by definition, they are concerned with person characteristics that transcend situational characteristics whose properties are apt to produce variability rather than stability in how people cope (e.g., Krohne & Rogner, 1982).

Three criteria must be satisfied to study coping as a process: (a) Coping must be examined within the context of a specific stressful encounter; (b) what the person actually does (as contrasted to what the person usually does, or would do, which is asked by the trait approach) must be described; and (c) there must be multiple assessments during

the encounter in order to examine changes in coping over time as the encounter unfolds. In an earlier effort to move toward a process approach to coping (Folkman & Lazarus, 1980), we studied coping thoughts and actions in the same people over numerous stressful encounters, thereby meeting criteria (a) and (b). We found changes in coping from encounter to encounter, but we were not in a position to evaluate how coping changes during the course of a single encounter. These three criteria of process were met in the present research by evaluating what the students actually did (as reported by them) to cope with the particular stressful transaction at three points in time.

Method

Coping was assessed with the Ways of Coping Checklist, which is a modification of the 68-item list reported by Folkman and Lazarus (1980) and Aldwin et al. (1980). The revised 66-item self-report measure retains the broad range of cognitive and behavioral strategies people use to manage stressful demands. However, the response format has been changed from a *yes–no* answer to a 4-point Likert scale (0 = does not apply and/or not used; 3 = used a great deal). Redundant and unclear items have been deleted or reworded, and several items, such as prayer, were added at the suggestion of subjects in our previous research. The checklist was administered in the present study as part of the Stress Questionnaire at Time 1, Time 2, and Time 3.

A three-step procedure was used to develop scales from the revised checklist. First, 9 items were eliminated because they showed high skewness and restricted variance. The remaining 57 items were then factor-analyzed. Only those subjects who completed the series of three questionnaires were included in the factor analysis in order to avoid overrepresentation in the factor structure of the Time 1 questionnaires, which were returned in greater number than those at Times 2 and 3. Thus, the sample for the factor analysis consisted of three questionnaires from each of 108 subjects, yielding an N of 324.[2]

A six-factor solution, using common factor analyses with oblique rotation, yielded the most conceptually interpretable set of factors. Fifteen items that did not load clearly on any one factor were deleted. One of the six factors contained three distinguishable groups of emotion-focused items. Thus, in the final step, the three groups of items were rationally assigned to three factors to provide greater theoretical clarity.

This procedure produced eight scales, including one problem-focused and six emotion-focused scales, and the eighth scale containing both problem- and emotion-focused items. These eight scales are characterized as follows:

Problem-focused coping (11 items): e.g., "I try to analyze the problem in order to understand it better"; "I'm making a plan of action and following it";

Emotion-focused coping:

Wishful thinking (5 items): e.g., "Wish that I can change what is happening or how I feel"; "Wish that the situation would go away or somehow be over with";

Distancing (6 items): e.g., "Try to forget the whole thing"; "I'm waiting to see what will happen before doing anything";

Emphasizing the positive (4 items): e.g., "Look for the silver lining, so to speak; try to look on the bright side of things"; "I'm changing or growing as a person in a good way";

Self-blame (3 items): e.g., "Criticize or lecture myself"; "Realize I brought the problem on myself";

Tension-reduction (3 items): e.g., "Try to make myself feel better by eating, drinking, smoking, using drugs or medications, etc"; "I jog or exercise";

Self-isolation (3 items): e.g., "Avoid being with people in general"; "Keep others from knowing how bad things are";

Mixed problem- and emotion-focused coping:

Seeking social support (7 items): e.g., "Talk to someone to find out more about the situation"; "Accept sympathy and understanding from someone."

Scores were calculated by summing the ratings. The average reliabilities and intercorrelations among the eight scales are shown in Table 2. The intercorrelations among the scales averaged across three occasions are similar to those reported by Aldwin et al. (1980).[3]

Results

Our first objective was to confirm our previous finding that people typically use both problem- and emotion-focused forms of coping rather than just one form or the other. At Time 1, the period prior to the midterm exam, 99% of the subjects used problem-focused coping (that is, had a score of 1 or

[2] The factor analysis could also have been performed separately for each occasion, or with scores averaged across the three occasions for each subject, which would have had the advantage of providing independent observations. However, we wanted a common metric with which to compare coping on the three occasions based on as large a sample size as possible. For this reason, we decided to pool observations across the three occasions, even though this involved dependence in the data.

[3] The above eight scales are similar in content to those found in an earlier analysis (Aldwin et al., 1980). Problem-focused coping, wishful thinking, self-blame, and emphasizing the positive (previously called growth coping) have similar items in both versions. The earlier version had a help-seeking/avoidant scale. The help-seeking component has its counterpart in the present social support scale. The previous version also contained aminimization of threat scale, which resembles the present distancing scale. Separate scales called tension-reduction and self-isolation have been added.

Table 2
Reliabilities and Intercorrelations of Coping Scales Averaged Across Three Occasions

Scale	α	Measure 1	2	3	4	5	6	7	8
1. Problem-focused coping	.85		.41	.20	.64	.58	.46	.38	.31
2. Wishful thinking	.84			.51	.42	.29	.63	.50	.54
3. Distancing	.71				.24	.13	.34	.34	.41
4. Seeking social support	.81					.54	.39	.42	.18
5. Emphasizing the positive	.65						.42	.36	.23
6. Self-blame	.75							.31	.53
7. Tension-reduction	.56								.37
8. Self-isolation	.65								

greater on the problem-focused scale) and at least one form of emotion-focused coping (a score of 1 or greater on at least one emotion-focused scale). At Time 2, 95% used both forms of coping, and at Time 3, 94%. An inspection of the range of coping strategies used at each occasion gives further evidence of the multidimensionality of coping. A maximum of eight types of coping were available to the subjects at each occasion. At Time 1 subjects used an average of 7 types of coping; at Time 2, 6.5; and at Time 3, 6.2.

Our second objective was to examine changes in the eight types of coping from Time 1 to Time 2, and from Time 2 to Time 3. This was done using paired t tests. An experiment-wise error rate of .10 was used for the two sets of tests (Time 1 vs. Time 2 and Time 2 vs. Time 3), meaning that to attain significance, a t value had to have a probability of $\leq .006$. The results are shown in Table 3.

Problem-focused coping, seeking social support, emphasizing the positive, and self-isolation decreased significantly from Time 1 to Time 2, whereas distancing increased significantly. Wishful thinking and distancing decreased significantly from Time 2 to Time 3.

There was no significant increase in any type of coping from Time 2 to Time 3. This finding suggested that the coping tasks at Time 3 may have been determined more by individual differences in reaction to the outcome (grades) than by consensually perceived demands. We followed up this possibility by examining the effects on coping of the grade received in the examination. Using analysis of variance (ANOVA) with grade (A, B, C) as the independent variable, and the eight coping scales as the dependent variables, we found significant effects for five of the eight types of coping: wishful thinking, $F(2, 117) = 9.32$, $p < .001$; seeking social support $F(2, 118) = 3.01$, $p < .05$; self-blame, $F(2, 119) = 13.89$, $p < .001$; tension-reduction, $F(2, 118) = 6.09$, $p < .003$; and self-isolation, $F(2, 120) = 12.14$, $p < .001$. In every case, the pattern of the effect was the same: The means on the coping scales increased as the grades decreased.

Discussion

That at least 94% of the subjects used both problem- and emotion-focused forms of coping at each of the three stages confirms our previous finding that both functions of coping are represented in most stressful encounters. The complexity of the ways people cope is especially evident in the wide range of coping strategies used at each stage. On the average, subjects used between six and seven different types of coping. People do indeed cope with a single stressful encounter in complex ways.

The changes in coping from Time 1 to Time 2, and Time 2 to Time 3, demonstrate that coping changes as a stressful encounter unfolds. The changes from Time 1 to Time 2 in particular reflect a normative response to changes in the obvious situational demands from one phase of the examination to another. Problem-focused coping was at its height at Time 1, presumably in the service of studying for the exam. Two forms of emotion-focused coping, emphasizing the positive and seeking social support, were also at their height at Time 1.

The most dramatic shift from Time 1 to Time 2 was a large decrease in problem-focused coping, $t = 11.36$, $p < .001$. Nothing more could be done to change the outcome of the exam at Time 2, which probably accounts for this drop. Seeking social support and emphasizing the positive also decreased significantly. The second most dramatic shift was a large increase in distancing, which peaked at Time 2. That distancing was significantly elevated at this stage suggests that it is used especially in contexts where there is nothing to do but wait.

Two types of coping decreased significantly from Time 2 to Time 3, namely, wishful thinking and distancing. The decrease in distancing is especially marked and is consistent with the idea that this form of coping is used particularly in waiting for an outcome, when problem-focused coping has no useful function. The absence of a significant increase in any type of coping from Time 2 to Time 3 suggests that no one situational demand was experienced by the group as a whole after grades were announced. Instead, as indicated by the follow-up analysis in which the effects of grade on coping were examined, coping at Time 3 was influenced by individual differences in grades. The students who received poorer grades reported using more emotion-focused forms of coping, presumably in an effort to manage distress concerning their disappointing performance, than students who did well.

Elsewhere we have argued that emotion-focused modes of coping can facilitate problem-focused coping if they are used to manage emotions that would otherwise impede problem-focused activity (Lazarus & Folkman, 1984a, 1984b). In the present study, problem-

Table 3
Changes in Coping from Time 1 to Time 2 and Time 2 to Time 3

Variable	Number of cases	Time	*M*	*t* value	*df*	2-tailed probability
Problem-focused coping	123	Time 1	15.2	11.36	122	<.001
	100	Time 2	9.5 (9.7)	−2.00	99	.049
		Time 3	10.5			
Wishful thinking	124	Time 1	5.2	2.15	123	.034
	103	Time 2	4.6	4.76	102	<.001
		Time 3	3.9			
Distancing	125	Time 1	3.5	−9.28	124	<.001
	105	Time 2	6.5 (6.3)	8.55	104	<.001
		Time 3	3.6			
Seeking social support	123	Time 1	7.0	6.18	122	<.001
	103	Time 2	5.1	2.22	102	.029
		Time 3	4.4			
Emphasizing the positive	126	Time 1	4.2	3.90	125	<.001
	102	Time 2	3.3 (3.2)	1.69	101	.094
		Time 3	2.8			
Self-blame	130	Time 1	3.3	.92	129	.362
	104	Time 2	3.2	−.36	103	.723
		Time 3	3.2			
Tension-reduction	126	Time 1	2.6	1.94	125	.054
	104	Time 2	2.3	2.17	103	.033
		Time 3	2.0			
Self-isolation	128	Time 1	2.3	2.97	127	.004
	104	Time 2	1.9 (2.0)	2.70	103	.008
		Time 3	1.6			

Note. The mean for Time 2 that was calculated for the second comparison (Time 2 with Time 3) is indicated in parentheses if it differed from the mean calculated for the first comparison (Time 1 with Time 2).

focused coping was strongly correlated with emphasizing the positive and seeking social support. The correlation between seeking social support and problem-focused coping averaged across three occasions was .64. This correlation may be due in part to the problem-focused strategies for seeking informational support, which are on the scale that measures seeking social support. The correlation between problem-focused coping and emphasizing the positive, however, was .58 averaged across three occasions, which suggests that the latter form of emotion-focused coping goes hand-in-hand with problem-focused coping.

Social Support

A person's social network or social support system can be viewed as a coping resource, to be cultivated, maintained, and used or not used in many different ways. This resource can be drawn upon for emotional support, which contributes to the feeling that one is loved or cared about; for tangible support, which involves direct assistance in terms of service or material goods; and for informational support, which includes information and advice (Schaefer, Coyne, & Lazarus, 1982). The type of support that is used should be determined in part by the demands of the situation. For example, with respect to the examination stages, we expected that subjects would seek informational support to help them with preparations for the exam at Time 1, and shift to emotional support for reassurance during the waiting period (Time 2) and for comfort after grades were announced (Time 3). Thus, informational support should be used more extensively before the exam than afterwards, whereas emotional support should be used more after the exam than before. We had no basis for predicting how tangible support, which seems least relevant, might be used.

Method

Questions about social support were posed at Time 1, Time 2, and Time 3 as part of the Stress Questionnaire. Subjects were asked to think of all the people they had spoken with at each stage of the exam and to indicate on a checklist which person was most helpful (e.g., a fellow student taking the course, a friend outside the course, a teaching assistant, the professor, a family member, no one). The subject was then asked three questions about the most helpful person. Responses were made on a 5-point Likert scale (1 = not at all; 5 = extremely). The questions were:

> How much had this person: (1) given you information, suggestions and guidance? (2) given you tangible assistance (e.g., helped you with chores, errands, etc.)? (3) given you emotional support (e.g., boosted your spirits, made you feel he/she cares)?

Results

Seventy-one percent of the students indicated that someone was helpful at Time 1, 50% at Time 2, and 44% at Time 3. This finding indicates that the provision of help decreased over the three stages. There is, unfortunately, no way to know whether subjects who found no one helpful were unable to obtain support or whether they simply did not desire it.

Changes in the type of support that was used from Time 1 to Time 2 and From Time 2 to Time 3 were examined with paired t tests. An experiment-wise error rate of .10 was used for the two sets of tests (Time 1 vs. Time 2 and Time 2 vs. Time 3), meaning that a t value had to have a probability of .017 to be considered significant. The results are shown in Table 4.

As predicted, there was a significant decrease in informational support, and a significant increase in emotional support, from Time 1 to Time 2. No significant changes were found from Time 2 to Time 3. Tangible support did not show any significant changes.

Discussion

These findings, consistent with our expectations, strongly suggest that the kind of social support people use is to a large extent determined by the demands of the stressful encounter and by changes in these demands as it unfolds. Informational support was more commonly used before the exam, when the situational demands called for preparation for a specific task (i.e., the exam), and emotional support was more frequently used after the exam, when there was nothing more that could be done about the task and all that remained was to deal with the outcome of the exam. The lack of change in the use of tangible support indicates that no one phase of the examination called for tangible assis-

Table 4
Changes in Social Support from Time 1 to Time 2 and Time 2 to Time 3

Variable	Number of cases	Time	*M*	*t* value	*df*	2-tailed probability
Informational support	41	Time 1	3.4	5.42	40	<.001
	29	Time 2	2.2	.53	28	.602
		Time 3	2.1			
Emotional support	43	Time 1	2.2	−.39	42	<.001
	30	Time 2	3.1	.30	29	.769
		Time 3	3.1			
Tangible support	40	Time 1	1.5	−.28	39	.781
	27	Time 2	1.5	.66	26	.515
		Time 3	1.4			

tance more than any other. In fact, the relatively low level of tangible support that was reported throughout the examination suggests that there was little perceived value in this kind of social support in the context of the examination. Because we only asked about the most helpful person at each time point, we do not know whether subjects received alternative kinds of support from other people at each occasion.

Our findings indicate that it is important to think of the use of social support as a coping *process* that changes over time in accord with shifts in a specific person–environment relation. This view does not negate the importance of also looking at social support as an antecedent of long-term health outcomes, which is the more traditional formulation (e.g., Cobb, 1976). Having a social support system, for example, whether or not one draws on it, may contribute to whether a person feels generally challenged or threatened, or committed rather than alienated, which in turn may be related to health (Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982). Clearly, however, how people draw on available support in specific stressful encounters should also be systematically studied, because it varies with the particular context.

Part II: Individual Differences in Emotion

Despite the strong main effects of the examination stages on emotion shown in Part I, there were also large individual differences. According to our theoretical formulation, individual differences in emotion in a stressful encounter are due in large part to cognitive appraisal and coping. In Part II we draw on this theoretical formulation in order to explain individual differences in emotions at Time 1 and Time 3.

Threat and Challenge Emotions (Time 1)

According to our theoretical framework, a transaction is appraised as stressful only if the situation engages a significant motive, that is, the person judges that something is at stake (Lazarus, 1966). In other words, having a stake in the outcome is a necessary (but not sufficient) condition for threat and challenge. The greater the stake, the higher the potential for emotion in the encounter. We therefore predicted that both threat and challenge emotions would be associated with the level of personal stakes.

Whether or not a transaction is stressful is also influenced by an evaluation of coping resources (Lazarus, 1966), which we call *secondary appraisal.* Secondary appraisal in this study was assessed by questions about how difficult the student expected the exam to be and how much in control he or she was feeling. Grade point average was also included in the assessment of secondary appraisal, as an indicator of relevant skills and abilities. These variables provided the basis for predicting: (a) the more difficult the person anticipates the exam will be, the higher the threat emotions; (b) the more in control the person feels, the higher the challenge emotions and, conversely, the less in control the person feels, the higher the threat emotions (cf.

reviews in Silver & Wortman, 1980; Thompson, 1981); and (c) the better the subject's prior academic performance (GPA), the higher the challenge emotions, and the worse the prior performance, the higher the threat emotions.

The conceptual bases for predicting relations between coping and threat and challenge emotions are less clear. Emphasizing the positive aspects of the examination should decrease threat emotions and perhaps increase challenge emotions. We made no other predictions about threat and challenge from any of the other types of coping.

Harm and Benefit Emotions (Time 3)

The grade a student receives should have a strong influence at the outcome of the examination. The higher the grade, the better the person should feel about the exam and, conversely, the lower the grade, the worse he or she should feel. However, a central tenet of our conceptualization is that the meaning of the outcome to the individual and the way it is handled (coped with) is a key factor in emotion. Therefore, we would expect appraisal and coping processes to contribute to individual differences in harm and benefit emotions over and above the differences explained by the grade itself.

The same variables shaping appraisal and emotion in the anticipatory phase of the examination should also be relevant at the outcome. For example, the more the student has at stake in the exam, the greater the significance of the grade. Thus, we would expect this variable to contribute to both harm and benefit emotions.

Perceived difficulty of the exam could have different effects on harm and benefit emotions than on threat and challenge emotions. On the one hand, difficulty attributed to internal factors such as lack of ability and/or effort could result in harm emotions; yet if the difficulty is attributed externally to the task itself, for example, "The exam was *unusually* difficult," the way is open for the person to rationalize his or her performance and hence reduce feelings of guilt or disappointment (cf. Meyer, 1980; Weiner, Russell, & Lerman, 1979). Because we did not obtain the information on attributions that is needed to interpret the personal meaning of this variable, we could not make any predictions about its role.

The extent to which a student felt in control should operate in the same way with respect to harm and benefit emotions as is postulated for threat and challenge emotions, in effect, by raising the intensity of positive emotions when feelings of control are high, and raising the intensity of negative emotions when such feelings are low.

There are no compelling theoretical or empirical bases for predicting the relations between specific types of coping and harm and benefit emotions. However, intuitively we expected that emphasizing the positive would be associated with benefit emotions and self-blame with harm emotions. We made no predictions regarding the remaining six types of coping.

Method

Stakes were measured with a 4-item scale administered at Time 1 as part of the Stress Questionnaire. The student was asked to respond on a 5-point Likert scale (0 = does not apply; 4 = applies a great deal) to the following question:

> Below is a list of reasons why exams can be stressful. Please indicate how much each item applies to you by circling the appropriate number. In this exam there is the possibility of:
> (a) not achieving the grade I want
> (b) appearing incompetent to others
> (c) jeopardizing my view of myself as a capable student
> (d) losing the approval or respect of someone important to me.

Two other items ("jeopardizing eligibility for scholarship, fellowship, or financial assistance" and "harm to my physical health") were not included in the analysis, because they were infrequently endorsed. The scale was scored by summing the ratings on the four items. The reliability (alpha) of the four-item stakes scale was .78.

Difficulty was assessed with the following items:

(Time 1): How difficult do you think this exam will be?

(Time 3): How difficult did you find the exam?

Responses were reported on a 5-point Likert scale (1 = not at all difficult; 5 = extremely difficult).

How much in control the subject felt was assessed at Time 1 and Time 3 by asking the subject to indicate how much in control he or she was feeling "*now* about this exam." The response was indicated on a 5-point Likert scale (0 = *not at all;* 4 = *a great deal*).

GPA was reported by the subjects at Time 1 and Time 3.

Grade received on the exam was reported by the subjects at Time 3. Grades were indicated by letter (A, B, C, D, or F).

Table 5
Correlations Among Predictors of Threat and Challenge Emotions

Measure	Measure											
	1	2	3	4	5	6	7	8	9	10	11	12
1. GPA		−.07	−.17	.18	−.01	−.22	−.33	−.15	−.02	−.22	−.09	−.21
2. Stakes			.30	−.15	.20	.33	.20	.27	.07	.29	.22	.23
3. Difficulty				−.47	.01	.28	.19	.08	−.10	.23	.08	.20
4. Feeling in control					.20	−.29	−.15	.06	.16	−.23	−.09	−.13
5. Problem-focused coping						.33	.14	.56	.51	.33	.35	.22
6. Wishful thinking							.55	.33	.16	.65	.47	.40
7. Distancing								.20	.11	.41	.34	.45
8. Seeking social support									.42	.29	.45	.07
9. Emphasizing the positive										.30	.35	.19
10. Self-blame											.36	.52
11. Tension-reduction												.21
12. Self-isolation												

The eight coping scales and the four emotion scales (threat and challenge emotions; harm and benefit emotions) were described in Part I.

Results

Threat and challenge emotions (Time 1). GPA, stakes, anticipated difficulty of the exam, feeling in control, and the eight coping scales were used to explain the variance in threat and challenge emotions. The zero-order correlations among the predictor variables are shown in Table 5. These variables were entered into a regression equation in a forward stepwise procedure. The results of the regression analysis for threat emotions are shown in Table 6 and for challenge emotions in Table 7.

In all, 48% of the variance in threat emotions was explained. Wishful thinking, stakes, anticipated difficulty of the exam, and seeking social support accounted for 44% of the variance. The standardized regression coefficients for these variables were all positive, as expected. An additional 4% was explained by the remaining coping scales, feeling in control, and GPA.

Approximately 48% of the variance in challenge emotions was also explained, although a somewhat different pattern of variables was evident than for threat. Feeling in control, stakes, problem-focused coping, and tension-reduction accounted for 44% of the variance. One of these variables, tension-reduction, had a negative Beta coefficient.

Table 6
Regression of Threat Emotions on Appraisal, Coping, and GPA

Variable	R^2	R^2 change	β^a
Wishful thinking	.23	.23	.31*
Stakes	.35	.12	.26*
Anticipated difficulty of exam	.41	.06	.21*
Seeking social support	.44	.03	.19*
Distancing	.46	.02	−.13
Feeling in control	.47	.01	−.15
Tension-reduction	.48	.01	−.07
Self-blame	.48	.00	.08
GPA	.48	.00	.03
Problem-focused coping	.48	.00	.04
Emphasizing the positive	.48	.00	−.03
Self-isolation	.48	.00	−.02

[a] Standardized regression coefficient
* $p \leq .05$.

Table 7
Regression of Challenge Emotions on Appraisal, Coping, and GPA

Variable	R^2	R^2 change	β^a
Feeling in control	.35	.35	.63*
Problem-focused coping	.40	.05	.16*
Stakes	.42	.02	.14*
Self-isolation	.44	.02	−.15*
Wishful thinking	.45	.01	.19*
Anticipated difficulty of exam	.46	.01	.12
Emphasizing the positive	.47	.01	.10
Seeking social support	.47	.00	−.10
Distancing	.47	.00	−.07
GPA	.48	.00	.05
Tension-reduction	.48	.00	.04

[a] Standardized regression coefficient
* $p \leq .05$

The remaining coping scales, perceived difficulty, and GPA accounted for an additional 4%.

Harm and benefit emotions (Time 3). A combination of hierarchical and forward stepwise regression analyses was used to predict the variance in harm and benefit emotions. The grade received on the exam was entered into the equations first because we viewed it as the precipitator of appraisal and coping processes at Time 3. The remaining variables were entered in a forward stepwise procedure. The predictor variables thus include grade received (entered first) and stakes, feeling in control, perceived difficulty of the exam, and the eight coping scales. The zero-order corerlations among these variables are shown in Table 8. The results of the regression analysis for harm emotions are shown in Table 9 and for benefit emotions in Table 10.

Sixty-one percent of the variance in harm emotions was explained by these variables. Grade on the exam accounted for 37%, and three types of coping—self-blame, wishful thinking, and seeking social support—accounted for an additional 20%. The remaining 4% was explained by the appraisal variables and five remaining types of coping. The regression coefficient for grade on the exam was negative, as expected. The regression coefficient for seeking social support was also negative, although not significant.

Fifty-seven percent of the variance in benefit emotions was accounted for. Grade on the exam accounted for 33% of the variance. An additional 24% was accounted for by the

Table 8
Correlations Among Predictors of Harm and Benefit Emotions

	Measure											
Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Grade on exam		−.05	−.36	.47	−.19	−.37	−.13	−.22	−.11	−.43	−.25	−.39
2. Stakes			.31	.09	.25	.31	.14	.23	.10	.38	.07	.07
3. Difficulty				−.16	.18	.38	.19	.18	.05	.30	.32	.31
4. Feeling in control					.16	−.28	−.18	.03	.20	−.21	−.10	−.25
5. Problem-focused coping						.48	.30	.71	.59	.57	.41	.41
6. Wishful thinking							.57	.43	.30	.62	.50	.61
7. Distancing								.26	.10	.37	.38	.47
8. Seeking social support									.59	.44	.41	.24
9. Emphasizing the positive										.42	.38	.27
10. Self-blame											.31	.54
11. Tension-reduction												.48
12. Self-isolation												

Table 9
Regression of Harm Emotions on Grade, Appraisal, and Coping

Variable	R^2	R^2 change	β^a
Grade	.37	.37	−.28*
Self-blame	.52	.15	.41*
Wishful thinking	.55	.03	.27*
Seeking social support	.57	.02	−.17
Stakes	.58	.01	−.13
Perceived difficulty of exam	.59	.01	.13
Feeling in control	.60	.01	−.11
Distancing	.61	.01	−.09
Tension-reduction	.61	.00	.05
Emphasizing the positive	.61	.00	−.05
Problem-focused coping	.61	.00	.06
Self-isolation	.61	.00	−.03

[a] standardized regression coefficient
* $p \leq .05$

appraisal variables and coping, with seeking social support, feeling in control, self-isolation, and stakes accounting for 20%.

A second set of regression analyses was done for harm and benefit emotions, which employed only the forward stepwise procedure. We were interested in determining where grade on the exam would be entered into the equation according to strictly empirical criteria. The equation for benefit emotions using the forward stepwise procedure was identical to the hierarchical and forward stepwise regression shown in Table 10. Grade on the exam still accounted for the major proportion of variance in benefit emotions. In contrast, the resulting equation for harm emotions showed that self-blame was entered first, accounting for 39% of the variance, followed by grade on exam, accounting for an additional 13%.

Discussion

In order to simplify the discussion of the above findings, we shall confine ourselves to those variables that together account for 90% of the explained variance in each of the four sets of emotions. These variables are shown in Table 11.

Threat and challenge emotions (Time 1). Three important points emerge from the findings on threat and challenge emotions. First, GPA is notably absent as an important explanatory variable; the emotions experienced during the preparation for an exam

Table 10
Regression of Benefit Emotions on Grade, Appraisal, and Coping

Variable	R^2	R^2 change	β^a
Grade	.33	.33	.52*
Seeking social support	.44	.11	.20
Feeling in control	.49	.05	.23*
Tension-reduction	.52	.03	.14
Stakes	.53	.01	.17*
Self-blame	.54	.01	−.17
Distancing	.55	.01	.13
Emphasizing the positive	.55	.00	.13
Perceived difficulty of exam	.56	.01	.09
Wishful thinking	.56	.00	−.13
Self-isolation	.57	.01	.04
Problem-focused coping	.57	.00	−.03

[a] standardized regression coefficient
* $p \leq .05$

Table 11
Key Explanatory Variables in Regression Analyses of Emotions

Variable	R^2 change
Threat emotions (total explained variance = 48%)	
Wishful thinking	.23
Stakes	.12
Difficulty	.06
Seeking social support	.03
Challenge emotions (total explained variance = 48%)	
Feeling in control	.35
Problem-focused coping	.05
Stakes	.02
Self-isolation	.02
Harm emotions (total explained variance = 61%)	
Grade	.37
Self-blame	.15
Wishful thinking	.03
Benefit emotions (total explained variance = 57%)	
Grade	.33
Seeking social support	.11
Feeling in control	.05
Tension-reduction	.03

Note. Key explanatory variables account for approximately 90% of explained variance.

are apparently more heavily influenced by present, immediate concerns than by past performance. Second, the variable of stakes is involved in threat and challenge emotions, accounting for 12% of the variance in the former but only 2% in the latter. We expected that stakes would be associated with both threat and challenge emotions. However, the stakes assessed in this study had more to do with potential loss than gain, which may explain why stakes accounted for so little variance in challenge emotions. Third, aside from stakes, the appraisal variables and coping processes associated with threat emotions were different from those associated with challenge emotions. Feeling in control, for example, was correlated with challenge emotions and not negatively correlated with threat emotions as we had expected. Similarly, anticipating that the exam would be difficult was positively correlated with threat emotions, and not at all correlated with challenge emotions.

These findings suggest that threat and challenge to a limited degree share one variable in common, namely, stakes; beyond that, individual differences in threat and challenge seem to be influenced by different facets of the cognitive appraisal process. Threat and challenge emotions are also associated with different forms of coping. Wishful thinking and seeking social support are involved in threat emotions, whereas problem-focused coping and self-isolation are involved in challenge emotions. In short, with the exception of stakes, the profiles of appraisal variables and types of coping are different for threat and challenge emotions. In Part I we confirmed that threat and challenge emotions are normatively independent. Here in Part II we begin to see the underpinnings of this independence.

Harm and benefit emotions (Time 3). The regression analyses in which grade on the exam was entered first indicated that appraisal variables and coping explained 24% of the variance in both benefit and harm emotions beyond that which was explained by the grade the subject received. That about 40% of the explained variance in these emotions was due to appraisal and coping attests to the importance of these variables, and supports our argument that it is not just the outcome of the exam itself, but also its meaning and how it is coped with that affects the emotional response.

Further support for this argument comes from the results of the forward stepwise

regression analysis of harm emotions. When variables were entered with the forward stepwise procedure, self-blame, and not grade, accounted for the greatest amount of variance. Although we did not ask about the personal significance of the outcome, the use of self-blame (e.g., "Criticize or lecture myself," "Realize I brought the problem on myself") suggests that students attributed performance to controllable internal factors such as effort or skill, rather than external factors such as task difficulty. This interpretation would also explain why the perceived difficulty of the exam was not an important explanatory variable in harm emotions.

Aside from grade, the variables that accounted for the variance in harm emotions differed from those that accounted for the variance in benefit emotions. Harm emotions were correlated with self-blame and wishful thinking, whereas benefit emotions were correlated with seeking social support, feeling in control, and tension-reduction.

Contrary to our expectations, stakes were not among the most important variables in harm or benefit emotions, although they fell among the second tier of variables (see Tables 9 and 10). We had expected that the meaning of the grade (and therefore the emotion intensity) would be influenced strongly by how much the student had at stake. It is possible that the outcome of a midterm examination does not pose a very significant threat to personal stakes because it is only one of many such assessments of academic performance. Stakes may play a part in outcome emotions only in major examinations (cf. Mechanic, 1962).

General Discussion

Before discussing the principles that are supported by these findings, two inevitable qualifications should be made. Both concern the self-report nature of the data.

First, it is not possible to rule out the possibility that rather than reflecting actual psychological processes involved in emotion and coping with stress, our findings reflect the implicit theories our subjects hold about emotion and coping based, for example, on their readings and course work. This interpretation is not, in our view, the best guess about how to explain our findings, but it remains a logical possibility that cannot be dismissed without check experiments that draw on other levels of response, for example, the physiological and behavioral.

Second, both our conceptualization of variables and the dependence of our observations on self-report procedures can lead to blurred distinctions among appraisal, coping, and emotion variables in this research. These variables all hinge on self-reports that could conceivably overlap. For example, subjects report perceiving the exam as difficult and at the same time report a lack of a feeling of control over the situation, or that they are anxious or worried. This problem exists in all research of this kind, as it also does in attributional studies on emotion. Moreover, some of the concepts are difficult to disentangle, not because of sloppy definitions, but because they are inherently fused. For example, cognitive coping, or what we have sometimes referred to as defensive reappraisal, is difficult to disentangle from primary and secondary appraisal; both refer to how people construe what is happening for their well-being. Like the traditional concept of defense, without an indepth examination of mental contents in the specific context in which the process occurs, there are no reliable ways to distinguish when an appraisal is a form of cognitive coping in response to threat and when it is not. Even additional physiological and behavioral observations might not help. For example, too little is known about autonomic and endocrine response patterns as correlates of different emotions to use them to validate inferences based on self-report data. That these patterns differentiate among emotion qualities and intensities is itself a highly controversial issue that cannot be tested without self-report data. Therefore, although we acknowledge the problems inherent in self-report data, in the absence of a workable solution it makes sense to proceed with provisional interpretations.

Given the above qualifications, four important principles are supported by the findings of this study.

First, *stressful encounter is a dynamic, unfolding process, not a static, unitary event.* In the case of the midterm examination in this study, there were objective changes in the environment as the encounter proceeded from

the anticipation stage to the outcome stage, and there were concomitant and appropriate changes in emotions, coping, and the use of social support. To examine a stressful encounter without recognizing that its momentary properties may change can be misleading, and may also mean that one of the most important features of human adaptation, namely, the way people change troubled person–environment relationships through coping, will be ignored.

Second, *at any given phase of an encounter, people are likely to experience seemingly contradictory states of mind and emotions.* This principle is illustrated by the finding that subjects reported feeling both threat and challenge emotions during each phase of the exam. The juxtaposition of threat and challenge emotions reflects the fact that people see multiple possibilities and meanings in their relationships with the environment, especially when conditions are ambiguous. We need to know more about these multiple meanings, including those aspects of the encounter about which people feel threatened and challenged; and the extent to which appraisals are tied to the outcomes of the immediate event (the exam) and/or to future events for which the immediate event has meaningful implications (further exams, career, etc.)

Third, *people cope in complex ways.* In this study people combined problem-focused coping with multiple forms of emotion-focused coping at each stage of the encounter. This finding replicates previous results regarding problem- and emotion-focused coping (Folkman & Lazarus, 1980). The variety of coping strategies that were used in this study could mean that people were responding to different aspects of each stage of the examination and/or that they were trying out a variety of strategies in dealing with just one aspect. These possibilities need further exploration. What is clear from this study, however, is that to assess coping as a unidimensional trait, as is commonly done in stress and coping research, is to seriously underrepresent and distort the nature of actual coping processes.

It is also noteworthy that how and when people draw on social supports varies according to the stage and demands of the stressful encounter. Thus, when social support is treated as an aspect of coping, it is not a stable feature of the social world, but a process that changes in systematic ways.

This study also raised issues concerning how emotion-focused coping may facilitate or impede problem-focused coping. Problem-focused coping was associated with a specific form of emotion-focused coping, namely, emphasizing the positive. This pattern, which was also found by Aldwin et al. (1980), suggests that emphasizing the positive aspects of a stressful encounter facilitates problem-focused coping. Conversely, it is possible that some forms of emotion-focused coping, such as self-blame or wishful thinking, impede problem-focused coping.

Another interesting finding is that one form of emotion-focused coping, distancing, was singularly prominent during the waiting period after the exam and before grades were announced. Would this same pattern occur in other contexts of waiting, as in waiting to learn the outcome of a job interview or a medical diagnosis? Further, is distancing a form of coping that is associated with waiting in particular, or is it elicited in a more general class of situations in which there are few if any options for affecting change in the environment?

Fourth, *at any given phase of a stressful encounter there are substantial individual differences in emotion, and these in large part reflect individual differences in cognitive appraisal and coping.* Specifically, appraisals concerning stakes, perceived difficulty, and how much in control the person was feeling as well as various types of coping, accounted for large amounts of variance in reported emotions over and above traditional variables such as ability (GPA) and performance on the exam (grade).

What is needed is further investigation of these appraisal and coping variables in other stressful contexts, particularly those that are more stressful than a midterm exam. For instance, stakes that contain the possibility for mastery or gain need to be identified. Knowledge of these stakes would increase our understanding of individual differences in challenge emotions. Also, the variable "feeling in control" needs to be examined in greater detail. It would be useful to know the

aspect of the encounter over which the person feels in control. Is it a situational facet of the person–environment relationship such as a short-term outcome, for example, the task of preparing for the exam or the grade, or a longer-term outcome such as academic standing, the good will of the instructor, or an internal agenda such as managing emotion or the expression of feeling (cf. Folkman, 1984; Silver & Wortman, 1980)?

We need also to explore individual differences in the stability and variability of coping. Some individuals, for example, may have persisted in just one coping pattern across the three stages of the examination. Do such individuals experience different patterns of emotion from those whose coping pattern is more variable? And how do individuals who persist in one pattern of coping differ from others in their performance? Individual differences in coping stability–variability may be an important factor in coping effectiveness, and in short- and long-term adaptational outcomes in stressful encounters (cf. Folkman & Lazarus, 1981).

The findings that support the four principles noted depended on two modes of observation: experimental (in Part I), which concerns normative or shared treatment or condition effects that are produced by the environment, or, in this study, by the way a course instructor organized the demands of a college examination; and correlational (in Part II), which concerns individual differences that, despite shared patterns of reaction to different situational demands, always represent a major portion of the response variance. Cronbach (1957) referred to these modes as the "two disciplines of scientific psychology" which need to be integrated. Both modes are necessary if we are to study process and change; whether one is concerned with extended crises such as loss and grief, life course studies of stress and coping (see Lazarus & DeLongis, 1983), or very brief encounters such as the examination stress we have studied here.

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