

2002s-05

**Coping with stressful decisions:  
Individual differences, appraisals,  
and choice**

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**Série Scientifique**  
*Scientific Series*

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**CIRANO**  
Centre interuniversitaire de recherche  
en analyse des organisations

Montréal  
Janvier 2002

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# Coping with stressful decisions: Individual differences, appraisals, and choice

*Ann-Renée Blais*\*

## **Résumé / Abstract**

Cette étude empirique adapte le modèle de stress et coping de Lazarus et Folkman (1984) à la description de processus de décision. Elle évalue aussi le rôle de facteurs situationnels et individuels dans des processus de coping et de décision. Lors de la première phase de l'expérimentation, les participants décrivent deux décisions stressantes auxquelles ils étaient confrontés (i.e., des décisions d'ordre romantique et scolaire) et complètent des échelles mesurant divers traits de personnalité et styles cognitifs, de même que des mesures d'évaluations cognitives de menace, de défi et d'auto-efficacité. Trois semaines plus tard, ces mêmes participants évaluent leur utilisation de diverses stratégies d'adaptation, ou méthodes de coping, pour faire face à leurs décisions décrites précédemment. Ils remplissent à nouveau les mesures d'évaluations cognitives et décrivent les options ou alternatives considérées afin de résoudre leurs décisions. Les résultats de systèmes d'équations structurelles suggèrent que les évaluations cognitives d'auto-efficacité des individus influencent leur utilisation de diverses stratégies d'adaptation. De plus, les mesures d'affectivité positive et de peur de l'invalidité sont indirectement reliées, via ces évaluations cognitives, à l'utilisation des diverses stratégies d'adaptation. Les méthodes de coping et les évaluations cognitives d'auto-efficacité ont aussi un impact sur les caractéristiques de l'option ou alternative préférée. Enfin, le domaine de décision (i.e., romantique vs. scolaire) modifie certaines relations entre les construits. Les résultats de cette étude longitudinale démontrent que les théories du stress et coping ajoutent à la compréhension des processus de décision et de choix des individus.

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*This study adapts Lazarus and Folkman's (1984) model of stress and coping to describe individual decision processes. This research also investigates the role of situational and person factors in coping and choice processes. In the first phase of the experiment, participants described two stressful decisions they were facing (i.e., a romantic decision and a school-related decision) and completed personality and cognitive style inventories as well as measures of threat, challenge, and self-efficacy appraisals. Three weeks later, the same participants reported how they had dealt with their decisions. They also completed the appraisal measures and described the choice options they would prefer (or had chosen). Results of structural equation modeling reveal that appraisals of self-efficacy influence coping patterns. Furthermore, individual difference measures of positive affect and fear of invalidity were indirectly related to coping via self-efficacy appraisals, and coping patterns and self-efficacy appraisals predicted aspects of the choice. Differences in decision domains qualified some of the relationships among constructs. Overall, the findings show that theories of stress and coping add insight to choices and their surrounding experiences.*

**Mots Clés :** Processus de décision, stress, coping, évaluations cognitives, traits de personnalité, domaine de décision, équations structurelles

**Keywords:** *Decision processes, stress, coping, cognitive appraisals, personality traits, decision domain, structural equation modeling*

## Introduction

### Emotions and Decision Making

How do emotions such as fear, stress, and anger influence decisions? How, if at all, should they be incorporated into the decision making process? Expected utility models, widely used in the social sciences, do not answer these questions directly. In Judgment and Decision Making (J/DM) research, some theories have addressed the impact of anticipated emotions, or imagined feelings of disappointment, guilt, and rejoicing, on choices (Mellers, Schwartz, & Ritov, 1999), while others have considered the emotions we experience at the time of a choice. For example, Loewenstein, Weber, Hsee, and Welch (2001) developed a “risk-as-feelings” hypothesis in which people react to risky situations based on the severity of the outcomes and their likelihood of occurrence, but first and foremost, at a gut level. This gut level reaction is likely to be influenced by both anticipated and experienced emotions. For example, deciding whether to accept a job offer may engender immediate emotions of excitement and fear, as well as anticipated emotions of elation and regret.

Loewenstein et al.’s (2001) hypothesis resembles Janis and Mann’s (1977) conflict theory of decision making, according to which the way individuals deal with stress determines the success or failure of their decisions. Conflict theory suggests that the more goals are left unsatisfied by the choice and the more important are the outcomes of the decision, the greater is the decisional conflict. In other words, psychological stress arises from concerns about potential losses (e.g., personal, material, or social) associated with whatever option is chosen (Mann, Burnett, Radford, & Ford, 1997).

### Lazarus and Folkman’s (1984) Framework

The best-known and most widely used model of psychological stress in clinical psychology is the framework proposed by Lazarus and Folkman (1984). Lazarus and Folkman define stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (p.19).

Appraisals. The concept of appraisal, central to Lazarus and Folkman’s model (1984) of stress and coping, has often been linked in psychology to emotions in general, and to stress in particular (Monroe & Kelley, 1997). Lazarus and Folkman distinguish between *primary* and *secondary* appraisals, which interact to determine the degree of stress experienced by an

individual, and the content and strength of his or her emotional reaction. Primary appraisals involve the stakes of the outcomes (Lazarus, 1991). In other words, the individual is thinking, “Am I in trouble or being benefited, now or in the future, and in what way?” (Lazarus and Folkman, p.31).

When a stressful situation has no apparent implication for an individual’s well-being, the encounter is labeled as *irrelevant*. If, on the other hand, the situation is perceived as *stressful* (i.e., as taxing or exceeding a person’s resources and menacing his or her well-being), three stress appraisals can arise: (1) *harm/loss*, for situations in which some damage to the individual has already occurred; (2) *threat*, for situations in which damage or loss is anticipated to take place; and (3) *challenge*, for situations presenting the potential for growth or gain (Lazarus & Folkman, 1984). In other words, threat and challenge appraisals constitute separate types of stress appraisals and concentrate on different aspects of the stressful encounter (i.e., potential harms vs. potential gains).

Distinct from primary appraisals are secondary appraisals, taking into account “which coping options are available, the likelihood that a given coping option will accomplish what it is supposed to, and the likelihood that one can apply a particular strategy or set of strategies effectively” (Lazarus & Folkman, 1984, p.35). Thus, secondary appraisals may include efficacy expectations or a person’s conviction that he or she can successfully engage in the behavior required to produce a desired outcome (Bandura, 1977).

Coping. Coping is related to, yet different from, appraisals. Secondary appraisals have to do with the process of evaluating coping resources and options, whereas coping is defined as “constantly changing cognitive and behavioral efforts to *manage* specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person” (Lazarus & Folkman, 1984, p.141). Because coping is defined as the effort to manage a situation, it should not be confounded with the outcome of the situation. In fact, coping includes anything the individual thinks or does, *regardless* of how badly or well it works (Lazarus & Folkman).

Numerous investigators and clinicians have recognized at least two major types of coping, both of which are used by individuals to deal with stressful situations (Folkman, 1984): (1) regulation of emotions or distress (i.e., *emotion-focused* coping), and (2) management of the problem at the origin of the emotions/distress (i.e., *problem-focused* coping). According to

Lazarus and Folkman<sup>1</sup> (1984), emotion-focused coping refers to a wide array of cognitive processes such as avoidance, minimization, and distancing, as well as to behavioral strategies such as meditating, drinking, and seeking emotional support. Problem-focused coping involves objective and analytic processes that focus on the environment (e.g., problem-solving strategies such as generating solutions and weighting alternatives), but also strategies that are directed inward (i.e., motivational and cognitive changes such as learning new skills and behaviors). Lazarus and Folkman point out that everyone uses both emotion- and problem-focused forms of coping in virtually every stressful situation.

The distinction between emotion- and problem-focused coping has, however, proven to be too simplistic for most situations, as coping behaviors typically involve more than two underlying constructs (Carver, Scheier, & Weintraub, 1989). For example, emotion-focused coping may refer to denial (e.g., “I act as though it [the stressful event] hasn’t even happened”) or positive reinterpretation (e.g., “I look for something good in what is happening”), which are very different coping responses (Carver et al.). Similarly, problem-focused coping may imply different actions, such as making plans or searching for information.

After conducting confirmatory factor analyses on three coping inventories (i.e., the Coping Strategies Inventory; Tobin, Holroyd, Reynolds, & Wigal, 1989; the Coping Inventory for Stressful Situations; Endler & Parker, 1994; and the COPE; Carver et al., 1989), Cook and Heppner (1997) reported a three-factor model as better describing coping processes. The three constructs retained were: (1) Problem-Focused/Task-Oriented, (2) Social-Support/Emotional Expression, and (3) Avoidance. Other researchers have argued that social support may not constitute a “pure” and stable coping dimension but may be a problem-solving or an emotional strategy, depending on the type of support received (Schwarzer & Schwarzer, 1996).

#### Relationships Among Appraisals, Coping, and Situational/Person Factors

Empirical evidence shows that primary appraisals of threat and challenge have direct effects on coping behaviors. Peacock, Wong, and Reker (1992), studying 185 undergraduate students in search of employment, found that appraisals of challenge were positively related to the students’ use of problem-focused coping behaviors, whereas appraisals of threat were

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<sup>1</sup> Mann et al. (1997) compare the concepts of emotion- and problem-focused coping to Janis and Mann’s (1977) notions of, respectively, *defensive avoidance* and *vigilance*. Janis and Mann’s notions parallel Lazarus and Folkman’s (1984) concepts and provide additional support for a categorization of coping behaviors although their original work was mostly descriptive.

positively related to the students' reliance on emotion-focused coping behaviors. McCrae (1984) showed that individuals facing challenges reported relying significantly more frequently on positive thinking and humor than did respondents facing losses or threats. Conversely, respondents dealing with threats used wishful thinking (expressed their feelings) significantly more (less) often, than did individuals dealing with a loss or a challenge. With respect to another coping strategy, reliance on social support, Taylor (1991) suggests that negative events tend to elicit support seeking, but she also acknowledges that, under certain conditions, people may choose not to be with others (e.g., threatening events that elicit embarrassment). Thus, appraisals of threat and challenge may, in different contexts, both be associated with social support coping.

Researchers have extensively studied the link between coping and secondary appraisals and have demonstrated that the greater are the situational control beliefs, the more people rely on problem-focused coping (Aldwin, 1991; Carver et al., 1989; Folkman & Lazarus, 1980; Peacock, et al., 1992). On the other hand, empirical evidence suggests that appraisals of low controllability tend to be associated with greater emotional distress and greater emotion-focused coping (Aldwin; Folkman & Lazarus), although the evidence to that effect is mixed (Peacock et al.). Terry (1991, 1994) examined the influence of self-efficacy appraisals on coping behaviors. After controlling for the effects of person factors such as self-esteem and generalized control beliefs, she found that self-efficacy appraisals were positively related to the use of instrumental behaviors and negatively related to the use of escapism/self-blame strategies.

Studies that have investigated the impact of "objective" characteristics of a stressful situation on coping have shown that coping patterns tend to vary across situations or problem types. For example, Compas, Forsythe, and Wagner (1988) found that participants reported using catharsis and social support more frequently when dealing with interpersonal problems and relaxation strategies when dealing with academic problems. Rivkin and Taylor (1999), in their investigation of the effects of mental simulation on coping with controllable stressful events, found that participants who were coping with an academic problem perceived their problem as generating greater control and self-efficacy appraisals, and greater plan-making than did participants who were facing an interpersonal problem.

A great deal of research has also related personality traits to coping, linking, for example, neuroticism to emotion-focused coping and optimism, self-esteem, and internal control beliefs to problem-focused forms of coping (Hewitt & Flett, 1996; Aspinwall & Taylor, 1992; Terry,



1991). Yet, other person factors, such as cognitive styles, have been largely ignored in stress and coping models, although they may also predict how individuals cope with stressful events.

### Mediation and Moderation Models

That appraisals, problem types, and person factors influence coping directly has been well documented as briefly described above. However, theoretical and empirical evidence is rather scarce with respect to alternative models. For example, coping patterns may differ across problem types, but is this change partly explained by changes in appraisal evaluations (i.e., a mediation<sup>2</sup> model)? Appraisals may influence coping, but do these relationships change across stressful situations (i.e., a moderation model)?

Terry (1991, 1994) is one of the few authors who have explored these issues in more detail. To investigate the role of problem types in the coping process, Terry (1994) asked participants to describe a current stressful event they were facing. She then coded the events as work/study, interpersonal, health, and other problems and found that not only did problem types influence coping, but that this effect was, in some cases, mediated by control appraisals. That is, individuals confronting work stressors reported greater instrumental action and lower social mobilization, partly because they perceived those stressors as being more controllable than did individuals dealing with other types of stressors.

Terry (1991) found little support for mediation models relating person factors such as denial, generalized control beliefs, and self-esteem to coping through appraisals of stress and situational control. However, conducting another, similar, study, Terry (1994) reported evidence for mediation models linking self-esteem and neuroticism to escapism and self-blame, respectively, through self-efficacy appraisals, suggesting that, at least in some cases, person factors influence coping behaviors through appraisal evaluations.

### Summary

Primary appraisals of threat and challenge, as well as secondary appraisals of self-efficacy, influence coping directly, and the type of problem faced by an individual also plays a role in the coping process. Person factors such as self-esteem and neuroticism also influence coping directly and/or through appraisals. Whether the relationship between appraisals and coping change across decision types has yet to be investigated in detail, but this hypothesis is

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<sup>2</sup> In *mediation*, a variable X affects a variable Y *through* a variable Z, whereas in *moderation*, the relationship between X and Y changes across various levels of Z (Baron & Kenny, 1986).

intuitively appealing.

Whether problem types and person factors influence coping directly or via appraisals, or whether they influence the relationship between appraisals and coping depends on the problems, person factors, appraisals, and coping behaviors under consideration. For example, some person factors may only have direct effects on coping, while others may partly predict coping through appraisals. In fact, different models may co-exist, with each model characterizing specific relationships among the components of a particular stressful event.

### Research Hypotheses

Although researchers in clinical/personality/social psychology have extensively studied and used Lazarus and Folkman's (1984) framework, they have never linked it in its totality to decision making processes. This state of affairs is not surprising given that Lazarus and Folkman did not conceptualize their model as a model of choice. However, to relate stress and coping to decision making and choice may be of theoretical and practical interest to researchers and clinicians alike. Furthermore, Lazarus and Folkman's model may be useful in explaining and predicting choice in a way that complements "traditional" theories of choice (i.e., expected utility models), as their model integrates situational and individual differences, as well as emotional considerations, into coping and choice processes.

Thus, the present research intends to apply Lazarus and Folkman's (1984) model to choices from different domains, replicate well-known results from the stress and coping literature, and investigate relationships among problem types, person factors, stress appraisals, coping, and choice. In particular, based on findings reported in the stress and coping literature, we can propose several testable hypotheses:

- H1. Appraisals predict coping.
- H2. Person factors influence coping through appraisals.
- H3. Appraisals influence choice characteristics through coping.
- H4. Problem types affect relationships among appraisals, coping, and choice.
- H5. Predicted and actual choices of an option are positively correlated.

Hypothesis 5 implies that we will loosely compare Lazarus and Folkman's (1984) model to the Subjective Expected Utility (SEU) framework. We cannot compare the models formally, as the stress and coping model addresses the psychological processes that precede an actual choice, whereas the SEU model is concerned with subjective probability estimates, utility

estimates and the prediction of a choice.

## Method

We present the participants, materials, and procedure for the first phase of the study and then for the second part, which took place three weeks later.

### Time 1

#### Participants

Two hundred ninety-three undergraduate students participated in the first phase of the study. There were 203 women and 90 men aged 16 to 27 (median of 18). Participants received course credits in partial fulfillment of requirements for an introductory psychology course. They received full credit only if they completed both phases of the experiment, which were scheduled to take place three weeks apart. Participants who successfully completed the two sessions also had the chance to win one of two \$25 lottery prizes.

#### Materials

Personality/cognitive style inventories. Research on the role of positive affect in decision making has suggested that it tends to promote the generation, exploration, and enjoyment of new ideas and possibilities. When motivated to do so, individuals in a positive mood will elaborate on a task more and will deal with it more effectively and efficiently than will individuals in neutral or negative mood states (Isen, 1993). In fact, a measure of positive mood showed significant positive relationships to the use of active coping behaviors and social support (Aspinwall & Taylor, 1992). Thus, a predisposition toward positive affect may also be positively related to the use of problem-focused and social support coping strategies.

We chose the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), in its dispositional format, to measure positive affect. The Positive Affect (PA) subscale of the PANAS is composed of 10 mood descriptors such as “Strong” and “Excited.” Participants indicate, using a five-point Likert scale (from “Very Slightly/Not at all” to “Extremely”), the extent to which they generally feel this way. Watson et al. reported adequate Cronbach’s alphas ( $N = 663$ ;  $\alpha_s = 0.88$  and  $0.87$ ) and test-retest correlations ( $N = 101$ ; Pearson  $r_s = 0.68$  and  $0.71$  for a 8-week retest interval) for the 10-item PA and Negative Affect subscale scores, respectively, with samples of undergraduate students. They also provided evidence of the factorial validity of these subscales as well as of the convergent and discriminant validity of their scores with respect to related measures of general distress, dysfunction, and depression.

Researchers have largely ignored the role of cognitive styles in stress and coping models, although constructs such as fear of invalidity may have relevant implications. This construct is related to the perceived costs of error as a result of some decision and is associated with consequences such as generation of hypotheses, careful information search, less confidence in one's beliefs, and delay in reaching closure (Thompson, Naccarato, Parker, & Moskowitz, in press). To assess fear of invalidity, we selected the Personal Fear of Invalidity Scale (PFI; Thompson, et al.), which consists of fourteen items such as "I tend to struggle with most decisions" and "I wish I didn't worry so much about making errors." Individuals rate, using a six-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree," how much they agreed with each of the statements. Thompson et al. presented in detail the development of the instrument and the replication of its factor structure. They also investigated, with samples of undergraduate students, the internal consistency ( $\alpha > 0.80$ ), and the convergent and discriminant validity of the PFI scores with respect to constructs such as authoritarianism, rigidity, depression, and self-consciousness.

Problem types. Participants thought about and described two important decisions they were facing at the time (a romantic decision and a school-related decision). The experimenter asked the participants to focus on decisions that involved a great deal of thought and would not be resolved rapidly. For each decision problem, individuals wrote down a short narrative of the problem and described, in a few sentences, two or three options that they were considering to resolve it. For example, a female participant described her romantic decision as follows:

My decision is whether or not to get involved with a friend. Another problem is he goes to school far away. I think it would be cool but I don't know when we'd see each other. I also don't want it to affect our friendship. It is also difficult because of other parties involved and I wouldn't want that to turn out bad.

Her options were to "Stay friends for now ..." or "See each other when we visit each other."

A male student described his school-related decision as follows:

I am facing a major decision. Whether or not to continue with pre-med or switch to psychology. Pre-med is a long drawn out course that never ends. I hate math and science but my goal is to become a doctor. At least that is what my parents want. I don't want to but I want to end up helping people. The road is so long.

His options were to either "Switch to psychology" or "Stay with pre-med."

Primary and secondary appraisals. We derived our measures<sup>3</sup> of threat and challenge appraisals from the Stress Appraisal Measure (SAM; Peacock & Wong, 1990), composed of six four-item subscales and based on Lazarus and Folkman's (1984) framework. We developed our Threat and Challenge four-item subscales using items such as "This decision may result in a bad outcome" and "This decision may have a positive impact." Participants rated, on a six-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree," how much they agreed with the statements with respect to the specific decision they had to make.

As mentioned previously, there has been a lack of research linking situational self-efficacy to coping (Terry, 1991), so we included this secondary appraisal dimension in the present study instead of more widely studied dimensions such as perceived control. To assess self-efficacy in a decision making situation, we constructed a short six-item Self-Efficacy Scale based on Bandura's (1977) work on efficacy expectations and Lazarus and Folkman's (1984) definition of secondary appraisals. Again, participants rated on a six-point Likert scale how much they agreed with statements such as "I am confident that I can resolve this decision" and "I have the resources necessary to handle this decision."

### Procedure

Participants filled out the questionnaire in small groups of 15 to 20 individuals. The experimenter welcomed the participants in a classroom, gave detailed instructions and examples, and answered questions. Participants completed the inventories, and described, in a counterbalanced order, their two decision problems as well as the options or alternatives they were considering. Finally, they rated their appraisals of threat, challenge, and self-efficacy. Most participants took 20-25 minutes to complete the task and, before leaving, they signed-up for a follow-up session scheduled to take place three weeks later.

### Time 2

To infer that a variable X is a cause of Y, X must precede Y in time, among other requirements (Kline, 1998). Because one of the main hypotheses under investigation was concerned with the influence of appraisals<sup>4</sup> on coping, we decided to measure appraisals before

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<sup>3</sup> We tested some of the appraisal, coping, and choice items in a pilot study prior to the experiment.

<sup>4</sup> The relationship between appraisals and coping is likely to be reciprocal with both coping and appraisals changing as the stressful encounter unfolds (Lazarus & Folkman, 1984). The present study aims to provide an overview, for a specific time period, of the complex relationships that operate in such a context.

coping. So at Time 1, participants completed the measures of appraisals, and, at Time 2, they retrospectively reported the frequency with which they had used various coping behaviors. We decided upon a three-week time interval between Times 1 and 2 to allow participants enough time to cope with their decisions, but not enough time to dismiss or resolve their problems.

### Participants

Two hundred sixty undergraduate students came back for the second phase of the study (89% of the 293 students who completed the first phase of the study). The sample included 186 women and 73 men aged 16 to 27 (median of 18).

### Materials

Coping. No instruments exist to assess coping behaviors in specific decision making situations. We thus constructed a scale by rewording items from existing scales (so they would be more appropriate for the situational/decision making focus of the present study) such as the Coping Strategies Inventory (CSI; Tobin et al., 1989), the COPE (Carver et al., 1989), and the Melbourne DMQ (Mann et al.). The resulting instrument, or “Coping Scale,” included a total of 20 items hypothesized as forming distinct coping subscales: Problem-Focused (e.g., “I made a plan of action and followed it”), Social Support (e.g., “I talked to friends and relatives about how I felt”), and the Avoidant (e.g., “I wished the decision could resolve itself by magic”) subscales. Instructions were as follows: “The following statements represent ways of coping with your romantic (or school) decision. Indicate the frequency with which, in the past three weeks, you have used each strategy when trying to deal with this decision.” Participants gave their ratings on a six-point Likert scale ranging from “Rarely or Never” to “Always.”

Choice. Within each decision problem, participants described two options or alternatives that they were seriously considering as potential solutions to their problem and described two likely consequences of each option, based on the following instructions: “Many things may happen when you select a particular option. Take some time to think about the two options you are most likely to consider and write down the two most likely consequences associated with each of these options.” Respondents gave a probability estimate for each of the two consequences, provided that the sum of their two probability estimates for any given option could not be greater than 100%. They also rated the “utility value” of each of the consequences, or their anticipated emotions if the consequence were to happen, on a six-point rating scale ranging from “Very Unhappy” to “Very Happy.”

Finally, the last section of the questionnaire had to do with the actual choice of an option and the characteristics or “qualities” of that choice. Participants first indicated which of the two options they had described they would be most likely to choose if they were to make a decision at that particular moment. For those participants who reported having already made a decision, the preferred option could be (or not) the option they had actually chosen. But because the choice of an option was dependent on a particular individual and his or her decision problem, it does not provide useful information per se. Thus the participants also rated aspects or qualities of their preferred option using what we call the “Choice Scale.”

We developed that in an exploratory manner, as no instruments exist that measure such constructs. The items had to be related to a stress and coping framework (i.e., avoidant coping behaviors leading to “avoidant” choices). We thus constructed two subscales to that effect: the “Vigilant” and the “Avoidant” subscales. The Vigilant subscale was composed of four items such as “This choice results from a careful evaluation of all possible consequences,” and the Avoidant subscale of six items, such as “With this option, I am postponing any real commitment.” Participants rated, on a six-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree,” the extent to which they agreed with the statements.

### Procedure

Participants filled out the questionnaire in small groups of 15 to 20 individuals. The experimenter welcomed the participants in a classroom and gave detailed instructions and examples. Participants first read the narratives they had written at Time 1, and they indicated whether they had already resolved their decisions. Then, for each decision, in a counterbalanced order, they completed the section on consequences, probabilities, and utilities. Finally, they indicated which of the considered options they would be more likely to choose and completed the Choice Scale. Most participants took 25-30 minutes to complete the task.

### Results

In this section, we will first report the results<sup>5</sup> of the measurement models associated with the Threat, Challenge, and Self-Efficacy scales for the data collected at Time 1<sup>6</sup>. We will next

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<sup>5</sup> We screened the entire dataset for univariate outliers and closely examined any  $z$  value greater than 4.0, which, in most cases, resulted from some participants’ flagrant carelessness and were replaced by missing values (Stevens, 1996). Exploratory and confirmatory analyses utilized correlation matrices among scale items based on listwise deletion, and given that only 6% of the data, at most, were missing, no remedial measures were taken (Cohen & Cohen, 1983).

describe the measurement models for the Coping and Choice Scales, for the data collected at Time 2, as well as the analyses we conducted to test specific research hypotheses. We first compared, using repeated-measures t-tests, the mean appraisal, coping, and choice ratings across decisions, as we expected situational differences based on previous research (e.g., the Romantic decision triggering greater threat appraisals). We then used structural equation models and tests of mediation to verify whether appraisals influenced coping (Hypothesis 1), whether person factors affected coping through appraisals (Hypothesis 2), and whether appraisals affected choice characteristics through coping (Hypothesis 3). Finally, we conducted correlational analyses to examine the link between an individual's actual and predicted choices from a SEU standpoint (Hypothesis 5).

In order to investigate whether the factor structures of the scales and relationships among constructs differed across decision types (a moderation hypothesis; Hypothesis 4), we obtained measurement and structural equation models for each decision type. The simplest way<sup>7</sup> to address whether estimates of model parameters vary across groups (or here, across decision types for the same participants) is to conduct separate analyses for each group and then visually inspect the fit measures and parameter estimates and their associated confidence intervals (Maruyama, 1998).

### Measurement Models

Primary and secondary appraisals. We conducted exploratory factor analyses<sup>8</sup> (EFAs) iteratively on the appraisal items. By retaining the “best” items (i.e., the items with moderate or high loadings on their hypothesized factor and low loadings on the others), we obtained a final<sup>9</sup>

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<sup>6</sup> For the PANAS and PFI, we conducted a confirmatory factor analysis using parcels of items. A parcel is simply the sum of several items assessing the same underlying construct. The use of parcels is preferred over the use of single items in factor analysis as questionnaire items tend to have low communalities and hyperplanes that are difficult to determine (Kishton & Widaman, 1994). Detailed solution are available from the first author.

<sup>7</sup> More sophisticated techniques, associated with formal tests of measurement and structural invariance, are available but such models would have required the fitting of large correlation matrices relative to the sample sizes available. Small sample size-to-indicators ratios tend to be associated with unstable solutions (Kline, 1988). Consequently, we decided to rely on descriptive tests of invariance, although we acknowledge the weaknesses of such methods.

<sup>8</sup> We conducted the EFAs with CEFA, a new exploratory factor analysis program developed by Browne, Cudeck, Tateneni, and Mels (1999) and submitted the correlation matrices to a target rotation. In target rotation, the user builds a target matrix specifying the number of factors and the general pattern of loadings expected, with zeros indicating very small expected loadings on a given factor and free entries otherwise, but no measures of fit of the specified target are available (Gorsuch, 1983). We used oblique rotation, allowing the rotated factors to be correlated.



13-item, three-factor solution<sup>10</sup> with four threat, four challenge, and six self-efficacy items. The fit of the model was fair and the solutions were similar for both decisions (see Table 1 for fit measures). Items had moderate to high loadings on their respective hypothesized factors, from 0.66(0.04) to 0.96(0.04)<sup>11</sup> and from 0.68(0.05) to 0.99(0.03) for the Romantic and School decisions, respectively, all  $p < .05$ . The Threat and Self-Efficacy factors were significantly correlated,  $\Phi = -0.65(0.04)$ ,  $t$ -value = -16.67 and  $\Phi = -0.55(0.06)$ ,  $t$ -value = -9.91, as were the Challenge and Self-Efficacy factors,  $\Phi = 0.30(0.14)$ ,  $t$ -value = 2.20 and  $\Phi = 0.55(0.06)$ ,  $t$ -value = 9.31, for the Romantic and School decisions, respectively. The correlation between the Threat and Challenge factors was nonsignificant for both decisions,  $\Phi = -0.14(0.14)$ ,  $t$ -value = -0.99 and  $\Phi = -0.13(0.10)$ ,  $t$ -value = -1.35.

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Insert Table 1 about here  
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We summed item ratings for those items with moderate or high loadings on the same factor. We then divided the obtained scores by the number of items per subscale, so we could compare scores across subscales. Tables 2 and 3 show descriptive statistics, coefficient alphas, and correlations among the measured variables. Interestingly, participants perceived both decisions as being more challenging than threatening, but repeated-measures  $t$ -tests<sup>12</sup> revealed

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<sup>9</sup> We analyzed the data using the overall sample, but we also did so with half of the sample and replicated the results with the other half. We obtained similar results in all cases, so we only report here the results pertaining to the overall sample.

<sup>10</sup> We conducted all analyses using the maximum likelihood (MWL) and ordinary least squares estimation (OLS) methods, as some of the items exhibited significant skewness. In most cases, both solutions were very similar, so only the MWL estimates are reported. We present the Pearson chi-square statistic with degrees of freedom equal to the difference between the number of data values and the number of parameters. If the test statistic is significant, the model is rejected. However, because the chi-square statistic is very sensitive to sample size, its usefulness as a fit index is questionable (Kline, 1998). We thus also include an alternative measure of model fit, the Root Mean Square Error of Approximation (RMSEA) which takes into account model complexity and for which confidence intervals are available. Guidelines for interpretation of the RMSEA are as follows: RMSEA < 0.05 indicates close fit, 0.05 < RMSEA < 0.08 indicates fair fit, and RMSEA > 0.10 indicates poor fit (Browne & Cudeck, 1993).

<sup>11</sup> Standard errors are shown in parentheses.  $T$ -values follow an approximately standard normal distribution. By convention, if  $|t| > 2$ , then the parameter estimate is considered to be significantly different from 0. We used significance levels of .05 except when otherwise noted. Detailed solutions and correlation matrices are available upon request.

<sup>12</sup> We conducted all planned comparisons using a significance level of  $p = .0091$  ( $p = .05/11$ ; one-tailed) based on a Bonferroni test to maintain a familywise alpha level of .05 (Keppel, 1991). When skewness could have been problematic, Wilcoxon signed rank tests yielded similar results as the ones obtained with the parametric procedure.

they perceived their romantic decision as being significantly more threatening than their school decision,  $t(289) = 3.54, d = 0.21$ . Conversely, participants perceived their school decision as being significantly more challenging and as triggering greater self-efficacy appraisals than their romantic decision,  $t(284) = 6.75, d = 0.40$ , and  $t(288) = 5.20, d = 0.31$ , respectively.

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Insert Tables 2 and 3 about here  
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## Time 2

Coping. The initial pool of coping items consisted of 20 items and resulted in a final 14-item, three-factor model with six problem-focused, four avoidant, and four social support items. The fit of the model was fair and the solutions were similar for both decisions (see Table 1 for fit measures). Factor loadings associated with the hypothesized factor structure varied from 0.26(0.06) to 1.10<sup>13</sup>(0.05) and from 0.55(0.07) to 1.08(0.05), for the Romantic and School decision, all  $p < .05$ . Estimated correlations among the Problem-Focused, Avoidant, and Social Support factors were significant, ranging, in absolute values, from  $\Phi = 0.33(0.09)$ ,  $t$ -value = 3.64 to  $\Phi = 0.73(0.03)$ ,  $t$ -value = 21.5. Across decision types, participants reported using problem-focused forms of coping more frequently than social support and avoidant forms of coping (see Table 2). Yet, respondents stated relying on problem-focused forms of coping significantly more often when dealing with their school decision versus their romantic decision,  $t(251) = 5.35, d = 0.34$ ; whereas they revealed relying on avoidant coping behaviors significantly more frequently when coping with their romantic decision versus their school decision,  $t(248) = 4.53, d = 0.17$ .

Choice characteristics. We obtained a final seven-item, two-factor model, with three items loading on the Avoidant factor and four items loading on the Vigilant factor. The fit of the model was good (although the 90% confidence intervals were rather larger; see Table 1) and the solutions were similar for both decisions. Factor loadings associated with the hypothesized factor structure varied from 0.67(0.06) to 0.89(0.06) and from 0.60(0.07) to 0.88(0.06), all  $p < .05$ . The estimated correlation between the Vigilant and Avoidant factors was significant,  $\Phi = -0.57(0.06)$ ,  $t$ -value = -9.79 and  $\Phi = -0.58(0.05)$ ,  $t$ -value = -10.55, for the Romantic and School decisions, respectively. Across decision types, participants described their preferred option as being more

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<sup>13</sup> The use of oblique rotation in factor analysis may result in factor loadings greater than 1.0. This does not necessarily indicate a problem with the solution.

vigilant than avoidant (see Table 2). Yet, they rated their romantic choice as being significantly more avoidant than their school-related choice,  $t(250) = 3.57$ ,  $d = 0.23$ , and they perceived their school-related choice as being significantly more vigilant than their romantic choice,  $t(249) = 3.16$ ,  $d = 0.20$ .

### Effects of Appraisals on Coping

For each decision type, we tested structural equation models<sup>14</sup> relating appraisals and coping behaviors. A first model included directional paths from Threat to Social Support and Avoidant coping, from Challenge to Social Support and Problem-Focused coping, and from Self-Efficacy to Avoidant and Problem-Focused coping. Theoretical and empirical evidence suggests that both threat and challenge appraisals may influence reliance on social support resources (Taylor, 1991), so we included both paths in the model. We also included bidirectional paths between the appraisals.<sup>15</sup> We expected the magnitude of the correlation between Threat and Challenge to be weak however, because they are conceptualized as being independent constructs (Folkman & Moskowitz, 2000).

The first model resulted in the following situational differences: for the School decision, the Self-Efficacy and Challenge factors were significantly correlated,  $\Phi = 0.36(0.07)$ ,  $t$ -value = 5.50, and Self-Efficacy significantly influenced Problem-focused coping,  $\beta = 0.28(0.07)$ ,  $t$ -value = 3.73. Such relationships were not statistically significant for the Romantic decision,  $\Phi = 0.03(0.07)$ ,  $t$ -value = 0.45 and  $\beta = -0.04(0.07)$ ,  $t$ -value = -0.50, respectively (see Figure 1 for the Romantic decision and Figure 2 for the School decision). We tested another model in which the paths relating Threat and Challenge to, respectively, Avoidant and Problem-Focused coping were dropped, as the first model had showed that these paths were not significant. The nonsignificant difference in overall model fit between the first and second models for the Romantic and School decisions,  $\chi^2_{\text{difference}}(2) = 4.55$  and  $\chi^2_{\text{difference}}(2) = 3.55$ , both  $p > .05$ , suggests that the addition of the two paths to the model did not account for additional variation in coping behaviors.

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<sup>14</sup> We conducted all analyses in RAMONA (in SYSTAT; Browne & Mels, 1998) using both the MWL and OLS estimation methods. In most cases, both solutions were very similar, so only the MWL estimates are reported. Again, we present the chi-square statistic and the RMSEA. We included parcels of items in the models, instead of single items, whenever possible. Correlation matrices are available upon request.

<sup>15</sup> We hypothesized bidirectional relationships between appraisals rather than directional ones because no precedence in time could be assumed in that case.

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Insert Figures 1 and 2 about here  
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The hypothesis (H1) that appraisals directly influenced coping was thus partially supported. The impact of threat and challenge appraisals on coping was rather weak and only self-efficacy appraisals had a significant effect on coping, and its effect on problem-focused coping usage was significant only for the School decision (as was the correlation between the Challenge and Self-Efficacy factors).

#### Effects of Person Factors on Coping

To investigate whether person factors influenced appraisals and affected coping patterns through appraisals, we conducted structural equation models and mediation tests for each decision type. In particular, we expected fear of invalidity to influence avoidant coping usage through self-efficacy appraisals. That is, individuals with high fear of invalidity may experience low self-efficacy in stressful decision making situations and, thus, may use avoidant strategies more frequently than do individuals with high fear of invalidity. Similarly, we expected positive affect to be positively related to problem-focused coping usage through self-efficacy appraisals. We chose self-efficacy as a potential mediator over threat and challenge appraisals, because its link to person factors and coping behaviors is more straightforward and has been demonstrated in previous research as well as in the present study.

Mediation models. In order for mediation to occur, there must be: (1) a significant effect of the independent variable (IV) on the dependent variable (DV) in the absence of the mediator, (2) a significant effect of the IV on the mediator<sup>16</sup>, (3) a significant unique effect of the mediator on the DV, and finally, (4) the effect of the IV on the DV should be reduced when the mediator is added to the model (Preacher & Leonardelli, 2001). Thus we first examined the effect of the IV on the DV (Model 1), then we conducted a second analysis in which we added the mediator to the model (Model 2; see Figure 3). To test whether the mediator significantly carried the influence of the IV to the DV, we conducted the Goodman (I) version of the Sobel test (Baron & Kenny, 1986). Fit measures for all mediation models can be found in Table 4.

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<sup>16</sup> We will not present the results of Step 2 in detail (e.g., the effect of PFI scores on Self-Efficacy). However, we investigated this effect prior to Steps 3 and 4.

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Insert Figure 3 about here  
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For the Romantic decision, PFI scores significantly predicted Avoidant coping,  $\beta = 0.26(0.08)$ ,  $t$ -value = 3.39. Then we added Self-Efficacy to the model and PFI scores were significantly related to Self-Efficacy,  $\beta = -0.45(0.06)$ ,  $t$ -value = -7.19, as was Self-Efficacy to Avoidant coping,  $\beta = -0.27(0.09)$ ,  $t$ -value = -3.23. The influence of PFI on Avoidant coping became nonsignificant, decreasing from  $\beta = 0.26$  to  $\beta = 0.15(0.09)$ ,  $t$ -value = 1.63, suggesting that mediation had taken place. A significant Sobel test,  $z = 2.92$ , supported the mediation hypothesis. For the School decision, the influence of PFI on Avoidant coping decreased yet remained significant in the second model, from  $\beta = 0.39(0.07)$ ,  $t$ -value = 5.64 to  $\beta = 0.23(0.08)$ ,  $t$ -value = 2.72, suggesting that the addition of Self-Efficacy had partially mediated the relationship between PFI and Avoidant coping. A significant Sobel test,  $z = 3.79$ , supported a (partial) mediation model.

For the Romantic decision, PA scores significantly predicted Problem-Focused coping,  $\beta = 0.31(0.07)$ ,  $t$ -value = 4.41. But because Self-Efficacy was not significantly related to Problem-Focused coping, mediation could not take place,  $\beta = 0.08(0.08)$ ,  $t$ -value = -1.05. However, PA had a significant direct effect on Self-Efficacy,  $\beta = 0.24(0.07)$ ,  $t$ -value = 3.44. For the School decision, the influence of PA on Problem-Focused decreased yet remained significant in the second model, from  $\beta = 0.39(0.07)$ ,  $t$ -value = 5.86 to  $\beta = 0.31(0.07)$ ,  $t$ -value = 4.21. A significant Sobel test,  $z = 2.77$ , supported a (partial) mediation model.

The mediation tests thus revealed that, in most cases, PFI (PA) scores at least partially influenced avoidant (problem-focused) coping usage through self-efficacy appraisals (H2). Although positive affect significantly predicted self-efficacy appraisals and problem-focused coping behaviors across decision types, because self-efficacy appraisals did not influence problem-focused coping usage for the Romantic decision, self-efficacy appraisals could not possibly mediate the relationship between PA scores and problem-focused coping usage.

#### Effects of Self-Efficacy and Coping on Choice Characteristics

First, we investigated whether coping behaviors influenced choice characteristics directly. Individuals who engage more frequently in avoidant (vigilant) forms of coping may be more likely to make corresponding “avoidant” (“vigilant”) choices. Then, we conducted mediation

tests to verify whether appraisals affected choice characteristics through coping behaviors. We tested the structural equation models for each decision type in order to see whether the relationships among constructs changed across decision types.

Direct effects of coping on choice characteristics. Structural equation models included directional arrows from every form of coping to every choice characteristics (see Figures 4 and 5). As expected, Avoidant coping significantly predicted Avoidant choice,  $\beta = 0.40(0.07)$ ,  $t$ -value = 5.47, and  $\beta = 0.33(0.08)$ ,  $t$ -value = 3.92 for both the Romantic and School decisions, respectively. Also as predicted, Problem-Focused coping significantly influenced Vigilant choice,  $\beta = 0.36(0.09)$ ,  $t$ -value = 4.27, and  $\beta = 0.66(0.09)$ ,  $t$ -value = 7.18 for both the Romantic and School decisions, respectively. Yet, Social Support coping failed, across decision types, to significantly predict choice characteristics.

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Insert Figures 4 and 5 about here  
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Mediation models. For the Romantic decision, Self-Efficacy was significantly related to Avoidant choice,  $\beta = -0.23(0.07)$ ,  $t$ -value = -3.26. We added Avoidant coping to the model and found significant effects of Self-Efficacy on Avoidant coping,  $\beta = -0.36(0.07)$ ,  $t$ -value = -5.09, and of Avoidant coping on Avoidant choice,  $\beta = 0.41(0.08)$ ,  $t$ -value = 5.30. The influence of Self-Efficacy on Avoidant choice became nonsignificant, from  $\beta = 0.23$  to  $\beta = -0.09$  (0.08),  $t$ -value = -1.11, suggesting that mediation had taken place. A significant Sobel test,  $z = -3.64$ , supported the mediation hypothesis. For the School decision, the influence of Self-Efficacy on Avoidant choice decreased yet remained significant in the second model, from  $\beta = -0.32(0.07)$ ,  $t$ -value = 4.60 to  $\beta = -0.17(0.08)$ ,  $t$ -value = -2.13. A significant Sobel test,  $z = -3.29$ , supported a (partial) mediation model.

For the Romantic decision, Self-Efficacy was significantly related to Vigilant choice,  $\beta = 0.35(0.07)$ ,  $t$ -value = 5.07. We then added Problem-Focused coping to the model, but because Self-Efficacy did not significantly predict Problem-Focused coping,  $\beta = -0.02(0.08)$ ,  $t$ -value = -0.32, mediation could not take place. For the School decision, the influence of Self-Efficacy on Vigilant choice decreased yet remained significant in the second model, from  $\beta = 0.48(0.06)$ ,  $t$ -value = 8.00 to  $\beta = 0.29(0.06)$ ,  $t$ -value = 4.56, and a significant Sobel test,  $z = 4.35$ , supported a (partial) mediation hypothesis.

Across decision types, reliance on avoidant (problem-focused) forms of coping was significantly associated with avoidant (vigilant) choice characteristics. Yet, social support coping failed to significantly predict choice characteristics. Mediation tests showed that, as predicted, reliance on avoidant (problem-focused) forms of coping at least partially mediated, in most cases, the relationship between self-efficacy appraisals and avoidant (vigilant) choice characteristics (H3). Once again, because self-efficacy appraisals did not significantly influence problem-focused coping usage for the Romantic decision (although self-efficacy was significantly related to vigilant choice), mediation could not take place.

#### Subjective Expected Utility (SEU) Framework

As described previously, participants provided two options or alternatives they were seriously considering as potential solutions to each of their decision problems. They also described two likely consequences of each option, gave a subjective probability estimate for each of the two consequences, and rated their “utility value.” The generation of consequences and the estimation of subjective probabilities and utilities was apparently a demanding and difficult task for the participants. That is, a number of participants mentioned having problems with the task or did not even answer the questions. We discarded erratic answers provided by a few individuals, as these respondents may not have taken the task seriously or may not have understood the instructions correctly. Two hundred thirty-nine to 250 participants (out of 260) provided answers for one of the four options, and only 226 individuals completed the questions for all four.

We computed individuals’ subjective expected utilities for each of the four options (i.e., two per decision type) as follows: (1) we multiplied the utility of the first consequence, a rating from 1 to 5, by its probability estimate, a probability between 0 and 100; (2) we multiplied the utility of the second consequence by its probability estimate; and (3) we added the utility values obtained in (1) and (2) to obtain an overall utility for the option under consideration<sup>17</sup>. Once we had computed an overall utility for each option, we used the utility values to predict choice. That is, if the utility of Option A was greater than the utility of Option B, we coded Option A as being the predicted choice from an SEU standpoint (and vice-versa). The participants’ actual and

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<sup>17</sup> Whenever the sum of the probability estimates was greater than 1 for a given option, we transformed the probabilities so that their sum would equal 1. Some participants described three consequences instead of two for an option in which cases the expected utility of the option was computed based upon the three consequences.

predicted choices were significantly correlated<sup>18</sup>,  $r_{\phi} = 0.38$  ( $N = 210$ ) and  $r_{\phi} = 0.40$  ( $N = 229$ ) for the Romantic and School decisions, respectively, so the SEU framework moderately captured which option individuals actually chose in the study's real-life decision making task<sup>19</sup> (H5).

## Discussion

### Hypotheses and Summary of the Results

Our objectives were to apply Lazarus and Folkman's (1984) model to decision problems from different domains of life, to replicate results from the stress and coping literature, and to investigate relationships among problem type, person factors, appraisals, coping, and choice in decision making situations. To that effect, the following hypotheses were tested:

- H1. Appraisals predict coping.
- H2. Person factors influence coping through appraisals.
- H3. Appraisals influence choice characteristics through coping.
- H4. Problem types affect relationships among appraisals, coping, and choice.
- H5. Predicted and actual choices of an option are positively correlated.

Mean ratings of appraisals, coping behaviors (except for social support), and choice characteristics significantly differed across decision types. These findings thus provide some evidence for the effect of the type of problem on an individual's appraisals and coping behaviors. They also extend earlier results by simultaneously investigating the effect of problem type on primary and secondary appraisals, coping behaviors, and aspects of a choice. This situation-specificity of stress and coping processes suggests that individuals evaluate and deal with stressful situations differently based on the type of decision they are facing. One can go one step further and predict that *because* individuals appraise situations differently, their coping behavior varies, or in other words, appraisal evaluations may at least partly explain cross-situational differences in coping patterns.

In the present study, only self-efficacy appraisals had a significant effect on coping behaviors when the three appraisal variables were included in the model as predictors. Terry

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<sup>18</sup> We used the phi coefficient as a measure of association, because both the actual and predicted choices were dichotomous variables without underlying continuous distributions.

<sup>19</sup> We investigated other methods to predict choice, using only the utilities of the consequences associated with each option (i.e., the maximax and maximin criteria), but only the maximax criteria yielded similar or greater correlations (than the ones reported above) between actual and predicted choices,  $r_{\phi} = 0.36$  ( $N = 162$ ) and  $r_{\phi} = 0.45$  ( $N = 160$ ) for the Romantic and School decisions, respectively.



(1991, 1994) found similar results, with situational self-efficacy accounting for more variance in cautiousness, escapism, and self-blame coping behaviors than primary appraisals of stressfulness. Interestingly, none of the appraisals significantly predicted social support coping, although respondents reported using social support quite a bit. Hence, reliance on social support may depend on other factors, as shall be described later.

Individual differences in positive affect and personal fear of invalidity, rarely incorporated into Lazarus and Folkman's (1984) model, significantly influenced both self-efficacy appraisals and coping behaviors across decision types, and self-efficacy appraisals at least partially mediated the relationship between these person factors and coping, in three out of four cases. That is, individuals approach decision-making situations with their particular "baggage" of traits and styles, which at least partly predict how they will evaluate and deal with stressful situations. Moreover, the fact that positive affect influenced problem-focused coping usage supports the results of ongoing research in J/DM relating affect to decision making and information processing (e.g., Isen, 1993).

Social support coping failed to significantly predict choice characteristics. Although reliance on a social network may alleviate the stress associated with a decision-making situation, it may not influence choice or choice characteristics per se. That is, individuals may rely on other people for emotional support, but this behavior does not necessarily have a clear connection to choice or choice characteristics. Other results have good face validity: avoidant (problem-focused) coping usage significantly predicted avoidant (vigilant) choice characteristics, across decision types. Self-efficacy appraisals also predicted choice characteristics, and their influence on aspects of the choice was, in three out of four cases, partly mediated through coping behaviors. Thus, the way an individual copes with a decision problem, which is often partly determined by his or her self-efficacy beliefs, apparently influences aspects or qualities of his or her choice.

Relationships among appraisals and coping behaviors differed across decisions: self-efficacy and challenge appraisals were significantly correlated only for the School decision, as were self-efficacy appraisals and problem-focused coping usage. Lower challenge appraisals may not trigger strong enough reactions to be related to self-efficacy appraisals (or vice-versa), and only high self-efficacy ratings may influence problem-focused coping as it was the case for the School decision (i.e., there may be some "threshold" effect). These findings extend previous

research in that they uncover the simultaneous effects of threat, challenge, and self-efficacy appraisals on coping across decision problems.

Finally, the participants' actual and predicted choices were moderately correlated. The SEU framework, as utilized in the study, captured, to a certain degree, which option individuals actually chose in a real-life decision-making task.

### Limitations of the Research

It is theoretically justifiable to assume that person factors influence appraisals which then partly explain coping behaviors, which in turn help predict choice. The order in which the data were collected provides additional support for that chain of causal relationships. However, due to the correlational nature of the design, directional statements should be made with caution, and we acknowledge that alternative models could have fitted the data as well as the ones investigated.

Our investigation of coping processes does not fully capture the richness of Lazarus and Folkman's (1984) model, which assumes that relationships among constructs are reciprocal and unfold over time. Due to the complex nature of such a process and its measurement, the present research provides only a "snapshot" of the relationships among the constructs at some fixed points in time. Had the measures been taken one or two weeks apart instead of three, results may have been different, as individuals may have perceived and/or acted upon their decisions in a different fashion<sup>20</sup>.

We decided to focus on real-life decision-making situations in an attempt to present a more realistic experimental task and increase external validity. However, the use of real decision problems involve some trade-offs. Most obviously, there is the risk that participants fabricated decisions for the sole purpose of the experiment. Manipulation checks and a careful inspection of all reported decisions may not have entirely prevented that from happening here.

Statistical power with respect to the fit of some of the measurement and mediation models was also problematic. These models were associated with few degrees of freedom and sample sizes of about 250 respondents. The power of the test of close fit (i.e.,  $H_0: RMSEA \leq 0.05$  vs.  $H_1: RMSEA = 0.08$ ) was only 0.41 for one of the mediation models,  $\chi^2(13, N = 244) = 32.62$ ,  $RMSEA = 0.079$  with a 90% CI of (0.045, 0.113), suggesting that the null hypothesis had a

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<sup>20</sup> Individuals who had resolved their decision(s) during the three-week interval differed from other respondents with respect to their appraisals, coping patterns, and qualities of their choice at Time 2. Participants who had resolved their decision(s) may also have reported their (a posteriori) preferred options instead of their actual choices. Thus post-decision biases, such as hindsight biases and counterfactual thoughts, may have contaminated their results.

rather high likelihood of being retained erroneously (MacCallum, Browne, & Sugawara, 1996). Similarly, the confidence intervals associated with some of the measurement and mediation models were large (e.g., (0.045, 0.113)), sometimes ranging from close to poor fit, and indicating substantial imprecision in assessing the degree of fit of the model in the population (MacCallum et al.).

Finally, as mentioned previously, all “tests” of measurement and structural invariance were descriptive. Provided large enough sample sizes, formal tests of measurement and structural invariance should have been conducted in order to assess whether there were significant differences in the measurement and structural models across decision types. In fact, it can be problematic to make cross-situational comparisons when measurement invariance has not been tested, although, in the present case, results of visual inspections suggest that the solutions of the various models were very similar across decision types.

#### Future Directions

First, the measurement models should be replicated, preferably using larger sample sizes. Further evidence for the reliability and validity of the scores with respect to related constructs should also be obtained. The use of measures with stronger psychometric properties may result in greater proportions of variance explained in coping behaviors and choice characteristics. In the present study, the percentage of variance accounted for in the dependent variables by the various models ranged from almost none to 45%.

One may further investigate the role played by social support coping in the decision-making process. No dependent variables significantly influenced reliance on social support in the present study, and social support usage did not significantly predict choice characteristics. The null results may have to do with the age of the respondents and the nature of the Coping Scale items. That is, research done by Carstensen (1995) suggests that social contact is motivated by a variety of goals and that the salience of specific goals changes depending on an individual’s place in the life cycle. In particular, regulation of emotions becomes more important over the life course, whereas acquisition of information becomes less salient. Thus, when dealing with a stressful decision, undergraduate students may be more likely to rely on social support for informational purposes, whereas older adults may be more likely to look for emotional support. The two functions of social support could not be distinguished adequately in the present study due to the nature of the scale items. However, it would be interesting to extend the present

research to samples of older adults and to compare young and older adults' coping and choice processes, using a more comprehensive instrument to assess social support behaviors.

Finally, we did not investigate the “adaptiveness” of coping patterns, although this line of research is particularly relevant to J/DM research and its preoccupation with “descriptive” versus “normative” theories. Folkman and Lazarus (1984) interestingly point out that effective coping means that the individual manages his or her negative feelings successfully, and that he or she deals with the source of the problem. However, they also acknowledge that in some situations, in which the problem is not amenable to change, strategies such as denial or distancing may alleviate distress. Thus, the beneficial impact of some coping strategies over others may vary across contexts, and the distinction between “adaptive” and “non-adaptive” coping strategies is not as clear-cut as it seems.

This discussion regarding the outcomes of appraisals and coping can be related to the issue of “rational” decision-making. That is, how *should* individuals make stressful decisions? One cannot help thinking that problem-focused coping and other so-called “rational” ways of dealing with a decision yield optimal choices. Conversely, avoidant behaviors may be associated with less optimal choices and outcomes (e.g., post-decisional regret). Future research should address these issues and try to identify if and when appraisals and coping patterns are associated with “better” decision and choice outcomes.

### Conclusions

With respect to stress and coping theories, our work has extended Lazarus and Folkman's (1984) framework to decision making situations and, more importantly, has linked choice processes to that model, not originally conceptualized as a model of choice. As such, the present research has succeeded in bridging distinct areas of psychology. This study has attempted to relate threat, challenge, and self-efficacy appraisals to coping and choice, and its results suggest that such appraisals do, in fact, play a role in determining how individuals deal with important decisions. Thus, the findings reported in this study demonstrate that stress and coping theories can be useful in explaining decision making processes and in predicting choice characteristics in a way that complements traditional theories of choice (i.e., expected utility models).

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Table 1

Exploratory Factor Analyses: Fit Measures

Model	$\chi^2$	<i>df</i>	<i>N</i>	RMSEA	90% CI
Appraisals					
Romantic	101.67*	42	289	0.070	(0.053, 0.088)
School	117.86*	42	289	0.079	(0.062, 0.096)
Coping Scale					
Romantic	138.77*	52	254	0.081	(0.065, 0.098)
School	132.00*	52	256	0.078	(0.061, 0.094)
Choice Scale					
Romantic	10.76	8	252	0.037	(0.000, 0.088)
School	13.31	8	253	0.051	(0.000, 0.098)

Note. CI = confidence interval around the RMSEA.

\*  $p < .05$

Table 2

Descriptive Statistics for the Measured Variables

Scale	Min.	Max.	Romantic			School		
			<i>M</i>	<i>SD</i>	<i>a</i>	<i>M</i>	<i>SD</i>	<i>a</i>
Time 1								
PA <sup>a</sup>	10	50	35.17	5.75	0.85			
PFI	14	64	50.70	9.14	0.91			
TH	1	6	4.40 <sup>b</sup>	1.30	0.90	4.10	1.18	0.86
CH	1	6	5.06	0.80	0.75	5.41	0.62	0.79
SE	1	6	4.44	1.02	0.87	4.76	0.86	0.85
Time 2								
PF	1	6	3.89	0.97	0.80	4.21	0.87	0.81
AV	1	6	3.11	1.12	0.71	2.91	1.12	0.74
SS	1	6	3.43	1.31	0.80	3.63	1.23	0.82
AC	1	6	3.41	1.41	0.73	3.01	1.18	0.68
VC	1	6	4.42	0.96	0.77	4.63	0.80	0.77

Note. PA = Positive Affect; PFI = Personal Fear of Invalidation; TH = Threat; SE = Self-Efficacy; CH = Challenge; PF = Problem-Focused coping; AV = Avoidant coping; SS = Social Support coping; AC = Avoidant choice; and VC = Vigilant choice. Min. and Max. represent the possible minimum and maximum values for the scales. Sample sizes range from 285 to 290 (Time 1) and from 250 to 254 (Time 2).

<sup>a</sup>The inventories are not content-dependent.

<sup>b</sup>All situational means differ significantly at  $p = .0091$  (one-tailed; correcting for multiple comparisons), with the exception of Social Support (SS) coping.

Table 3

Pairwise Pearson Correlations Among Measured Variables

Scale	PA	PFI	TH	CH	SE	PF	AV	SS	AC	NC
PA	1.00									
PFI	-0.26	1.00								

Romantic decision

TH	-0.04	0.27	1.00							
CH	0.17	-0.01	0.06	1.00						
SE	0.18	-0.41	-0.44	-0.01	1.00					
PF	0.31	-0.04	0.10	0.11	-0.02	1.00				
AV	-0.18	0.23	0.27	0.08	-0.32	-0.14	1.00			
SS	0.16	-0.05	0.02	0.07	0.05	0.45	-0.1	1.00		
AC	-0.03	0.05	0.14	-0.08	-0.15	-0.24	0.31	-0.21	1.00	
NC	0.23	-0.09	-0.17	0.11	0.27	0.34	-0.27	0.11	-0.19	1.00

School decision

TH	-0.02	0.14	1.00							
CH	0.16	-0.01	0.13	1.00						
SE	0.31	-0.42	-0.25	0.28	1.00					
PF	0.34	-0.24	-0.08	0.18	0.28	1.00				
AV	-0.19	0.33	0.19	-0.14	-0.38	-0.34	1.00			
SS	0.19	-0.08	-0.05	0.00	0.10	0.48	-0.1	1.00		
AC	-0.28	0.18	-0.02	-0.24	-0.26	-0.13	0.25	-0.02	1.00	
NC	0.22	-0.17	0.04	0.34	0.36	0.51	-0.32	0.23	-0.16	1.00

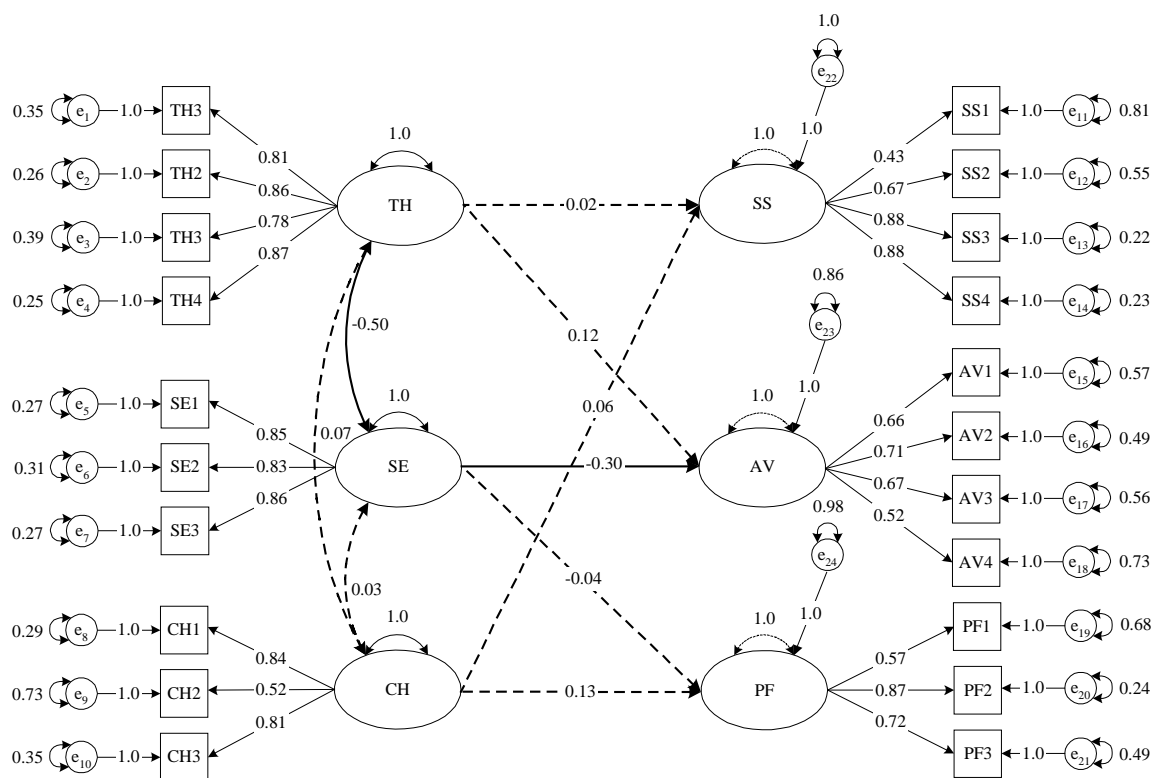
Note. Sample sizes vary from 248 to 259. Correlation coefficients greater than 0.11 in absolute value are significant at  $p < .05$ .

Table 4

Mediation tests: Fit Measures

Model	Romantic						School					
	$c^2$	<i>df</i>	<i>N</i>	RMSEA	90% CI	$R^2$	$c^2$	<i>df</i>	<i>N</i>	RMSEA	90% CI	$R^2$
Coping												
Avoidant												
Model 1	32.62 <sup>*</sup>	13	244	0.079	(0.045, 0.113)	0.07	11.59	13	247	0.000	(0.000, 0.057)	0.15
Model 2	56.93 <sup>*</sup>	32	244	0.057	(0.031, 0.080)	0.13	44.02	32	247	0.039	(0.000, 0.065)	0.24
Problem-focused												
Model 1	13.22	8	244	0.052	(0.000, 0.100)	0.10	11.45	8	247	0.042	(0.000, 0.092)	0.15
Model 2	29.97	24	244	0.032	(0.000, 0.064)	0.10	37.49 <sup>*</sup>	24	247	0.048	(0.011, 0.076)	0.20
Choice												
Avoidant												
Model 1	7.51	8	247	0.000	(0.000, 0.072)	0.05	8.81	8	250	0.020	(0.000, 0.079)	0.10
Model 2	54.37 <sup>*</sup>	32	247	0.053	(0.027, 0.077)	0.20	41.04	32	250	0.034	(0.000, 0.061)	0.17
Vigilant												
Model 1	16.34	13	247	0.032	(0.000, 0.075)	0.12	23.97 <sup>*</sup>	13	250	0.058	(0.017, 0.094)	0.23
Model 2	74.36 <sup>*</sup>	32	247	0.073	(0.052, 0.095)	0.25	53.76 <sup>*</sup>	32	250	0.052	(0.026, 0.076)	0.48

\*  $p < .001$



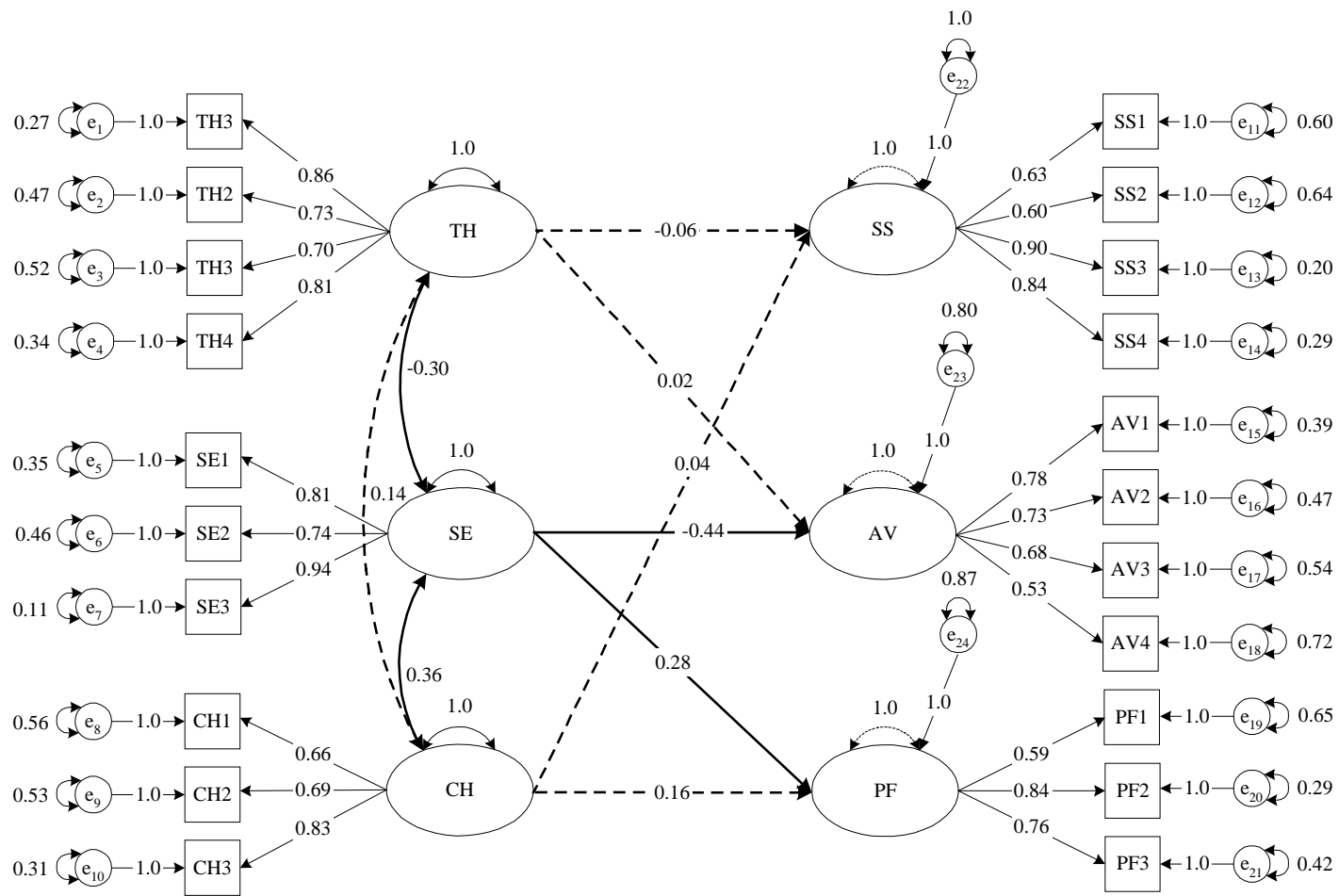
Model 1 (shown above):  $\chi^2(180, N = 250) = 394.27, RMSEA = 0.069, 90\% \text{ CI of } (0.060, 0.078)$

Model 2:  $\chi^2(182, N = 250) = 398.82, RMSEA = 0.069, 90\% \text{ CI of } (0.060, 0.078)$

$\chi^2_{\text{diff. Model 1-Model 2}}(2) = 4.55, p > .05$

Note. TH = Threat, TH1-TH4 = threat items; SE = Self-Efficacy, SE1-SE3 = parcels of items for Self-Efficacy; CH = Challenge, CH1-CH3 = challenge items; PF = Problem-Focused coping, PF1-PF3 = parcels of items for Problem-Focused coping; AV = Avoidant coping, AV1-AV4 = avoidant items; SS = Social Support coping, SS1-SS4 = social support items. Full lines represent paths (standardized coefficients) significant at  $p < .05$ .

Figure 1. Relationships Among Appraisals and Coping Behaviors for the Romantic Decision.



Model 1 (shown above):  $\chi^2(180, N = 251) = 357.70$ , RMSEA = 0.063, 90% CI of (0.053, 0.072).

Model 2:  $\chi^2(182, N = 251) = 361.25$ , RMSEA = 0.063, 90% CI of (0.053, 0.072)

$\chi^2_{\text{difference}}(2) = 3.55, p > .05$

Figure 2. Relationships Among Appraisals and Coping Behaviors for the School Decision.

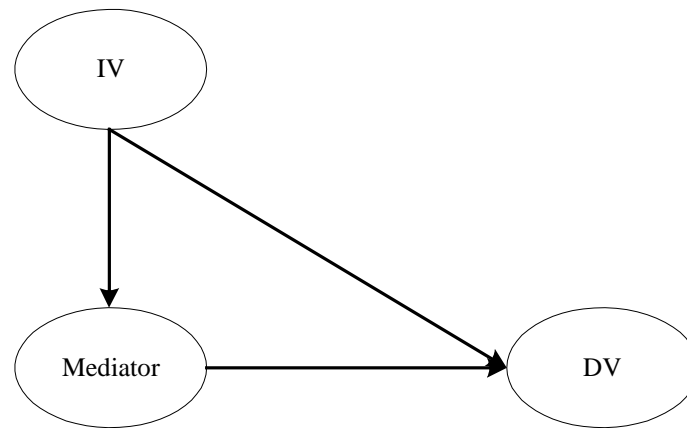
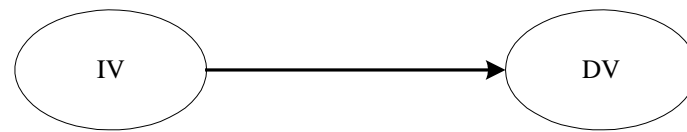
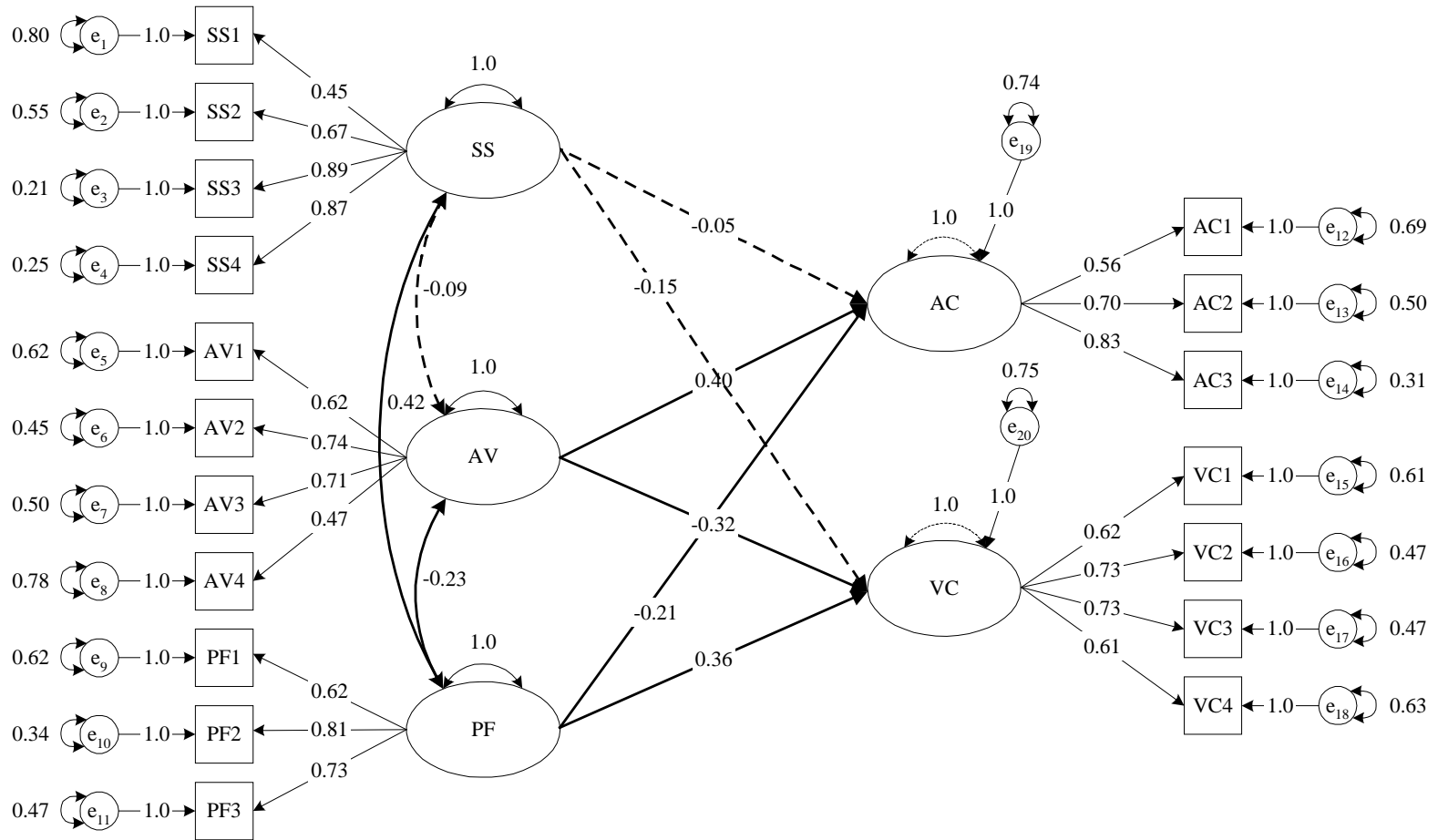


Figure 3. Mediation test (Model 1, top; Model 2, bottom).



$\chi^2 (126, N = 250) = 320.95, RMSEA = 0.079$  with a 90% CI of (0.068, 0.090)

Note. AC = Avoidant choice, AC1-AC3 = avoidant choice items; VC = Vigilant choice, VC1-VC4 = vigilant choice items.

Figure 4. Relationships Among Coping Behaviors and Choice Characteristics for the Romantic Decision.



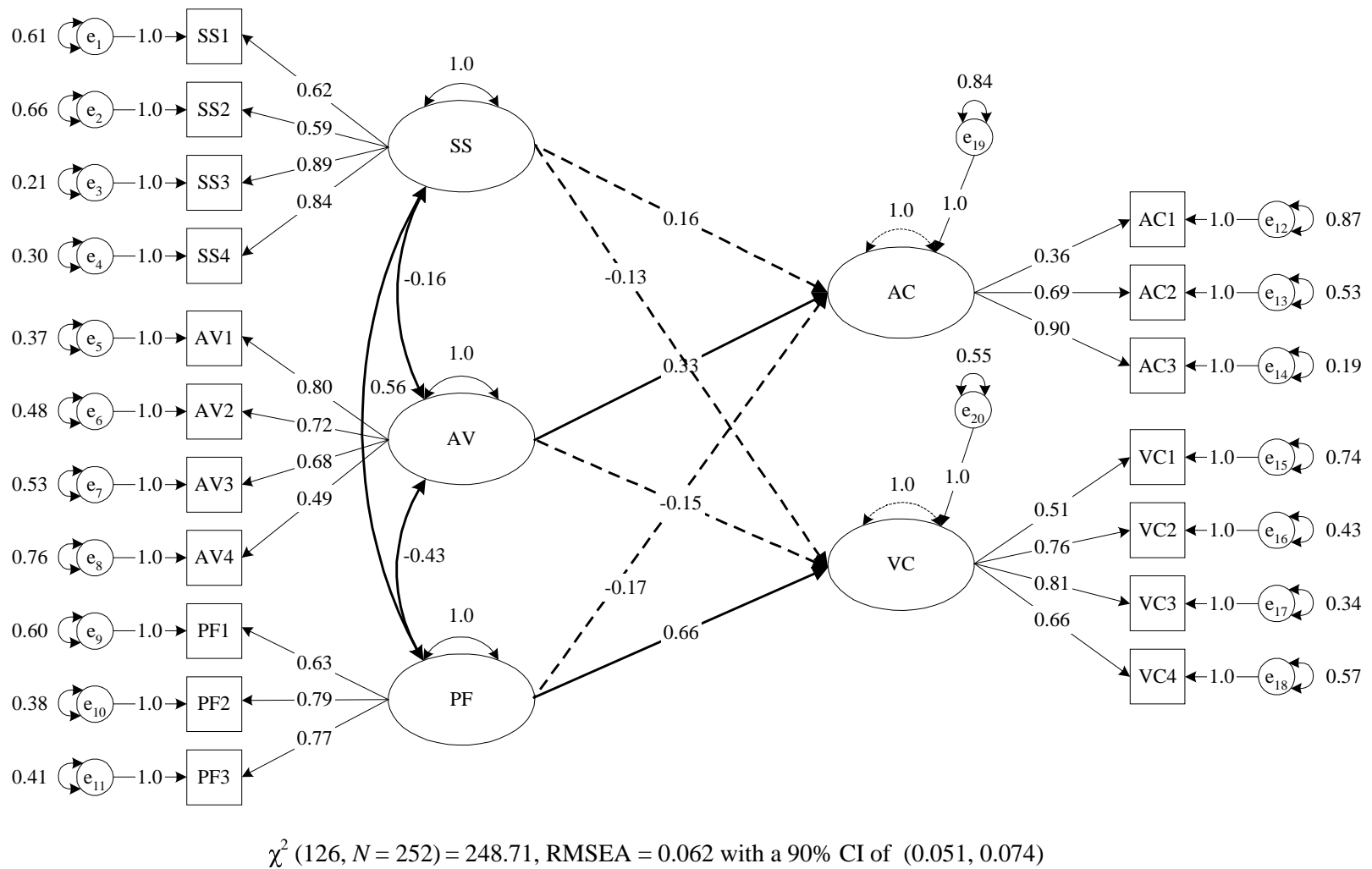


Figure 5. Relationships Among Coping Behaviors and Choice Characteristics for the School Decision.

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