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Refining the Conceptualization of an Important Future-Oriented Self-Regulatory

Behavior: Proactive Coping

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Abstract of the Dissertation

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Proactive coping has emerged as a new focus of research in the field of positive psychology. However, there are currently two distinct conceptualizations of and ways to assess this construct, creating confusion in how it is understood. Although these conceptualizations agree on the proposed self-regulatory process in which proactive copers engage, they disagree on whether proactive copers appraise the future in terms of goals to be met or stressors to be averted. Therefore, a first aim of this study was to examine how the two operationalizations of proactive coping differentially relate to salutary outcomes when included in the same analyses. A second aim was to determine through what mechanisms proactive coping leads to these outcomes. Participants were 281 undergraduates facing the stressor of an upcoming course examination. They completed the Proactive Coping Inventory (PCI; consisting of two subscales that each assess one of the conceptualizations), the Proactive Competence Scale (PCS; that assesses the proactive coping process), and measures of well-being and academic self-regulation. Structural Equation Modeling confirmed the superiority of a two-factor structure of the two subscales of the PCI, with one factor assessing the first conceptualization and the second factor assessing the second conceptualization. Only the first factor was significantly positively associated with well-being, whereas the unique variance in the second factor was not. Therefore, the current study supported the conceptualization of proactive coping that is based on a positively-focused striving for

goals and personal growth that is assessed with the proactive coping subscale of the PCI. Additionally, the addition of optimism to the final model revealed that Proactive Coping's unique variance was explained by two of the proactive competencies, use of resources and realistic goal setting, whereas the remaining variance associated with Well-being was accounted for by optimism. Thus, the mechanisms explaining proactive coping were best described by the authors of the second conceptualization and measured by the PCS. Finally, future research might focus primarily on use of resources and realistic goal setting in designing interventions to promote proactive coping.

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Behavior: Proactive Coping

"Yes, if this new science of happiness was to be taken seriously, it needed studies. But first, it needed a vocabulary, a serious jargon. The word 'happiness' wouldn't do. It sounded too frivolous, too easily understood. This was a problem. So the social scientists came up with a doozy: 'subjective well-being.' Perfect" (Weiner, 2008, p. 11). Proactive coping has emerged as a new term in the serious jargon of positive psychology and a new focus of research. It is predictive of outcomes such as functional independence, life satisfaction, and engagement (Bode, de Ridder, & Bensing, 2006; Gan, Yang, Zhou, & Zhang, 2007; Greenglass, Fiksenbaum, & Eaton, 2006; Greenglass, Marques, de Ridder, & Behl, 2005; Ouwehand, de Ridder, & Bensing, 2006; Ouwehand, de Ridder, & Bensing, 2007; Uskul & Greenglass, 2005). However, proactive coping's conceptualization has been guided by two similar, yet distinct, theoretical frameworks (Aspinwall, 2005; Aspinwall & Taylor, 1997; Schwarzer & Taubert, 2002). One definition used by Schwarzer and Taubert (2002) posits that proactive coping is a method of assessing future goals and setting the stage to achieve them successfully. Another definition proposed by Aspinwall and Taylor (1997) asserts that proactive coping is a process through which one prepares for potential future stressors, possibly averting them altogether. The fundamental similarity in these definitions is the notion that proactive coping is a general preparedness for an indeterminate future that incorporates both coping and self-regulatory skills. The distinction between the two is that the first definition frames the ambiguous future more positively, as a challenge for which one must prepare to ensure that it will go accordingly, whereas the second definition frames this future more negatively in that one must anticipate and prevent what may go wrong. Reconciling the inconsistent definitions of this important self-regulatory behavior would help to avoid confusion in the operationalization of this term and would foster more fruitful future research. In addition, these two definitions raise the question of, when preparing for an ideal future, whether the best strategy is to focus on how to reach desired goals or to concentrate on how to prevent unwanted events—or both.

Conceptualizations of Proactive Coping

Schwarzer and Taubert's (2002) Definition

Schwarzer and Taubert (2002) first define proactive coping by distinguishing it from other similar constructs such as reactive coping, anticipatory coping and preventive coping. They differentiate these behavioral constructs by their temporal location in the coping process and the level of certainty they involve. In this framework, proactive coping is directed toward future events, whereas *reactive coping* is directed toward past events. Proactive coping is also purported to take place before *anticipatory coping*, which occurs immediately before an event. Additionally, proactive coping occurs when the stressor to be encountered is less certain than the stressors that elicit reactive coping or anticipatory coping. However, proactive coping and preventive coping are quite similar with respect to their temporal position relative to a stressor and the level of certainty regarding that stressor, with proactive coping simply occurring in situations whereby the upcoming stressor is slightly more certain. Schwarzer and Taubert (2002) specify that proactive coping is based on preparing for possible positive appraisals of the future, whereas *preventive coping* is based on preparing for possible negative appraisals of the future.

Therefore, proactive coping is defined by these authors to be "an effort to build up general resources that facilitate promotion toward challenging goals and personal growth," as opposed to preventive coping that aims "to build up general resistance resources that result in less strain in the future by minimizing the severity of the impact, with less severe consequences of stress, should it occur, or a less likely onset of stressful events in the first place (Schwarzer & Taubert, 2002, p. 27)." In this conceptualization, a proactive coper will tend to appraise stressors as challenges and worry less, whereas a preventive coper will tend to appraise stressors as threats and worry more (Greenglass, 2002). Regardless of these appraisals and levels of worry, however, it is proposed that proactive coping and preventive coping manifest in a similar set of skills.

In summary, this definition of proactive coping is distinguished by three features: "(1) It integrates planning and preventive strategies with proactive self-regulatory goal attainment, (2) it integrates proactive goal attainment with identification and utilization of

social resources, and (3) it utilizes proactive emotional coping for self-regulatory goal attainment" (Greenglass, 2002, p. 41).

Aspinwall and Taylor's (1997)Definition

Proactive coping as defined by Aspinwall and Taylor (1997) is proposed to have many benefits, including reducing the impact of a stressful event, increasing the options available to handle the event by leaving enough time to do so, and possibly averting some stressful events altogether. In this conceptualization, proactive coping is a construct thought to describe how self-regulation is applied to preparing for future stressors. This preparation involves developing skills in order to anticipate potential stressors and to reduce their negative effects. Proactive coping is distinct from coping because it is not concerned with a specific stressor, but is a general preparedness to face challenges. The five stages of proactive coping as defined by Aspinwall and Taylor (1997) are: (1) resource accumulation; (2) recognition of potential stressors; (3) initial appraisal; (4) preliminary coping efforts; and (5) elicitation and use of feedback concerning initial efforts.

Similarities in the Conceptualizations

Although in the two conceptualizations there is a distinction made in the motivations behind proactive coping, these differences are expected to be apparent mostly in variations of an individual's appraisal of future stressors and level of worry (Schwarzer & Taubert, 2002). According to both of these perspectives, proactive coping works through similar mechanisms, as proposed by Aspinwall and Taylor (1997), and may manifest in the same behaviors (Greenglass, 2002).

Reconciliation and Operationalization

The currently-used measure of proactive coping, the Proactive Coping Inventory (PCI; Greenglass, Schwarzer, & Taubert, 1999), includes both a subscale that captures proactive coping as defined by Schwarzer and Taubert (2002), labeled the *proactive coping subscale*, and a subscale that captures proactive coping as defined by Aspinwall and Taylor (1997), labeled the *preventive coping subscale*. Thus, the confusion surrounding the definition of *proactive coping* begins with the names of the subscales in this measure. Because this measure was developed by the same group of researchers that proposed the first conceptualization of proactive coping (Schwarzer & Taubert, 2002),

the proactive coping subscale is consistent with their definition. The second conceptualization of proactive coping defined by Aspinwall and Taylor (1997) is referred to as preventive coping in the context of this measure. The other subscales of the PCI are not used widely, yet both the proactive coping subscale and the preventive coping subscale have been validated and included in several studies (Bode et al., 2006; Gan et al., 2007; Greenglass et al., 2006; Greenglass, 2002; Greenglass et al., 2005; Ouwehand et al., 2006; Ouwehand et al., 2007; Uskul & Greenglass, 2005).

Despite the fact that one team of researchers considers the term proactive coping to capture the notion of managing challenges (Schwarzer & Taubert, 2002), whereas another considers the term proactive coping to capture the notion of preventing threats (Aspinwall & Taylor, 1997), it is possible that both elements may be relevant when conceptualizing this construct. This would be similar to the manner in which other constructs, such as optimism or affect, often result in two factors when their measures are psychometrically examined. For instance, the positively-worded items on the Life Orientation Test (LOT-R; Scheier, Carver, & Bridges, 1994) generally ask about how much one expects that the future will work out positively ("in uncertain times, I usually expect the best"), whereas the negatively-worded items ask about how much one expects that the future will work out negatively ("if something can go wrong for me, it will"). Whether the LOT-R should be treated as if it assesses one factor or two is still debated (Roysamb & Strype, 2002), however, it is consistently implemented in its entirety as a measure of optimism. Similarly, affect, as measured by the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), has both a positive and a negative factor, but is also typically considered to represent a single construct with the two factors consistently measured simultaneously.

Future-Oriented Coping - Factor Structure

The notion that both conceptualizations of *proactive coping* are valuable and should be merged was supported by Gan et al. (2007). They included the proactive coping and the preventive coping subscales of the PCI as two factors in a measure of the general construct, *future-oriented coping* (The Future-Oriented Coping Inventory). This Chinese study found that the translated subscales did indeed form two distinct factors with independent predictive abilities. However, the model that included both the

proactive coping subscale and the preventive coping subscale was a significantly better fit than a single-factor model or a model that treated them as two unrelated factors. Therefore, this study supported the notion that, although it is more accurate to conceptualize the two scales as part of a higher-order construct, measured with the Future-Oriented Coping Inventory, there is still value in exploring the unique predictive ability of each subscale. Bode et al. (2006) also agreed that conceptually, proactive coping involves both the promotion of reaching goals and the prevention of undesired outcomes. In practice, however, these researchers have assessed proactive coping using only the preventive coping subscale of the PCI in their work.

Distinction between the Conceptualizations

According to the theory that distinguishes the two proposed definitions of proactive coping, proactive copers as defined by Schwarzer and Taubert (2002) will view an anticipated stressor in a positive light, as a challenge, whereas proactive copers as defined by Aspinwall and Taylor (1997) will view an upcoming stressor in a more negative light, as a threat (Schwarzer & Taubert, 2002). In an unpublished study mentioned in this chapter, those who scored high on the proactive coping subscale were higher in challenge appraisals and lower on threat and loss appraisals than those who scored lower on this measure. This study did not, however, assess how the preventive coping subscale was related to these appraisals (Schwarzer & Taubert, 2002).

Empirical Research Investigating Proactive Coping

Previous Applications of the First Conceptualization

The few studies that have investigated the predictive value of the proactive coping subscale of the PCI have found that it was significantly associated with various salutary outcomes. One study of rehabilitation patients established that the proactive coping subscale directly predicted the motivational variable, getting on with one's life, and indirectly predicted two behavioral outcomes, distance walked in two minutes, and functional independence (Greenglass et al., 2005). Also, a study of elderly people in Canada found that the proactive coping subscale was negatively associated with depression and functional disability and positively with social support, whereas proactive coping mediated the association between social support and functional disability (Greenglass et al., 2006). Proactive coping was also found to be positively correlated with

internal control, active coping, self-efficacy, and life satisfaction (Uskul & Greenglass, 2005).

Additionally, in a study exploring the influence of proactive coping and optimism on the well-being of Turkish immigrants in Canada, the researchers used a hierarchical regression analysis to establish that proactive coping, as measured by the proactive coping subscale of the PCI (Greenglass et al., 1999), significantly predicted depression and marginally predicted life satisfaction above and beyond demographic variables and optimism (Uskul & Greenglass, 2005). This demonstrates that it is valuable to determine the additional predictive value of proactive coping when taking the related construct, optimism, into account.

Finally, a study of the Chinese version of the PCI that included both the proactive coping and preventive coping subscales in the same analysis found that the proactive coping subscale had a significantly higher correlation with optimism than did the preventive coping subscale and, in separate analyses, that only the proactive coping subscale fully mediated the relationship between stress and student engagement (Gan et al., 2007). Thus, proactive and preventive subscales of the PCI appear to be differentially predictive.

Previous Applications of the Second Conceptualization

The research exploring the preventive coping subscale is limited. One review (Ouwehand et al., 2007) discussed how proactive coping is important to consider in models of aging. It also suggested that the general anticipation and minimization of potential stressors that is involved with proactive coping will enable the elderly to more effectively cope with the various challenges they may face. The proposed proactive coping theory expands on the previously used model that incorporates only a few specific preventive strategies.

A study exploring the predictors of proactive coping, as measured by different coping skills, presented vignettes to adults in the Netherlands to explore what situational and individual characteristics influenced their coping responses (Ouwehand et al., 2006). In this study, the preventive coping subscale was related to self-efficacy, future temporal orientation, and goal orientation. The situational variables in the vignettes, which were based on health, social relationships, and finance, all predicted different coping

responses. Individual variables, including a measure of preventive coping, did not predict coping responses, illustrating that the situation may have more of an influence on how people cope. Thus, it may be important to consider the situation participants are envisioning when responding to the preventive coping scale of the PCI.

Another study reported preliminary results from an educational intervention promoting proactive coping skills in aging adults (Bode et al., 2006). This four-session intervention was based on the process model of proactive coping, as proposed by Aspinwall and Taylor (1997). It used group discussions, individual goal setting, mental simulation, and feedback to successfully increase proactive competencies in total, but not proactive behavior (operationalized as taking initiatives and investment behavior) or scores on the preventive coping subscale.

The same intervention was evaluated further in a new sample of aging adults (Bode, de Ridder, Kuijer, & Bensing, 2007). This study found that the preventive coping subscale correlated with three of four assessed proactive competencies at baseline. These included *future appraisal*, *realistic goal setting*, and *use of feedback*, but not *use of resources*. The *use of resources* question primarily captured asking for social support and ability to listen to one's body. It is possible that, if other resources such as time management, health habits, a limited stress load, and the number of people available to help were assessed also, an association between use of resources and proactive coping might have emerged. This study also demonstrated the value of conceptualizing proactive coping as a set of skills. Each of these proactive competencies improved after the intervention. However, the study did not assess whether the proactive coping subscale predicted the proactive competencies, as well.

Proactive Coping as a Process

Understanding the mechanisms whereby proactive coping leads to positive outcomes would allow for the methods and results from already established successful interventions to be generalized to different populations or settings. Researchers who use Aspinwall and Taylor's (1997) conceptualization of proactive coping view it as a process and, therefore, a set of skills that a person has a tendency to use when preparing for the future. This conceptualization is similar to how Bolger (1990) explains the relationship between personality and the coping process can be understood; proactive coping is

considered to be where a personality type and a form of self-regulation meet, forming a general tendency to respond to stress with a certain process. In Bolger and Zuckerman's framework for studying personality and stress, the *differential exposure-reactivity model* (1995), proactive coping is proposed to influence both the exposure and reactivity to stressors. In their model of reactivity, proactive coping would be explained by *differential choice-effectiveness*, whereby proactive copers are proposed to have more coping resources available to them, presumably allowing them to make more effective choices.

Dispositional Coping Processes

One study that has taken this view defined self-regulatory skills as coping strategies, by altering the wording of four subscales from the COPE, active coping, planning, suppression of competing activities, and seeking social support for instrumental reasons, to apply to the future (Ouwehand et al., 2006). This operationalization of skills was not, however, significantly related to the measure of proactive coping, as assessed with the preventive coping subscale of the PCI.

A parallel theory on preventive coping independently proposed a notion similar to that of Aspinwall and Taylor (1997) stating, "With enough planning, resources and effort, many of life's travails can be minimized or negated" (McCarthy & Tortorice, 2005, p. 299). Although this theory is based on Adlerian ideas, the authors concur that preventive coping involves the resources available when meeting life's demands, the perceptions of these demands, and the perception of one's ability to deal with these demands. These roughly correspond with stages (1) resource accumulation; (3) initial appraisal; and (4) preliminary coping efforts in Aspinwall and Taylor's (1997) model. This alternate specification of preventive coping has led to the development of the Preventive Resources Inventory, which is divided into the four subscales of social resourcefulness, perceived control, maintaining perspective, and self-acceptance (McCarthy, Lambert, & Moller, 2006). This alternate theory even includes the idea of copers engaging in *encouragement of self-understanding or insight*, which is similar to Aspinwall and Taylor's (1997) stage (5), elicit and use feedback. The application of this theoretical formulation indicated that many of these ideas are useful in therapy sessions. Thus, it is encouraging that theorizing about preventive coping and proactive coping has converged.

Other researchers have more recently developed a measure of inherent skills associated with proactive coping, deemed *proactive competencies* (Bode et al., 2007). This set of competencies, *use of resources, future appraisal, realistic goal setting, and use of feedback* corresponds closely both theoretically with the definition proposed by Aspinwall and Taylor (1997) and empirically with the preventive coping subscale of the PCI. The proactive competencies' relationships to the proactive coping subscale and to salutary outcomes have not yet been established; therefore, this is a measure needing further evaluation.

Although the process model has only been explored in the context of proactive coping as defined by Aspinwall and Taylor (1997), the Schwarzer and Taubert (2002) definition of proactive coping states that proactive and preventive coping follow a similar process, suggesting that these manifested competencies, as well as situational processes, may be the same or at least similar for both conceptualizations (Greenglass, 2002).

Assessing the Proactive Coping Process

As suggested by Lazarus (1993), there is value in studying both the dispositional tendencies related to coping that generalize within an individual across situations and situational coping that varies with different situations. Considering dispositional and situational factors might create a more complete picture. Studies have found that dispositional coping and situational coping are related to each other, however, to varying degrees.

A study using both trait measures of coping and momentary assessments of coping found that trait measures only predicted 15-30% of actual reports of momentary coping (Schwartz, Neale, Marco, Shiffman, & Stone, 1999). This seems to indicate that trait coping may not be a useful proxy for the strategies that people actually use. Although this investigation used advanced methodology, there are three aspects of the way it was conducted that suggest that its findings may not apply to proactive coping. First, participants who experienced work or marital stressors frequently were selected to participate in the study, which inherently may exclude proactive copers, who in theory, prevent or minimize many of their potential life stressors (Aspinwall & Taylor, 1997). Second, the types of stressors brought to mind when filling out the trait measures may have been different than the ones experienced during the momentary assessments

(Schwartz et al., 1999). Accordingly, making one stressor salient to all participants, for instance, may minimize this concern. Third, since proactive coping is defined in a way that makes the distinction between self-regulation and coping less clear, proactive coping is considered as both a disposition and a process, which does not fall under the conceptualization of trait coping that was presented in the article.

Additionally, a study of university students found that personality was associated with both dispositional coping and situational coping (Bouchard, Guillemette, & Landry-Leger, 2004). These results also indicated that both the common variance between dispositional coping and situational coping and the remaining uncommon variance was additively predictive of psychological distress. Therefore, it may be valuable to test the relationship of proactive coping to both trait-like competencies and more state-like processes that represent the self-regulation process on different levels.

Situation-Specific Coping Processes

Another parallel line of research that is converging with proactive coping is one that examines the role of a proactive *personality* in the context of career success (Bateman & Crant, 1993; Kickul & Kickul, 2006; Seibert, Crant, & Kraimer, 1999; Seibert, Kraimer, & Crant, 2001). The Proactive Personality Scale used to assess this construct conceptually overlaps with the Proactive Coping Inventory with items such as "If I believe in an idea, no obstacle will prevent me from making it happen," which corresponds closely to an item such as "I always try to find a way to work around obstacles; nothing really stops me," from the PCI (Bateman & Crant, 1993; Greenglass et al., 1999). A relatively recent longitudinal study found that the proactive coping personality predicted career success through the mediators of innovation, political knowledge, and career initiative. These measures of what the authors term "proactive behaviors" are similar to the notion of proactive competencies, different largely due to the specific context to which they apply (Seibert et al., 2001, p. 857). To make proactive behaviors more analogous to the proactive competencies, one may view the innovation behavior as similar to a combination of future appraisal and use of feedback, political knowledge as similar to use of resources, and career initiative as similar to realistic goal setting.

Two studies applied the proactive personality to the academic context showing that it influenced students' exam scores, peer evaluations of academic performance, quality of learning, and satisfaction with a course (Kickul & Kickul, 2006; Kirby, Kirby, & Lewis, 2002); however, the mechanisms through which proactive coping operates in the academic context have yet to be explored. Studies of the self-regulation process specific to academic achievement have found that academic self-regulation is associated with positive outcomes related to both academic and health functioning (Ruban, McCoach, McGuire, & Reiss, 2003; Zimmerman, 1996). Academic self-regulation is the psychological processes and behaviors in which students engage when striving to meet academic goals. These processes and behaviors range from quite specific, including conceptual skills and routine memorization, to more general skills. In Zimmerman's general conceptualization "[academic] self-regulation requires proactive efforts to learn" (1996, p. 51) and includes six dimensions (1) goal setting and self-efficacy, (2) task strategies, (3) time management, (4) self-monitoring, (5) environmental structuring, and (6) selective help seeking (Zimmerman, 1998, p. 75). These aspects of self-regulation are analogous to stages of the model proposed by Aspinwall and Taylor (1997) such that (1) resource accumulation could encompass time management and selective help seeking, (2) attention recognition could be similar to environmental structure, since it involves screening for potential stressors in the environment, (4) preliminary coping is similar to goal setting and self-efficacy and task strategies, such that they are the activities engaged in to deal with the possible stressor, and (5) elicit and use feedback is similar to self-monitoring, since they both involve reflection on how the process is functioning. The corresponding components from the theories of self-regulation are presented in Table 1.

Proactive Coping and Adjustment

Theory and previous research suggest that proactive coping will influence affect, a greater sense of well-being, and academic achievement. Furthermore, this relationship will be explained by the self-regulation process, which is captured by constructs such as the proactive competencies (Bode et al., 2007) and the dimensions of academic self-regulation (Zimmerman, 1998).

Affect

Specifically, results from studies of related constructs imply that proactive coping would be positively related to positive affect and negatively related to negative affect. Although self-regulation is typically defined as a process, Diehl, Semegon, and Schwarzer (2006) suggest that there is a dispositional quality that predicts some aspects of self-regulation, especially attention control. Consistent with the process definition of self-regulation, a high score on attention-control was found to be positively related to positive affect and negatively related to negative affect assessed by the Positive and Negative Affect Schedule (Watson et al., 1988). Another study found that a construct related to proactive coping, optimism, was significantly positively related to positive affect, and negatively related to negative affect (Chang & Sanna, 2001). However, in a different study of students preparing for an exam, dispositional optimism was not significantly related to positive affect, but was significantly negatively related to negative affect (Rovira, Fernandez-Castro, & Edo, 2005). This supports the notion that positive and negative affect are two independent factors with unique associations to other psychological variables. The proposed difference in appraisals according to the two conceptualizations of proactive coping suggests that those who are higher on the proactive coping subscale will experience less worry (or negative affect) than those who score higher on the preventive coping subscale (Schwarzer & Taubert, 2002). There is no explicit suggestion for how positive affect will be related to the proactive and preventive coping subscales, therefore, there is no reason to expect a systematic difference between them in terms of predicting positive affect.

Additionally, in a previous study that explored the stress process, the authors proposed three stages of stress surrounding test taking; the anticipatory stage, a waiting stage, and an outcome stage (Folkman & Lazarus, 1985). The authors maintained that in each of these stages there is some shared experience by the students and some variability in their experiences. In the anticipatory stage of coping, students consider the upcoming stressor to be ambiguous and, therefore, often make threat or challenge appraisals simultaneously. That is, when the stressor is ambiguous, students experience a variety of emotions, and when the stressor becomes more defined or actually occurs, these emotions become more consistently positive or negative.

Subjective Well-being

Previous research also suggests that proactive coping predicts satisfaction with life. A study of Turkish immigrants in Canada found that proactive coping was related to satisfaction with life, as assessed by the Life Satisfaction Scale, and that this association remained marginally significant after controlling for demographic variables and optimism (Uskul & Greenglass, 2005). In addition, optimism, a construct considered to be an aspect of proactive coping, was significantly associated with satisfaction with life, as assessed by the Satisfaction with Life Scale (Chang & Sanna, 2001). In this study, both the positively-worded and negatively-worded subscales of the LOT-R (Scheier et al., 1994) used to assess optimism were similarly related to satisfaction with life. Thus, both the proactive coping and preventive coping subscales of the PCI are expected to follow this same pattern.

Physical Symptoms

Physical symptoms were also shown to be related to constructs similar to proactive coping. In a study of college students, Chang (1998) found that both primary and secondary appraisals of a stressor were associated with physical symptoms, as assessed by the Pennebaker Inventory of Limbic Languidness (Pennebaker, 1992). Also, the same study determined that optimism and pessimism predicted physical symptoms after controlling for appraisal and coping strategies. Optimism has consistently predicted symptom checklists (Scheier & Carver, 1985; Ustundag-Budak & Mocan-Aydin, 2005). Additionally, a writing intervention aiming to promote self-regulation strategies found that both being optimistic and engaging in a self-regulatory writing task inversely predicted number of visits to the medical clinic (Cameron & Nicholls, 1998). Since theoretically similar constructs are predictive of physical symptoms it is possible that proactive coping will be, as well.

Academic Achievement

Finally, previous research suggests that proactive coping may be associated with academic achievement. A common stressor whose effects are examined in the coping literature is an upcoming exam for college students. Proactive coping has been considered primarily of value in older populations (Ouwehand et al., 2007); however, the set of competencies involved in proactive coping is theoretically important throughout

the life-span. Proactive coping in college students is understudied compared to reactive coping. As discussed in previous studies considering an upcoming exam (Bolger, 1990; Ouwehand et al., 2006), studying this specific stressor is useful because it is a future stressor over which participants have some degree of control and is the same for all participants. Secondly, Ouwehand, de Ridder and Bensing (2006) suggest that it is of interest to explore proactive coping with upcoming stressors with different levels of ambiguity. Thus, an appropriate focus is a relatively certain, yet still ambiguous (Folkman & Lazarus, 1985), upcoming stressor that is commonly studied. Finally, an upcoming exam is a valuable focal stressor since it represents an objective outcome measure of exam score.

In a study of undergraduate students, academic performance, defined as a final score in a course, was not predicted by proactive coping (Diehl et al., 2006). Similarly, optimism did not predict grade obtained on an exam in a study of first-year college students in Spain (Rovira et al., 2005). Additionally, a study of premedical students assessed before and after an exam found that differences in personality and coping strategies did not significantly influence exam performance (Bolger, 1990).

Yet, a similar construct to proactive coping, the proactive personality, was significantly related to performance on three exams in a course and to peer evaluations of a student's performance (Kirby et al., 2002). This study also implemented an intervention to successfully increase students' levels of the proactive personality, supporting that this construct is not in fact measuring a stable disposition, but can be altered with training. Thus, this evidence further bolsters the possibility that the constructs of proactive personality and proactive coping are similar, and that proactive coping may be predictive of academic performance.

Also, a study of a mental simulation intervention found that students who were randomly assigned to mentally simulate the process of preparing for an upcoming exam performed significantly better than those who simply simulated their desired outcome (Pham & Taylor, 1999). This effect of simulation on exam score was partially explained by a negative association with anxiety and a positive association with planning and striving for a good grade. Since mental simulation of future events was demonstrated to be a form of self-regulation, it may be a skill that proactive copers naturally engage in.

This suggests that proactive copers could be similarly successful in preparing for upcoming exams. Therefore, although most research indicates that proactive coping will not predict exam performance, there is some theoretical indication that self-regulating effectively could improve performance.

Optimism

      Optimism is another important construct related to future self-regulation and is theoretically considered influential in stages 2-5 for facilitating proactive coping (Aspinwall & Taylor, 1997). Optimism is defined as an overall expectancy that the future will work out favorably (Scheier & Carver, 1992) and is associated with many positive effects, such as developing fewer physical symptoms, better responses to coronary artery bypass surgery, better birth outcomes, as well as being inversely related to depression (Lobel, DeVincent, Kaminer, & Meyer, 2000; Scheier & Carver, 1992). It has also been established that optimism is positively correlated with coping styles such as active, problem-focused coping and negatively correlated with disengaging from stressors (Scheier & Carver, 1992). Some of the beneficial outcomes related to optimism are thought to be driven by these coping mechanisms (Scheier & Carver, 1992).

      Previous research has indicated that, because optimists expect the future to work out well, they will be less threatened by negative information (Aspinwall & Taylor, 1997). This attitude could allow for a less defensive reaction to stage 2 of proactive coping, the *recognition of potential stressors*. Optimists are also better able to determine when a situation is controllable, know when to accept it and move on, and assess its importance (Aspinwall & Richter, 1999; Aspinwall, Richter, & Hoffman, 2001). These aspects of optimism allow a person to see a problem and know how to approach it, which would influence stage 3, *initial appraisal*. In addition, since optimists are more likely to use active coping strategies (Scheier & Carver, 1992), one could infer that their initial coping efforts in stage 4, *preliminary coping efforts*, would be more effective than a pessimist's initial coping efforts. Stage 5, *elicitation and use of feedback concerning initial efforts*, would work similarly to the initial appraisal in stage 2, whereby an openness to threatening information would enable constructive adjustment.

      In studies suggesting that proactive coping is associated with affect, satisfaction with life, and physical symptoms, optimism has also been related to these positive

outcomes (Chang & Sanna, 2001; Uskul & Greenglass, 2005). Thus, it is important to establish if proactive coping uniquely predicts salutary outcomes above that which is predicted by the shared variance of optimism and proactive coping. Prior work found that proactive coping remained marginally significant after controlling for demographic variables and optimism (Uskul & Greenglass, 2005), therefore, this association is in need of clarification.

The Current Study

An overarching aim of the current study was to clarify the conceptualization of the construct proactive coping and its measurement. In addition, the current study sought to determine the process through which proactive coping results in positive outcomes. To do so, the two definitions of proactive coping were examined simultaneously during the anticipatory stage of confronting an upcoming stressor. Here, the upcoming stressor was a scheduled exam in a psychology course; undergraduates completed relevant surveys online within a week before this exam. More specifically, the aims were to: (1) provide clarification of the conceptualization of proactive coping (2) quantify the differences in the two leading conceptualizations of proactive coping; (3) establish what dispositional self-regulatory strategies are used in proactive coping; (4) establish what situational self-regulatory strategies are used in proactive coping; (5) determine if proactive coping is related to academic achievement and well-being (6) examine how these dispositional and (7) situational strategies might explain how proactive coping is related to outcomes; (8) determine how the appraisals, and dispositional and situational strategies explain salutary outcomes when considered together; and (9) determine the unique predictive ability of proactive coping over and above optimism.

The Current Study Questions

Question 1: Does the factor structure of the proactive coping and preventive coping subscales of the Proactive Coping Inventory result in two related factors that create a stronger model when assessed together, as demonstrated in prior work (Gan et al., 2007)?

Question 2: Do both the proactive coping subscale and preventive coping subscale differentially predict initial appraisals of an upcoming stressor (here a future class exam)?

Question 3: Do both the proactive coping subscale and preventive coping subscale correlate with the same dispositional proactive competencies?

Question 4: Do both the proactive coping subscale and preventive coping subscale correlate with the same dimensions of academic self-regulation?

Question 5: Do both the proactive coping subscale and preventive coping subscale correlate with well-being and academic achievement?

Question 6: If the proactive coping subscale and preventive coping subscale correlate with well-being and academic achievement, are these associations explained by the proactive competencies?

Question 7: If the proactive coping subscale and preventive coping subscale correlate with well-being and academic achievement, are these associations explained by the dimensions of academic self-regulation?

Question 8: If the proactive coping subscale and preventive coping subscale correlate with well-being and academic achievement, how are these associations explained by appraisals, proactive competencies, and the dimensions of academic self-regulation?

Question 9: Do both the proactive coping subscale and preventive coping subscale uniquely correlate with outcomes when optimism is taken into account?

Planned Hypotheses and Analyses

Each of the following hypotheses was a step in the analysis leading to the final model proposed in Hypothesis 9. This allowed for each concept to be addressed individually and for each model to have optimal power.

Hypothesis 1 (stemming from Question 1) was that an American student sample would produce a similar factor structure for proactive coping to that found in a previous study with a Chinese student sample. This hypothesis was analyzed with a confirmatory factor analysis using Structural Equation Modeling. In this model, scores on the proactive coping subscale (measured by the latent variable, Proactive Coping) and the preventive coping subscale (measured by the latent variable, Preventive Coping) were predicted to represent two separate but related factors (Figure 1).

Hypothesis 2 (flowing from Question 2) was, first, that positive initial appraisals of an exam stressor, that deem it as important and challenging, will be significantly

related to Proactive Coping and not Preventive Coping and, second, that negative initial appraisals, that deem the exam as stressful and threatening, will be significantly related to Preventive Coping and not Proactive Coping. This hypothesis was assessed with an adaptation of the model for Hypothesis 1 that included these specific predictions for positive and negative appraisals (Figure 2).

Hypothesis 3 (following from Question 3) was that both Proactive Coping and Preventive Coping will predict all 4 of the proposed dispositional proactive competencies (use of resources, future appraisal, realistic goal setting, and use of feedback). This hypothesis was assessed with a structural equation model that included latent variables for Proactive Coping and Preventive Coping and measured variables for each of the proactive competencies (Figure 3).

Hypothesis 4 (exploring Question 4), that both Proactive Coping and Preventive Coping will predict all of the dimensions of academic self-regulation (time management, selective help, environmental structuring, self-efficacy, task strategies, and self-monitoring) was assessed with a structural equation model including the latent variables of Proactive Coping and Preventive Coping and measured variables of the dimensions of academic self-regulation (Figure 4).

Hypothesis 5 (stemming from Question 5), that both Proactive Coping and Preventive Coping will predict the outcomes of Well-being and exam grade, was assessed by determining if these subscales significantly predicted the latent variable Well-being (was a latent variable defined as high positive affect, low negative affect, high subjective well-being, and a lower number of physical symptoms) and the measured variable exam grade (Figure 5).

Hypothesis 6 (following Question 6), that these paths between the subscales and outcomes were mediated by the proactive competencies, was assessed by adding Well-being and exam score as outcomes to the model developed to test Hypothesis 3 (Figure 6).

Hypothesis 7 (stemming exploring Question 7), that these paths between the subscales and outcomes were mediated by the dimensions of academic self-regulation, was assessed by adding Well-being and exam score as outcomes to the model developed to test Hypothesis 4 (Figure 7).

Hypothesis 8 (stemming exploring Question 8), that the paths between the subscales and the outcomes were mediated by appraisals, the proactive competencies, and the dimensions of academic self-regulation, was assessed by adding together the models developed to test Hypotheses 2, 6 and 7 (Figure 8).

Hypothesis 9 (flowing from Question 9), that both Proactive Coping and Preventive Coping would remain significant predictors of the outcomes when optimism is taken into account, was assessed by adding optimism as a predictor for the model developed in Hypothesis 8 (Figure 9).

Method

Participants and Procedure

Three hundred participants were recruited with the incentive of course credit that was either required by their course or given as extra credit. These students were taking three different psychology classes, two introductory psychology courses and one research methods course. Prescreening by the computer system participants used to enroll in the study ensured that they were over 18 years of age and fluent in English. Participants provided informed consent and completed all questionnaires within the week before their second exam in their respective courses. Each participant completed the questionnaires online at one time point, which took less than one hour, through a secure survey program, PsychData (Locke & Keiser-Clark, 2001). Participants were told that the purpose of the study was to explore how the quality of exam preparation for psychology exams influences performance on these exams. They were then randomly assigned to four versions of the questionnaire that counterbalanced the question order for situational items related specifically to preparation for the exam. The dispositional measures were not expected to change based on the order in which they were asked. All procedures, forms, and measures were pre-approved by the Institutional Review Board.

Measures

Predictor Measures

The proactive coping measures were considered the main predictor variables of interest and their factor structure was considered with latent variables. Optimism was included as a measured variable to control for its variance, while minimizing the number of paths estimated and conserving power.

Proactive coping. Proactive coping was assessed by the proactive coping and preventive coping subscales of the Proactive Coping Inventory (Greenglass et al., 1999). The 14-item proactive coping subscale of the Proactive Coping Inventory (PCI; Greenglass et al., 1999) was used to assess the first definition of proactive coping (Schwarzer & Taubert, 2002) and the 11-item preventive coping subscale of the PCI was used to assess the second definition of proactive coping (Aspinwall & Taylor, 1997). Each item is assessed on a 4-point scale from 1 (*not at all true*) to 4 (*completely true*). An example of an item from the proactive coping subscale is "I try to pinpoint what I need to succeed," and an example of an item from the preventive coping subscale is "I plan for future eventualities." Internal consistencies for the proactive coping and preventive coping subscale were found to be 0.85 and 0.83, respectively in a previous study (Greenglass, 2002). Construct validity was also reported in previous samples whereby the proactive coping subscale was correlated positively with self-efficacy, internal control and negatively with depression, self-blame and behavioral disengagement, whereas the preventive coping subscale was positively correlated with another measure of preventive coping, internal control, and active copping and was negatively correlated with depression in one of two samples (Greenglass et al., 1999).

It was anticipated that preventive coping item 7, "I make sure my family is well taken care of to protect them from adversity in the future," would not apply to the current student sample, instructions were included for the participants to leave it blank if it did not apply. One hundred thirty-six participants did leave it blank and, therefore, it was omitted from the analyses. The final internal consistencies in the current sample were good for both the proactive coping subscale ($\alpha = .88$) and the preventive coping subscale ($\alpha = .85$).

Optimism. Dispositional optimism was determined by completion of the Life Orientation Test – Revised (LOT-R; Scheier et al., 1994). The LOT-R consists of 10 items whereby ratings are made on a 5-point scale from 0 (*strongly disagree*) to 4 (*strongly agree*). Three of the items are worded in a positive direction, (e.g., "In uncertain times, I usually expect the best"), three are worded in a negative direction (e.g., "If something can go wrong for me, it will"), and four are filler items. The negatively-worded items are reverse-coded in the scoring of this measure. The internal consistency was found to be 0.78 (Scheier et al., 1994) in a previous study and was similar in the current sample ($\alpha = .80$).

Mechanism Measures

All of the following mechanism measures were included as measured variables in the proposed models to minimize the estimated paths and, therefore, preserve power in the analyses. Additionally, individually assessing each of the proactive competencies and measures of academic self regulation enabled the exploration of potentially different patterns between what mechanisms were predicted by the proactive coping and preventive coping subscales.

Proactive Competencies. The Proactive Competence Scale (PCS; Bode et al., 2007) is a 21-item measure designed to capture the five phases of proactive coping as conceptualized by Aspinwall & Taylor (1997). These proactive coping behaviors are proposed to be similar regardless of how proactive coping is defined (Greenglass, 2002). Ratings on items assessing participants' reports of their abilities range from 1 (*not at all able*) to 4 (*very able*). The four factors that emerge from this scale have previously demonstrated adequate internal consistencies: *Use of resources* ($\alpha = .70$), *future appraisal* ($\alpha = .74$), *realistic goal setting* ($\alpha = .81$), and *use of feedback* ($\alpha = .76$; Bode, et al., 2007). An example item from the use of resources subscale is, "I am able to ask for support when things become difficult," an item from the future appraisal subscale is, "I am able to appraise my environment," an item from the realistic goal setting subscale is, "I am able to translate my wishes into plans," and an item from use of feedback is "I am able to learn from setbacks." The internal consistencies for these subscales in the current sample were also adequately strong (use of resources, $\alpha = .81$; future appraisal, $\alpha = .67$; realistic goal setting, $\alpha = .88$; and use of feedback, $\alpha = .85$).

Appraisals. Appraisals were assessed with a two-factor measure developed by Ptacek, Smith and Dodge (1994) and adapted by Chang (1998). The first factor, *primary appraisals*, consisted of four items of this measure that asked how important, stressful, challenging, and threatening the participant expects the upcoming exam to be, with responses raging from 1 (*not at all*) to 7 (*extremely*). The internal consistency for this factor was found to be .75 in a previous study (Chang, 1998) and was not calculated for the current study because the items were assessed individually. The individual assessment of these items allowed for the exploration of proposed differences in initial appraisals between the two conceptualizations. The second factor, s*econdary appraisals* consisted of two items, *"How effectively did you feel you are able to prepare for the Psychology exam?"* rated on a scale of 1 (*not at all effectively*) to 7 (*very effectively*) and "How much control do you feel you have over the outcome" rated on a scale of 1 (*no control*) to 7 (*complete control*). The internal consistency for this factor was .66 in a previous study (Chang, 1998) and was similar in the current study (α = .68).

Time management. Time management was assessed with two items developed specifically for this sample and therefore, this measure has not been previously validated. The first item, "Do your plan your classes for the semester so that they vary in difficulty?," was rated on a scale of 1 (*not at all*) to 4 (*always*). The second asked, *"To what extent do you make time to study?,"* with response options including: *I don't study, I study when I find time, I plan to study but can't always stick to it, and I plan when to study and usually do*. The internal consistency for these two items in the current sample was low (α = .18).

Selective help seeking. Selective help seeking was operationalized as *social support* (Blake & McKay, 1986). A single-item measure found to be predictive of mortality was slightly altered for the sample and used to assess social support. The original wording of the item was, "How many people do you have near you that you can readily count on for help in times of difficulty, such as to watch over children or pets, give rides to hospital or store, or help when you are sick?" with the response options of 0, *1, 2-5, 6-9,* or *10 or more*. Specifically, the alteration was that "watch over children or pets" was changed to "borrow notes." Concurrent validity was established between this single item and a 12-item index assessing social support.

Environmental structuring. Environmental structuring items were developed for this study based on the specific sample of participants who were students. The first asked "How many credits are you taking this semester?" with the response options of less than *12, 12-15, 16-19*, and *more than 19*. The second item asked "How many hours do you work (if you have a job outside of school)?" with the response options of *I don't work*, *0-10*, *11-20*, or *20 or more*. The internal consistency of these items was negative, thus only the first item was used in the analyses. Reverse scoring and combining these items would not be conceptually capturing a more stressful environment.

Self-efficacy. Self efficacy was assessed with the second factor from the measure of appraisals discussed previously (Chang, 1998).

Task strategies. Task strategies were assessed by two items developed for the current sample. These items were *"To what extent did you read since the last test?"* with the possible responses of 1 (*I didn't read at all*), 2 (*I just read right before the exam*), 3 (*I mostly kept up with the reading*), 4 (*I read before each class*) and "How regularly do you attend lectures?" with the possible responses of 1 (*I just attend for the exams*), 2 (*I attend about 1/3 of the time*), 3 (*I attend about 2/3 of the time*), 4 (*I attend almost every class*). The internal consistency for these items was low ($\alpha = .36$).

Self-monitoring. Self-monitoring was assessed with one item developed for the current study asking, "What statement is true of your study habits based on your previous performance?" with the possible responses of 1 (*my study habits <u>did not</u> change because I <u>was</u> satisfied*), 2 (*my study habits <u>did not</u> change even though I <u>was not</u> satisfied*), 3 (*my study habits <u>did</u> change because I <u>was not</u> satisfied*), 4 (*my study habits <u>did</u> change even though I <u>was</u> satisfied*).

Outcome Measures

The outcome measures of affect, subjective well-being and physical symptoms were combined into latent variable, Well-being, to capture the aspect that was shared by each of these constructs. Exam score was considered to be a conceptually unique measured variable.

Affect. Affect was assessed by the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). This measure asks participants how they felt "during the past week" by rating 20 adjectives such as "interested" or "distressed" on a scale ranging

from 1 (*very slightly or not at all*) to 5 (*extremely*). The PANAS is scored as two 10-item subscales. The positive subscale has been found to have an internal consistency of 0.86-0.90 and the negative affect subscale has an internal consistency of 0.84-0.87. Test-retest reliability was found to be 0.47 for both subscales and the PANAS has demonstrated adequate convergent and divergent validity (Watson et al., 1988). High internal consistency was found for both subscales in the current sample (positive affect, α = .92; negative affect, α = .88).

     Subjective well-being. Subjective well-being was assessed with the Satisfaction with Life Scale (SWL; Diener, Emmons, Larsen, & Griffin, 1985) to measure the cognitive aspect of an overall state of well-being. This scale consists of five items asking participants if they agree with statements such as, "In most ways my life is close to my ideal," on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). This widely-used scale has been found to have an internal consistency of 0.79-.89 and test-retest reliabilities of .50-.84, depending on the degree of time that had passed, ranging from two weeks to four years (Pavot & Diener, 1993). This suggests that it is relatively stable over a short period of time but sensitive enough to detect changes in satisfaction if they occur. A score of 20 on this scale is neutral; higher is more satisfied; and lower is less satisfied. The SWL scale shows basic validity, with groups with an anticipated lower satisfaction with life such as prisoners and abused women scoring low on this measure. Convergent and divergent validity have also been demonstrated with positive relationships to other measures of well-being, negative relationships to measures of distress, and unique variance from similar measures such as affect (Pavot & Diener, 1993). The internal consistency for this scale in the current sample was high (α = .90).

     Physical symptoms. Physical symptoms were assessed by the Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1992). This 54-item measure assesses commonly-occurring physical symptoms (i.e., eyes watering, sneezing spells) asking participants to indicate on a scale of A (*have never or almost never experienced the symptom*) through E (*more than once every week*) how often these symptoms occur. This measure also includes items asking participants to indicate in the past month, how many: Visits they have made to the student health center or private physician for illness, days they have been sick, and days their activity has been restricted due to illness.

Internal consistencies for the PILL were found to range from .88 to .91 (Pennebaker, 1992). This self-report measure will be used because medical records would not be easily accessible for students who primarily commute to campus and use various health providers. The internal consistency for this scale in the current sample was high ($\alpha = .95$).

Exam Score. The objective outcome, exam score, was evaluated by the psychology course instructors and converted to a z-score based on the overall class performance.

Demographics

The demographic variables assessed were age, sex, ethnicity, race, SAT score, and GPA.

Analyses

Structural Equation Modeling (SEM) with AMOS software was used in most of the analyses in this study (Arbuckle, 2007a). Some strengths of SEM as a statistical method are that (1) it allows for confirming a hypothesized model and for the drawing of inferences from this model rather than just an exploration of the data, (2) it generates values for error that is often not assessed in other procedures, and (3) it allows for the creation of latent variables representing theoretical constructs that cannot be measured directly, which is not possible with other methods (Byrne, 2001). Descriptive statistics were evaluated using SPSS version 16.0.

Results

Data preparation

Three hundred participants were administered questionnaires, however, 3 participants were not included due to screening failures. Only 4% of the participants did not complete the proactive coping and preventive coping subscales in their entirety. Listwise deletions were used for 2 of these participants because they did not complete two questions on either the proactive coping subscale (14 items) or the preventive coping subscale (10 items). Therefore, more than 10% of their data was considered missing at random for these central measures. In addition, one participant was missing more than

10% of the items on the PILL and was deleted, as well. Due to the nature of the AMOS software, it is not possible to assess normality, modification indices, or run a bootstrap test when there are missing values. Therefore, values were imputed with linear interpolation in SPSS for the remaining participants who were missing fewer than 10% of the items on the measures and for the other missing values in the data set.

To reduce skewness and kurtosis, the measured variables for parcel one and two of the proactive coping subscale, initial appraisal challenging, initial appraisal important, environmental structuring, and self-efficacy were transformed with a square root, the variables for task strategies and self-monitoring were transformed with the log function, and age was ranked. Different transformations were used depending on which transformation resulted in minimal skewness and kurtosis. A model including all of the measured variables used in any of the following analyses was run to assess the overall normality. Based on a significant Mardia's value of 32.76 with a critical ratio of 9.94, listwise deletion was also used for an additional 13 participants who were multivariate outliers with a Mahalanobis distance (observation furthest from the centroid) that was significant at the $p < .01$ level for both variables to obtain a more reasonable, yet still significant level of skewness and kurtosis for the measurement models (Arbuckle, 2007b). This resulted in a Mardia's coefficient (a measure of multivariate kurtosis) value of 16.83 with a critical ratio of 4.54. This critical ratio is standardized, thus, a value higher than 1.96 is considered significantly kurtotic (Arbuckle, 2007b). Although a critical ratio of 4.54 is still above the recommended ideal, because sample size inflates this value, it was deemed more important to not to delete more than 5% of the data than to achieve this rough guideline of significance. This resulted in an overall N of 281. Thus, when interpreting the results, it is important to consider that kurtosis may slightly influence the fit indices, such that the model is more likely to be a significantly poor fit (a more conservative estimate), and the regression coefficients may be likely to be deemed significant when they are not (Byrne, 2001). Parameter estimates and fit indices were estimated by the bootstrap technique as a comparison to the outcomes generated by the Maximum Likelihood method. The bootstrap method is less biased when the sample is nonnormal, whereas the Maximum Likelihood method is less biased when the sample is normal (Byrne, 2001). Additionally, the bootstrap parameters are most accurate with at

least a moderately-sized sample (Yung & Bentler, 1996), which is only a vague guideline for determining if this sample size is appropriate. Since the sample did not drastically violate the assumptions of normality and was perhaps smaller than the ideal size for the bootstrapping technique, both values were reported and the more conservative bootstrap values were interpreted.

Power Considerations

There are slight variations in the recommendations for how many participants are needed to achieve adequate power in structural equation modeling, with the general guideline being that larger samples are needed as more measured variables and parameters are included in the analyses. Most conservatively, it is recommended that there be over 100 participants to run a structural equation analysis, but over 200 is more widely suggested (Thompson, 2000; Ullman, 2001; Ullman, 2006). Additionally, one should aim to have 10-20 participants per measured variable in a model (Thompson, 2000) or approximately 10 participants per parameter (Ullman, 2001; Ullman, 2006). The power in structural equation modeling is also influenced by the effect size, which explains the variation in these conventions (see MacCallum, Browne, & Sugawara, 1996). Thus, even if the minimum sample size suggestion is met, more complex models may require an even larger sample size. The current analyses adequately meets these guidelines with a sample size over 200 ($N = 281$) and the most complex model having 16 measured variables (equivalent to approximately 17.5 participants per variable).

Structural Equation Modeling Techniques

The Maximum Likelihood estimation method was used to determine model fit for the reported values of the fit indices and estimates for the paths. The bootstrap ML method of estimation was used (on 500 samples, with a 95% confidence interval) to determine if any of these fit indices or paths varied greatly due to the fact that the overall model had a significant level of kurtosis (Byrne, 2001). This method gives both the maximum likelihood estimate based on the assumption of normality and a value generated by AMOS that approximates the standard error from the current sample that is not based on this assumption. Since the bootstrap method allows one to make inferences only about the current sample that are not as generalizable to other populations (Byrne, 2001), the Maximum Likelihood estimations were reported and it was noted if they

differed from the bootstrap estimates. Additionally, the Bollen-Stine corrected *p*-value for the chi-square test was given (Bollen & Long, 1993).

The fit indices used to determine the fit of each structural equation model indicate only if a model is a bad fit, not that it is the only good fit. Therefore, it is important that the proposed models be based on theory and aimed at confirming grounded hypotheses. One fit index used was the chi-square, which indicates whether or not a model is a significantly poor fit to the data (Byrne, 2001). The chi-square (χ^2) is not a clear indicator of model fit when the sample size is large. In this situation, the power is high and it is more likely that the model will have a significantly poor fit and be rejected. Another fit index used to interpret the proposed models that is not as sensitive to sample size was the root mean square error of approximation (RMSEA) that tests whether a model is a close fit to the data, rather than a perfect fit. An ideal RMSEA value for a model is 0.00, whereas a very good RMSEA value is below .05 and a good one is between .08-.10. The *p*-value for this index should also be nonsignificant for an adequate fit, preferably above .50. The third fit index used was the comparative fit index (CFI). This index adjusts the chi-square for the degrees of freedom; a CFI of greater than .95 indicates a good fit (Byrne, 2001).

Post-hoc analyses. Conceptually sound improvements in the models were made as suggested by the modification indices, such as by adding a meaningful path that may improve the overall fit (see Bentler, 1990; Byrne, 2001). To determine if the overall fit was indeed improved when one parameter was changed within a nested model, a chi-square difference test indicated the significance of this adjustment (Byrne, 2001). Additionally, if paths were not significant, they were dropped in order of their regression weights from smallest to largest. The influence of this modification was evaluated with a chi-square difference test, as well. For model comparison fit indices that take the parsimony of the model into consideration, the Akaike Information Criterion (AIC; Akaike, 1987) and the Bayesian Information Criterion (BIC; Raftery, 1993; Schwarz, 1978), were referred to, with lower values indicating an improved fit (Byrne, 2001; Loehlin, 2004).

Mediation analyses. To further explain the relationships among the variables in the final models, mediation analyses were conducted. Mediation occurs when the

predictor's effect on the outcome is explained by another variable (Baron & Kenny, 1986). Firstly, to explore mediation, it was established that the fit of the hypothesized model was superior to alternate models (Kelloway, 1998; Seibert et al., 2001). Structural Equation Modeling using the AMOS software is especially good for testing for mediation in smaller samples that are not normally distributed. It allows for bootstrapping estimates, which are considered to be superior to the Sobel's test that is intended for large samples (Cheung & Lau, 2008; Shrout & Bolger, 2002). Other advantages to using SEM over the traditional multiple regression techniques are that it is possible to use latent variables, to include more than one mediator in the model simultaneously, for measurement error to be accounted for in the mediator, and for all paths in the analysis to be included and tested simultaneously (Brown, 1997; Cheung & Lau, 2008). Additionally, it is possible to evaluate the proportion of variance mediated by dividing the indirect effect by the total effect, which allows one to determine the strength of the mediation (Shrout & Bolger, 2002). It is not appropriate to use Sobel's test in this context because it is based on independent effects from multiple regressions (Kenny, 2008). To determine the specific indirect effect for each mediator once the model was established, we removed one of the mediating variables and determined how this changed the indirect effects explained by the model (Brown, 1997). The bootstrap was set to 1,000 replications for the mediation analyses, as recommended (Cheung & Lau, 2008; Shrout & Bolger, 2002). Additionally, the bias-corrected bootstrap confidence intervals were reported because they are considered the best indicator of the significance level in mediation (Cheung & Lau, 2008).

Descriptive Statistics

Of the 281 participants included in the analyses, 59.4% were female with a mean age of 19.2 ($SD = 2.6$). The ethnic distribution of the sample was that 9.3% identified as Hispanic versus 90.6% as non-Hispanic. Additionally, 49.1% identified themselves as White, 29.5% as Asian, 4.6% as Black, 1.1% as American Indian, 1.1% as Pacific Islander, and 14.6% as Other. This was representative of the incoming class last year at Stony Brook University was 40% White, 17% Asian, 7% Black, 7% Hispanic, 29% Other ("Stony Brook University: Fast Facts", 2007). Means, standard deviations and intercorrelations of the other study variables are presented in Table 2.

Bivariate Correlations among Study Variables

In general, the correlations among the proactive coping subscale and the preventive coping subscale and the other study variables are in the expected direction. These subscales were correlated with each other ($r = .60$, $p < .001$) as well as with the other predictor variable, optimism ($r = .61$, $p < .001$ and $r = .23$, $p < .001$, respectively). The proactive coping subscale and the preventive coping subscale also both tended to be associated positively with the positive outcomes and negatively with the negative outcomes. Of particular note is the small, but significant, correlation of the preventive coping subscale with the objective outcome, exam score ($r = .12$, $p < .05$). The exam score is also negatively correlated with challenging ($r = -.19$, $p < .01$) and stressful ($r = -.14$, $p < .05$) initial appraisals as well as positively associated with time management ($r = .27$, $p < .001$), environmental structuring ($r = .16$, $p < .01$), and self-efficacy ($r = .28$, $p < .001$).

Hypothesis 1

The Proactive Coping Inventory. Each item on the Proactive Coping Inventory is based on a 4-point scale from 1 (*not at all true*) to 4 (*completely true*) with a highest possible score on the proactive coping subscale of 56 and on the preventive coping subscale of 40. In the current sample of American students in an introductory psychology course, the mean score on the proactive coping subscale was 42.25 ($SD = 6.13$) and on the preventive coping subscale was 26.63 ($SD = 4.33$; without item 7). This is comparable to the mean scores on the proactive coping subscale previously found in young adults ($M = 45.67$, $SD = 5.24$), middle-aged adults ($M = 44.73$, $SD = 5.85$), and older adults ($M = 43.86$ $SD = 5.53$; Diehl, Semegon, & Schwarzer, 2006). The mean score on the preventive coping subscale is lower than the approximately four-point expected difference from removing one item. This suggests that the current sample may be less likely to engage in preventive coping than two samples of adults with mean ages of 61, where the means of the preventive coping subscale were found to be 33.13 (SD = 6.92; Bode, de Ridder, Kuijer, & Bensing, 2007) and 33.89 ($SD = 7.20$; Bode, de Ridder, & Bensing, 2006)**.**

Confirmatory factor analysis. It is recommended that at least three indicators be used when defining a latent variable and noteworthy that the number of items predicting a

latent variable is more influential than how the items are parceled (Kit-Tai & Marsh, 2004). Thus, to conserve the number of paths estimated and to maintain a structure similar to that used in the Chinese sample that we wished to replicate (Gan et al., 2007), three parcels were used to represent each factor. For Proactive Coping, assessed with the proactive coping subscale, items 1-5 were in parcel one, items 6-10 were in parcel two, and items 11-14 were in parcel three. For Preventive Coping, assessed with the preventive coping subscale (without item 7), items 1-3 were in parcel one, items 4-6 were in parcel two, and items 8-10 were in parcel three. Although these parcels are divided differently than in the Chinese sample, this analysis is considered confirmatory because it is based on the two factor structure that was found in previous studies (Gan et al., 2007; Greenglass et al., 1999) and allowed the two factors to covary, as did the superior model in the Chinese sample (Gan et al., 2007). The proposed model is shown in Figure 1.

This hypothesized model was a good fit to the data as indicated by the fit indices, $\chi^2(8, N = 281) = 5.94$, $p = 0.65$; RMSEA = 0.00, $p = .92$; CFI = 1.00, and all paths were significant in the predicted direction. Mardia's coefficient for this model was 3.98 with a critical ratio of 3.40 indicating significant kurtosis. Bootstrap ML correction for bias did not change the significance of any of the parameters. In addition, the Bollen-Stein bootstrap adjusted p-value for the chi-square test was also not significant ($p = 0.71$). The final model is displayed in Figure 10. Post-hoc analyses, also tested in the Gan et al. (2007) study, used a chi-square difference test indicating that the hypothesized model was superior to a model with a single factor, $\chi^2_{diff}(1, N = 281) = 125.25$, $p < 0.001$, and a model with two unrelated factors, $\chi^2_{diff}(1, N = 281) = 127.71$, $p < 0.001$.

Hypothesis 2

Hypothesis 2 proposed that positive initial appraisals of an exam stressor, that deem it to be important and challenging, will be significantly related to Proactive Coping and not to Preventive Coping and, secondly, that negative initial appraisals, that deem it to be stressful and threatening, will be significantly related to Preventive Coping and not to Proactive Coping. A SEM model was proposed to test this hypothesis (Figure 2), however, as revealed by bivariate correlations (Table 3) the only significant association between Proactive Coping and Preventive Coping and the initial appraisals is that they were both significantly associated with appraising the exam as important ($r = .31$, $p <$

.001; $r = .22$, $p < .001$, respectively). Therefore, there was not an adequate amount of variance to explain to make a model necessary. Participants did on average also appraise the exam as challenging ($M = 5.27$), stressful ($M = 5.07$), and threatening ($M = 4.73$) with all means higher than the midpoint on a scale from 1 (*not at all*) to 7 (*extremely*). However, these other appraisals were not significantly related to either measure of proactive coping.

Hypothesis 3

The proposed model for Hypothesis 3 shows both latent factors of Proactive Coping and Preventive Coping predicting all four of the measured variables of the dispositional proactive competencies (Figure 3). This model was not a good fit to the data, $\chi^2(30, N = 281) = 130.71$, $p = .000$; RMSEA = .11, $p = .000$; CFI = .94; AIC = 200.71; BIC = 328.05. Therefore, exploratory post-hoc analyses were conducted. The highest modification index that was theoretically meaningful suggested that the path from the error term of the use of resources and the error term from future appraisal be allowed to covary. This significantly improved the model, $\chi^2_{diff}(1, N = 281) = 9.97$, $p < .01$. Further modification indices suggesting that the other error terms from the same scale be allowed to covary were implemented incrementally since it was theoretically likely they shared variance, errors from: future appraisal to use of feedback, $\chi^2_{diff}(1) = 4.04$, $p < .01$; future appraisal to realistic goal setting, $\chi^2_{diff}(1, N = 281) = 6.96$, $p < .01$; use of resources to realistic goal setting, $\chi^2_{diff}(1, N = 281) = 6.09$, $p < .01$; realistic goal setting to use of feedback, $\chi^2_{diff}(1, N = 281) = 28.67$, $p < .01$; use of resources to use of feedback, $\chi^2_{diff}(1, N = 281) = 38.56$, $p < .01$. When all of the error terms of the subscales of the PCC were allowed to covary, this resulted in a good model fit, $\chi^2(24, N = 281) = 36.42$, $p = .05$; RMSEA = .04, $p = .61$; CFI = .99; AIC = 119.01; BIC = 268.18. However, there were still nonsignificant paths in the model. Therefore, the one with the lowest regression weight, from Preventive Coping to realistic goal setting ($\beta = 0.01$), was removed first with no significant effect on the model, $\chi^2_{diff}(1, N = 281) = 0.004$, $p = ns$. This was followed by the removal of the path from Preventive Coping to use of feedback, ($\beta = 0.01$), $\chi^2_{diff}(1, N = 281) = 0.03$, $p = ns$, Preventive Coping to use of resources ($\beta = 0.07$), $\chi^2_{diff}(1, N = 281) = 0.77$, $p = ns$, and Preventive Coping to future appraisal ($\beta = 0.14$), $\chi^2_{diff}(1, N = 281) = 3.68$, $p < .01$. Although dropping the last path was a significant

change to the model, it remained a good fit, χ^2 (28, N = 281) = 41.06, p = .05; RMSEA = .04, p = .70; CFI = .99, and the comparative fit indices were lower than in the previous model (AIC = 115.06, BIC = 249.68). This model was significantly kurtotic (Mardia's coefficient = 8.69, critical ratio = 4.70), so a bootstrap ML analysis was run, as well. The bootstrap bias-corrected values indicated that the parameters remained significant and the Bollen-Stein bootstrap adjusted p-value for the chi-square test was also not significant (p = 0.14) supporting the fit of the final model (Figure 11).

Hypothesis 4

The proposed model for Hypothesis 4 (Figure 4) illustrates the latent variables of Proactive Coping and Preventive Coping both predicting all the measured variables of the dimensions of academic self-regulation (time management, selective help, environmental structuring, self-efficacy, task strategies, and self-monitoring). The proposed model was not a good fit to the data, χ^2(47, N = 281) = 87.78, p = .00; RMSEA = .06, p = .29; CFI = .96; AIC = 173.77; BIC = 330.22. The largest theoretically sound modification index suggested that the error terms from task strategies and self-efficacy be allowed to covary, χ^2_{diff} (1, N = 281) = 13.29, p < .01. These two measures asked questions specific to exam preparation, as did the time management items. Thus, these error terms were allowed to covary (as suggested by the modification indices, as well) with self-efficacy, χ^2_{diff} (1, N = 281) = 8.21, p < .01 and with task strategies, χ^2_{diff} (1, N = 281) = 8.15, p < .01. This led to a significantly improved model with a good fit to the data, χ^2(44, N = 281) = 58.42, p = .07; RMSEA = .03, p = .88; CFI = .99; AIC = 150.42; BIC = 317.78. Therefore, no additional modifications were implemented. However, there were some paths that remained nonsignificant. These were removed incrementally in order of the smallest regression weight to the largest. The first path removed was from Preventive Coping to self-efficacy (β = -0.03), with no significant change to the model, χ^2_{diff} (1, N = 281) = 0.06, p = *ns*. The next was Preventive Coping to selective help (β = -0.04), χ^2_{diff} (1, N = 281) = 0.13, p = *ns* followed by Preventive Coping to task strategies (β = -0.04), χ^2_{diff} (1, N = 281) = 0.16, p = *ns*, Proactive Coping to self-monitoring (β = 0.05), χ^2_{diff} (1, N = 281) = 0.41, p = *ns*, Preventive Coping to environmental structuring (β = -0.08), χ^2_{diff} (1, N = 281) = 0.59, p = *ns*, and Proactive Coping to environmental structuring (β = -0.05), χ^2_{diff} (1, N = 281) = 0.57, p = *ns*. The model remained a good fit to the data, χ^2(50, N = 281)

= 60.18, p = .15; RMSEA = .03, p = .96; CFI = .99; AIC = 140.18; BIC = 285.71.

Finally, the variable environmental structuring was not predicted by the variables in the

model, and thus was dropped from the analysis resulting in a more parsimonious fit,

χ^2(39, N = 281) = 49.76, p = .12; RMSEA = .03, p = .89; CFI = .99; AIC = 125.76; BIC =

264.02. The model was significantly kurtotic (Mardia's = 4.14; critical ratio = 2.05),

therefore a bootstrap ML analysis was used. The bias-corrected confidence intervals also

indicated that all of the paths in the model were significant, with the exception of the path

from Preventive Coping to time management with a corrected p-value of .06. Therefore,

the significance of this path should be interpreted with caution. The Bollen-Stine adjusted

p-value for the chi-square fit index indicated that it was reasonable to accept this model

(p = .17).

Hypothesis 5

Measurement model. The proposed measurement model of Well-being (Figure 13;

defined by the measured variables, positive affect, negative affect, subjective well-being,

and number of physical symptoms) was not a good fit to the data, χ^2 (2, N = 281) =

54.783, p < .001; CFI = .74; RMSEA = .31, p = .000. As suggested by one of the fit

indices, the error terms for positive affect and negative affect were allowed to covary.

Since these indicators were from the same measure, it made sense that they shared some

common error. This resulted in an improved model, but it was still not a good fit to the

data, χ^2 (1, N = 281) = 18.72, p < .001, CFI = .91; RMSEA = .25, p =.000. It was not

possible to apply any of the further modification indices because the model would

become just identified with the addition of any parameters and thus would not indicate a

model fit. Therefore, since the critical ratio for the difference between parameters

indicated that the paths from positive affect to Well-being and satisfaction with life to

Well-being were not significantly different, they were constrained to be equal. This

allowed for the one more alteration suggested by the fit indices, which allowed the error

terms of the two items predicting Well-being in a negative direction, negative affect and

physical symptoms, to covary. This resulted in a good fitting model, χ^2(1, N = 281) =

0.06 , p =.81; CFI = 1.0; RMSEA = 0.00 , p = 0.86 and was an improvement from the

previous model with a lower AIC of 26.06 (previous model AIC = 44.72) and BIC of

73.36 (previous model BIC = 92.02). The Mardia's coefficient for this model was 0.13

with a critical value of 0.16 indicating that this sample was not significantly kurtotic and thus met the normality requirements.

   Proposed Model of Hypothesis 5. The proposed model suggested that the latent variables of Proactive Coping and Preventive Coping predicted the outcomes of the latent variable Well-being and the measured variable exam score (Figure 5). The proposed model was a relatively good fit to the data, χ^2 (39, $N = 281$) = 59.20, $p = .02$; RMSEA = .04, $p = .68$; CFI = .98, however, exam score was not significantly predicted by Proactive ($\beta = -0.07$) or Preventive Coping ($\beta = .19$) and thus, was removed from the model to make it more parsimonious. Fit indices indicated that eliminating the variable of exam score resulted in an improved model (with exam score: AIC = 135.20, BIC = 273.45; without exam score: AIC = 116.89; BIC = 240.60). The resulting model was a good fit to the data, χ^2 (31, $N = 281$) = 47.54, $p = .03$; RMSEA = 0.04, $p = .64$; CFI = .99, with all paths significant, accounting for 55.1% of the variance in Well-being (Figure 14). Mardia's coefficient was 5.26 with a critical ratio of 2.85 indicating that this model was significantly kurtotic. Thus, the bootstrap ML method was run as a comparison. The confidence intervals also found all of the paths in the model to be significant with the exception of the percentile estimated path from Preventive Coping to Well-being with a p-value of .06. Therefore, the significance of this path should be interpreted with caution. Bollen-Stein bootstrap adjusted p-value indicated that it is reasonable to accept this model ($p = .08$).

Hypothesis 6

   The proposed model of Hypothesis 6 explored the dispositional mechanisms through which Proactive Coping and Preventive Coping are related to Well-being (Figure 6) and added the significant outcomes from Hypothesis 5 to the model that was developed by Hypothesis 3. The error terms of the two measures from the PCC (use of resources and realistic goal setting) were still allowed to covary (as in Hypothesis 3) and the error terms for the paths from positive affect to negative affect and negative affect to physical symptoms were allowed to covary (as in Hypothesis 5). This model was an adequate fit to the data, χ^2 (63, $N = 281$) = 98.19, $p = .003$; RMSEA = .05, $p = .68$; CFI = .98; AIC = 210.19; BIC = 413.94. However, it included nonsignificant paths. Nonsignificant paths from future appraisal to Well-being, ($\beta = -0.04$), χ^2_{diff} (1, $N = 281$) =

0.21, $p = ns$, and use of feedback to Well-being ($\beta = .04$), χ^2_{diff} (1, $N = 281$) = 0.17, $p = ns$, were dropped to create a more parsimonious model, χ^2 (65, $N = 281$) = 98.57, $p = .005$; RMSEA = 0.04, $p = .74$; CFI = .98; AIC = 206.57; BIC = 403.04, that accounted for 64.1% of the variance in Well-being (Figure 15). This model was also significanlty kurtotic (Mardia's value = 11.52, critical ratio = 4.56), so a ML bootstrap analysis was run. The bias-corrected significance values indicated that the parameters all remained significant and the Bollen-Stine adjusted p-value for the chi-square fit index indicated that it should be rejected ($p = .04$). However, the fit indices that are not as sensitive to sample size maintained that the model may be accepted.

Hypothesis 6 specifically proposed to explain how the relationship between Proactive Coping and Preventive Coping to Well-being is explained by the Proactive Competencies. Therefore, in the interest of understanding which variables help explain these paths, the proactive competencies that seemed to be acting as mediators, use of resources and realistic goal setting, were evaluated further (while the other variables that were not directly influencing Well-being, future appraisal and use of feedback, were dropped from the model). This model remained a good fit, χ^2 (47, $N = 281$) = 65.86, $p = .04$; RMSEA = .04, $p = .82$; CFI = .99. The bias-corrected significance values indicated that the parameters all remained significant and the Bollen-Stine adjusted p-value for the chi-square fit index indicated that the model was acceptable ($p = .09$). The fit of the partially mediated model was compared to two alternate nested models of full mediation, where there was no direct path allowed from Proactive Coping to Well-being, χ^2 (48, $N = 281$) = 84.71, $p = .001$; RMSEA = .05, $p = .40$; CFI = .98, and no mediation, where the paths from Proactive Coping to the mediating variables were constrained to zero, χ^2 (49, $N = 281$) = 284.64, $p = .000$; RMSEA = .13, p = .00; CFI = .85. The fully mediated model was significantly improved from the no mediation model, χ^2_{diff} (1, $N = 281$) = 18.85, $p < .01$, and the partially mediated model was signifantly improved from the fully mediated model χ^2_{diff} (1, $N = 281$) = 199.93, $p < .01$. Therefore, the partially mediated model was accepted and explained in detail.

The partially mediated model did meet the first condition in establishing mediation, that the path from the predictor to the mediator was significant since the direct paths from Proactive Coping to use of resources ($\beta = 0.50$, CI [.41,.60], $p < .01$) and

realistic goal setting (β = 0.78, CI [.72 , .84], $p < .01$) were significant. It also followed the second criteria since the unmediated total effect of Proactive Coping on Well-being was significant (β = .88, CI [.72, 1.06], $p < .01$). Thirdly, the paths from use of resources (β = 0.18, CI [.05, .32], $p < .05$) and realistic goal setting (β = 0.30, CI [.11, .50], $p < .01$) to Well-being were significant. Finally, the indirect effect of Proactive Coping on Well-being (β = .33 CI [.18, .46], $p < .01$) was significant and the proportion of variance between Proactive Coping and Well-being that was mediated was 37.5%, while the remaining 62.5% of the variance was explained by the direct effect of Proactive Coping on Well-being (β = .55, CI [.31, .82], $p < .01$). With realistic goal setting removed from the model (β = .04 [.07, .21], $p < 0.01$), the slight reduction in the total indirect effects indicated that 89% of the indirect variance was explained by realistic goal setting and 11% was explained by use of resources. Thus, the results from this model support that the effect of Proactive Coping on Well-being is partially mediated by use of resources and realistic goal setting.

Hypothesis 7

The proposed model of Hypothesis 7 explored the situational mechanisms through which Proactive Coping and Preventive Coping are related to Well-being (Figure 7) by adding the significant outcomes from Hypothesis 5 to the model developed by Hypothesis 4. This model was an adequate fit to the data, χ^2 (77, N = 281) = 107.46, p = .01; RMSEA = .04, p = .89; CFI =.98; AIC = 223.46; BIC = 434.49. However, this included nonsigificant paths. Thus, these were deleted incrementally starting with the path from task strategies to Well-being (β = 0.01), χ^2_{diff} (1, N = 281) = 0.01, p = *ns*. The next path removed from the model was self-monitoring to Well-being (β = -0.02), χ^2_{diff} (1, N = 281) = 0.06, p = *ns*, followed by the removal of the path from time management to Well-being (β = 0.03), χ^2_{diff} (1, N = 281) = 0.27, p = *ns*, and from Preventive Coping to Well-being (β = -0.19), χ^2_{diff} (1, N = 281) = 3.89, p = *ns*. This more parsimonious model remained an adequate fit to the data, χ^2 (81, N = 281) = 111.70, p = .01; RMSEA = 0.04, p = .91; CFI =.98; AIC = 219.69; BIC = 416.17. This model (Figure 16) accounted for 56.6% of the variance in Well-being. The Mardia's coeffiecient was 8.65 with a critical value of 3.21, indicating that the data was significantly kurtotic. Therefore, a bootstrap ML analysis was run with bias-corrected significance values for the parameters indicating

that they did remain significant with the exception of the path from Preventive Coping to time management ($p = .05$), thus this path should continue to be interpreted with caution. The Bollen-Stein adjusted p-value corroborated that the model may be accepted ($p = .08$).

Hypothesis 7 specifically proposed to explain how the paths between Proactive Coping and Preventive Coping to Well-being are explained by academic self-regulation. Therefore, in the interest of understanding which variables help explain these paths, the variables that seemed to be acting as mediators, selective help and self-efficacy were evaluated further (while the other variables, time management, task strategies and self-monitoring were dropped from the model). This model remained a good fit to the data, χ^2 (49, $N = 281$) = 67.20, $p = .04$; RMSEA = .04, $p = .86$; CFI = .99. The bias-corrected significance values indicated that the parameters all remained significant and the Bollen-Stine adjusted p-value for the chi-square fit index indicated that the model was acceptable ($p = .12$). The fit of the partially mediated model was compared to two alternate nested models of full mediation, where there was no direct path allowed from Proactive Coping to Well-being, χ^2 (50, $N = 281$) =158.90, $p = .000$; RMSEA = .05, $p = .43$; CFI = .97, and no mediation, where the paths from Proactive Coping to the mediating variables were constrained to zero, χ^2 (51, $N = 281$) = 89.40, $p = .001$; RMSEA = .09, $p = .00$; CFI = .91. The fully mediated model was significantly worse than the no mediation model, χ^2_{diff} (1, $N = 281$) = -69.6, $p < .01$), and the partially mediated model was signifantly improved from the fully mediated model, χ^2_{diff} (1, $N = 281$) = 91.7, $p < .01$. Although the no mediation model and partially mediated model can not be compared directly with a chi-square difference test, it was clear from the other fit indices that the partially mediated model should be accepted as the superior model and explored further.

The partially mediated model did meet the first condition in establishing mediation because the paths from Proactive Coping to selective help ($\beta = 0.13$, CI [.02, .26], $p < .05$) and to self-efficacy ($\beta = 0.26$, CI [.12, .39], $p < .01$) were significant. It also met the second criterion since the unmediated total effect of Proactive Coping on Well-being was significant ($\beta = .717$, CI [.611, .801], $p < .01$). Thirdly, the paths from selective help ($\beta = 0.18$, CI [.07, 30], $p < .01$) and self-efficacy ($\beta = 0.14$, CI [.002, .26], $p < .05$) to Well-being were significant. Finally, the indirect effect of Proactive Coping on Well-being ($\beta = .062$, CI [.022, .109], $p < .01$) and the proportion of variance mediated was

8.6%, whereas the remaining 91.4% of the variance was explained by the direct effect of Proactive Coping on Well-being (β =.66, CI [.547, .757], $p < .01$). In addition, the total indirect effect when selective help was removed from the model was $\beta = .038$, CI [.004, .083], $p < 0.05$, which showed that 5.3 % of the variance was explained by self-efficacy, leaving 3.3% to be explained by selective help. Thus, the results from this model suggest that a small percentage of the effect of Proactive Coping on Well-being is partially mediated by selective help and self-efficacy.

Hypothesis 8

Hypothesis 8 incorporates all significant mediating paths explaining how Proactive Coping predicts Well-being and aims to combine the dispositional measures of self- regulation (the proactive competencies) to determine if they predict Proactive Coping through the situational measures of similar constructs (academic self-regulation) with the inclusion of initial appraisals, as in proactive coping theory (Figure 8). The error terms of the two measures from the PCS (use of resources and realistic goal setting) were still allowed to covary (as in Hypothesis 3) and the error terms for positive affect to negative affect and negative affect to physical symptoms were allowed to covary (as in Hypothesis 5). This resulted in a model that was a good fit to the data, $\chi^2(82, N = 281) = 112.90$, $p = .01$; RMSEA = .04, $p = .92$; CFI = .98; AIC = 218.90; BIC = 411.73. Overall, the model accounted for 67.7% of the variance in Well-being (Figure 17). The sample was significantly kurtotic (Mardia's value = 13.21, critical ratio = 4.94), so bootstrap ML analyses were conducted. The bias-corrected confidence intervals also indicated that all of the paths in the model were significant with the exception of the path from important to Well-being, with a corrected p-value of 0.05. Therefore, the significance of this path should be interpreted with caution. The Bollen-Stine adjusted p-value for the chi-square fit index indicated that it was reasonable to accept this model ($p = 0.09$).

There was no significant indirect effect explained by the double-mediated paths in the proposed model (total effects = .934 [.77, 1.13], $p < .01$; direct effects = .931 [.75, 1.14], $p < .01$; indirect effects = .002 [-0.29, 0.35], $p = .93$). An alternate model that allowed each mediator to be included in the model singularly was an improved fit to the data, $\chi^2(80, N = 281) = 94.78$, $p = .12$; RMSEA = .03, $p = .99$; CFI = .99; AIC = 204.78; BIC = 404.86. This model was also superior to the nested model where the path from

Proactive Coping to the mediators was constrained to zero, χ^2(85, $N = 281$) = 368.75, $p = $ .000; RMSEA = .11, $p = .00$; CFI = .83, and in a model where complete mediation was predicted, χ^2(81, $N = 281$) = 113.51, $p = .01$; RMSEA = .04, $p = .90$; CFI = .98. The difference between the partially mediated model and the fully mediated model was significant, χ^2_{diff} (1, $N = 281$) = 18.73, $p < .01$, confirming that the partially mediated model be accepted. This model had the same level of kurtosis as the previous model, and the bias-corrected bootstrap estimates revealed that the path from self-efficacy to Well-being was no longer significant ($p = .05$), indicating that this path should be interpreted with caution. The Bollen-Stine bootstrap significance level confirmed that it was reasonable to accept this model ($p = .274$).

The partially mediated model showed that the singular mediating paths did explain 36.5% of the variance between Proactive Coping and Well-being (total indirect effects = .319, CI [.153, .468], $p < .01$), with the model accounting for 68.4% of the variance in Well-being, overall. The model further followed the conditions for mediation with significant paths from Proactive Coping to the mediators (use of resources, $\beta = .50$, $p < .01$; selective help, $\beta = .14$, $p < .05$; important, $\beta = .34$, $p < .01$; self-efficacy, $\beta = .28$, $p < .01$; realistic goal setting, $\beta = .79$, $p < .01$). Also, the unmediated total effect of Proactive Coping to Well-being was significant ($\beta = .873$, CI [.715, 1.060], $p < .01$), and the paths from the mediators to Well-being were significant (use of resources, $\beta = .17$, $p < .05$; selective help, $\beta = .16$, $p < .01$; important, $\beta = -.11$, $p < .05$; realistic goal setting, $\beta = .28$, $p < .05$), with the possible exception of the marginally significant pat from self-efficacy to Well-being ($\beta = .12$, CI [.003,.23], $p < .05$). Finally, the total effect of Proactive Coping to Well-being was reduced ($\beta = .554$ [.317, .841], $p < .01$) supporting partial mediation.

Hypothesis 9

Hypothesis 9 added a measured variable, Optimism, to establish if Proactive Coping predicts Well-being when optimism is included in the model. The proposed model (Figure 9) was an adequate fit to the data, χ^2 (92, $N = 281$) = 131.721, $p = .004$; RMSEA = .04, $p = .88$; CFI = .98; AIC = 251.72; BIC = 470.02. The paths from Preventive Coping to Well-being ($\beta = -0.05$), χ^2_{diff} (1, $N = 281$) = 0.25, $p = ns$, important to Well-being ($\beta = -0.07$), χ^2_{diff} (1, $N = 281$) = 1.65, $p = ns$, and Proactive Coping to Well-

being ($\beta = 0.11$), χ^2_{diff} (1, $N = 281$) = 1.08, $p = ns$, were not significant and were incrementally removed to create a more parsimonious model. The path from self-efficacy to Well-being ($\beta = 0.09$), χ^2_{diff} (1, $N = 281$) = 5.58, $p < .01$, was not significant, however, the chi-square difference test indicated that this significantly influenced the model. This test, like the other chi-square tests is influenced by sample size, therefore, this path was removed to create a more parsimonious model. This resulted in a model also with a good fit to the data, $\chi^2(96, N = 281)$ = 138.27, $p = 0.003$; RMSEA = .04, $p = .88$;CFI = .98; AIC = 250.27, BIC = 454.02. It was significantly kurtotic (Mardia's = 14.73, critical ratio = 5.15), but the Boostrap ML corrected values were all significant. The Bollen-Stine adjusted p-value still found the model to be a significantly bad fit to the data ($p = .045$), however the fit indices not as sensitive to sample size indicated that it was acceptable. Overall, this model (Figure 18) accounted for 73.5% of the variance in Well-being.

The fit of the fully mediated model was compared to two alternate nested models of partial mediation, where there is a direct path allowed from Proactive Coping to Well-being, χ^2 (95, $N = 281$) = 136.83, $p = .003$; RMSEA = .04, $p = .88$; CFI = .98, and no mediation, where the paths from Proactive Coping to the mediating variables were constrained to zero, χ^2 (100, $N = 281$) = 421.32, $p = .000$; RMSEA = .11, $p = .000$; CFI = .83. The fully mediated model was not significantly different from the partially mediated model model, χ^2_{diff} (1, $N = 281$) = 1.44, $p < .01$, thus the more parsimonious model is selected. Both of these models were clearly superior to the no mediation model. Therefore, the fully mediated model was accepted and explored further.

The fully mediated model did meet the first condition in establishing mediation because the paths from Proactive Coping to the mediators were significant (use of resources, $\beta = .51$, $p < .01$; selective help, $\beta = .16$, $p < .01$; important, $\beta = .32$, $p < .01$; self-efficacy, $\beta = .29$, $p < .01$; realistic goal setting, $\beta = .79$, $p < .01$). Additionally, the unmediated total effect of Proactive Coping to Well-being was significant ($\beta = .368$ [.250, .472], $p < .01$), and the paths from the mediators to Well-being were significant (use of resources, $\beta = .14$, $p < .05$; realistic goal setting, $\beta = .65$, $p < .01$), with the exception of important, self-efficacy, and possibly selective help ($\beta = .11$, $p = .05$). Finally, the total effect of Proactive Coping to Well-being was completely reduced ($\beta = .000$ [.000, .000], $p = ns$), explained by the total indirect effects ($\beta = .368$, CI [.250, .472],

p < .01), supporting mediation. Therefore, the variance from Proactive Coping that was not shared with Optimism appeared to be fully explained by use of resources, realistic goal setting, and possibly selective help.

Discussion

Summary and Discussion of Findings

In summary, proactive coping most closely followed the conceptualization proposed by Schwarzer and Taubert (2002) whereas its mechanisms were supportive of the theoretical framework proposed by Aspinwall and Taylor (1997). This was first illustrated by confirming a two-factor structure of future-oriented coping allowing for the shared variance between Proactive Coping and Preventive Coping. Next, there was no discernable difference between the appraisals associated with each measure. Additionally, having both subscales in the model in this manner allowed for the accounting of their shared variance, showing that the unique predictive ability of Proactive Coping was positively associated with Well-being, whereas the unique predictive ability of Preventive Coping was not associated with Well-being. Finally, the addition of optimism revealed that Proactive Coping's unique variance was explained by use of resources and realistic goal setting, whereas the remaining variance associated with Well-being was accounted for by optimism. Overall, this demonstrated that proactive coping was clearly associated with accumulating resources and a focus on goal setting, suggesting that aspiring for a positive future rather than preventing a negative one is distinctly predictive of well-being.

Future-Oriented Coping - Factor Structure

Hypothesis 1, that the American student sample recruited in the current study will produce the same factor structure for future-oriented coping found in a previous study with a Chinese student sample was confirmed. The parcels of items from the subscales of the PCI all had high loadings on the latent factors of Proactive Coping and Preventive Coping and there was a high correlation between the two factors. Also, comparisons to alternate models indicated that this model was the best fit. Thus, as suggested by Gan et

al. (2007), it is useful to refer to this combined measure as the Future-Oriented Coping Inventory, and to the first factor as Proactive Coping and the second factor as Preventive Coping. Additionally, since this structure has been identified in two cultures and the current sample had similar means and standard deviations to other samples that have completed these measures (Bode et al., 2006; Bode et al., 2007; Diehl et al., 2006), it is probable that this structure may generalize.

Distinction between the Conceptualizations

Hypothesis 2 was, firstly, that positive initial appraisals of an exam stressor, that deem it as important and challenging, will be significantly related to Proactive Coping and not Preventive Coping and, secondly, that negative initial appraisals, that deem it as stressful and threatening, will be significantly related to Preventive Coping and not Proactive Coping was not confirmed. Proactive Coping was significantly related to initial appraisals of the exam as important, however, Preventive Coping was also. Additionally, although the other initial appraisals were significantly related to each other, they were not significantly associated with Proactive Coping or Preventive Coping.

Perhaps assessing the emotional aspect of the appraisals as implemented by Folkman and Lazarus (1985) would have been a more accurate operationalization of the theory proposed by Schwarzer and Taubert (2002) that describes a challenge appraisal with the statement "the situation is experienced as pleasant, exciting and interesting" (p. 21). Thus asking participants about their experience of the challenge emotions, such as "confident, hopeful, and eager," in regards to the exam may capture this notion more successfully than the item "How challenging do you find the upcoming exam to be?" used in the current analysis.

Therefore, no clear conclusions may be drawn about the distinction between these definitions of proactive coping based on appraisals measured in the current study.

Assessing the Proactive Coping Process

Both Hypothesis 3 and Hypothesis 4 explored how proactive coping is related to the self-regulation process. Hypothesis 3 focused on the more dispositional measures of this process, whereas Hypothesis 4 focused on situationally specific measures of this process.

Hypothesis 3, that both Proactive Coping and Preventive Coping will predict all four of the proposed proactive competencies (use of resources, future appraisal, realistic goal setting, and use of feedback), was confirmed for Proactive Coping but not for Preventive Coping. All of the paths from Proactive Coping to the competencies were significant, however, when the variance that Preventive Coping shared with Proactive Coping was accounted for, it was not uniquely associated with these indicators of self-regulation. These results suggest that the proactive competencies that were developed based on the proactive coping theory proposed by Aspinwall and Taylor (1997), are more accurately measuring the aspects of self-regulation uniquely related to proactive coping as assessed by the proactive coping subscale. However, these competencies were previously assessed in conjunction with the preventive coping subscale (Bode et al., 2007). Therefore, the prior association found between the preventive coping subscale and these proactive competencies may have been due to the variance that the Preventive Coping shares with Proactive Coping. Furthermore, this model supports Aspinwall and Taylor's (1997) model for the self-regulation mechanisms used by proactive copers, even when using Schwarzer and Taubert's definition of proactive coping (2002). Greenglass (2002) proposed that this would be the case, but also speculated that the same process would occur for those engaging in preventive coping. Finally, in the complete model explaining the association of Proactive Coping with Well-being, only use of resources and realistic goal setting remain as significant mediators. Therefore, it is important to determine if these mechanisms remain the most important when explaining other outcomes, as well.

Hypothesis 4, that both Proactive Coping and Preventive Coping will predict all of the dimensions of academic self-regulation (time management, selective help, environmental structuring, self-efficacy, task strategies, and self-monitoring) was partially confirmed. Proactive Coping predicted time management, selective help, self-efficacy, and task strategies, but not environmental structuring or self-monitoring. Preventive Coping, on the other hand, predicted self-monitoring and perhaps time management, but not selective help, environmental structuring, self-efficacy, or task strategies. This analysis suggests that although Proactive Coping uniquely predicts selective help, self efficacy, and task strategies, monitoring one's behavior may be unique

to Preventive coping. Another study of academic self-regulation suggests that individual differences may differentially predict self-regulatory processes (Ruban et al., 2003). Also of note is that in the complete model explaining the association between Proactive coping and Well-being, these situational mechanisms do not remain as significant mediators. Therefore, it is of interest to explore if they are in fact, not explaining this relationship, if this result is due to the operationalization of these measures, or specific to the outcome of this study.

Proactive Coping and Adjustment

Hypothesis 5, that both Proactive Coping and Preventive Coping will predict the outcomes of Well-being and exam grade, was also partially confirmed. Proactive Coping was significantly positively associated with Well-being. However, Preventive Coping was negatively associated with Well-being, in a direction opposite to that which was predicted, although the significance of this path is not clear. Additionally, neither Proactive Coping nor Preventive Coping significantly predicted exam score in the model.

The finding that Proactive Coping was differentially predictive of outcomes from Preventive Coping was consistent with the only other study that assessed both the proactive coping subscale and the preventive coping subscale (Gan et al., 2007). However, even this study did not include both subscales in the same model simultaneously. Therefore, the current study is the first to suggest that Preventive Coping's proposed relationship with positive outcomes may be at least partially due to its shared variance with Proactive Coping. What remains unique to Preventive Coping seems to be a possible negative predictor of Well-being, perhaps related to the theorized sense of worry associated with Preventive Coping (Schwarzer & Taubert, 2002), however, this path is not clearly interpretable and becomes non significant in the final model. Therefore, although the path from Preventive Coping and Well-being appears statistically significant in some models due to slight differences in the variables included and not others, it will be interpreted as non significant for the remaining discussion.

The finding that Proactive Coping is not related to exam score was consistent with a previous study assessing this relationship (Diehl et al., 2006), but not with prior results whereby proactive personality predicted exam performance (Kirby et al., 2002). In this prior work, the exams were testing material taught in an intervention to promote the

proactive personality, therefore, proactive personality and exam performance may have been confounded. However, these authors controlled for measures of general mental ability, experience, and prior performance, which adds to the robustness of their results. Therefore, the relationship between Proactive Coping and academic performance remains inconclusive. Although here the correlation between Preventive Coping and exam score was small and was no longer present in the SEM model, it raises the possibility that Preventive Coping is a more successful predictor than Proactive Coping for some outcomes, such as those that are performance based, which were not optimally assessed or included in the current study.

Dispositional Coping Processes

Hypothesis 6, stating that the paths between the proactive coping subscales and Well-being were mediated by the proactive competencies was again partially supported. The effect of Proactive Coping on Well-being was partially mediated by use of resources and realistic goal setting in the current model, and fully mediated in the final model, whereas the other proactive competencies (future appraisal, use of feedback) did not meet the requirements for mediation.

In a previous study, Preventive Coping was positively related to all of the proactive competencies except for use of resources (Bode et al., 2007). The results from the current study suggested that it was the variance that Preventive Coping shares with Proactive Coping that explains this relationship, and that including the proactive coping subscale may reveal a positive relationship with the use of resources subscale, as well. Therefore, part of the unique aspect of Proactive Coping that predicts Well-being may be explained by both by use of social support resources and, to a greater degree, the ability to make realistic plans. This corresponds with the resource accumulation and preliminary coping stages of proactive coping as proposed by Aspinwall and Taylor (1997).

The finding that Proactive Coping is related to the use of resources is also consistent with previous work that has found an association between proactive coping and social support (Greenglass et al., 2006), except that in the previous study, social support was proposed to predict proactive coping, whereas proactive coping was in the middle of an indirect path to functional disability. In the same article, the authors suggested that the relationship between proactive coping and social support is possibly

reciprocal. This reciprocal association could explain both how the previous model and current model were acceptable. The current study focused on the variables that explain the impact of proactive coping with well-being, therefore, the causes of proactive coping were not examined.

Additionally, these results correspond with those of a study that included a measure of goal orientation, which assesses an individual's tendency to make plans to reach goals and is a similar measure to realistic goal setting, that also found a positive association between goal orientation and proactive coping (as assessed with the preventive coping subscale; Ouwehand, de Ridder, & Bensing, 2006). The results from the current study also may apply to this analysis, whereas, if the proactive coping subscale was included in addition to the preventive coping subscale, it may have revealed an even stronger relationship.

Although the proactive competencies, future appraisal, and use of feedback were significantly associated with Proactive Coping, as they were associated with the preventive coping scale in a previous study (Bode et al., 2007), they did maintain this relationship with Preventive Coping in the current analysis. Perhaps some aspects of Well-being are more reliant on these skills than others. For example, the bivariate correlations of future appraisal and positive affect, negative affect and satisfaction with life were all significant, whereas the relationship between future appraisal and physical symptoms was not. Additionally, the bivariate correlations of use of feedback with all of the outcomes included in Well-being were significantly associated in the predicted directions. It is likely that use of feedback shared so much variance with the other competencies that its unique effect was not strong enough to remain significant.

Situation Specific Coping Processes

Hypothesis 7, stating that the path between the proactive coping subscales and Well-being was mediated by the dimensions of academic self-regulation was partially confirmed. The results from this model support the notion that a small percentage of the effect of Proactive Coping on Well-being is partially mediated by selective help and self-efficacy, but the other measures of academic self-regulation (time management, task strategies, and self-monitoring) were not significantly contributing to explain this path.

Selective help was a measure of using social support, asking how many people are available to assist in situations such as when the participant is sick or needs to borrow notes. Thus, this result that another measure of social support helps to explain the path of Proactive Coping to Well-being is consistent with both how the measure of use of resources from the dispositional assessments of process was found to be a mediator, and with the previous study that found a relationship between proactive coping and social support (Greenglass et al., 2006).

Additionally, the result that self efficacy partially mediates the path from Proactive Coping to Well-being is supported by a previous studies were self-efficacy was also shown to be related to Proactive Coping (Diehl et al., 2006; Greenglass et al., 1999) and Preventive Coping (Greenglass et al., 1999; Ouwehand et al., 2006). Also, self-efficacy is the corresponding component in the theories of self-regulation to realistic goal setting, which was a significant mediator in the dispositional model. Again, the association between Preventive Coping and self-efficacy most likely did not remain significant because of the great amount of variance shared with Proactive Coping. The low internal consistencies of the items in time management, task strategies, and self-monitoring may explain why these variables did not appear to mediate this path. Finally, the results from this hypothesis did not remain significant in the final model explaining the path from proactive coping to well-being. This could be due to these low internal consistencies, as well.

Proactive Coping as a Process

Hypothesis 8, which integrated the theories from the previous hypotheses to examine how the association between Proactive Coping and Preventive Coping with Well-being is explained, included dispositional proactive competencies, academic measures of self regulation, and initial appraisals simultaneously. This analysis revealed that use of resources, selective help, initial appraisals of importance, realistic goal setting and perhaps self-efficacy, explained a combined 36.5% of the association between Proactive Coping and Well-being. The hypothesized model proposed that Proactive Coping would lead to the dispositional proactive competencies, which would lead to the corresponding situational hypotheses and then to Well-being. However, the results from this model revealed that it did not mediate any of the variance from Proactive Coping to

Well-being. It seems that the dispositional quality of social support and the more situational assessment of social support are significantly related, as are the dispositional and situational measure of preliminary coping efforts (as shown by the model and supported by significant bivariate correlations), however, it is not through these relationships that Proactive Coping was explained. Therefore, the model including each of these components with separate paths was superior.

The addition of initial appraisals to this complete model further supports the five steps in proactive coping as proposed by Aspinwall and Taylor (1997) whereby initial appraisal is proposed to be the second step. Previous studies of proactive coping have not yet included this measure, therefore, this is the first study to extend the coping literature suggesting that viewing a stressor as important or relevant is an aspect of the proactive coping process, as well (Chang, 1998). The results of the current study showing that proactive coping was significantly related to initial appraisal, which was, in turn, negatively related to well-being, is in concordance with a previous study that found that initial appraisals were significantly related to optimism, negatively related to satisfaction with life, and positively related to physical symptoms (Chang, 1998). This previous study used the same measures as the current study, except that (1) the initial appraisals were divided into four separate items in the current study and totaled as a scale in the previous study, and (2) the measures of satisfaction with life and physical symptoms were combined in the current study and analyzed separately in the previous study. Additionally, to clarify this comparison, the previous study interpreted the results where the appraisals occurred prior to coping strategies, whereas the current study did not address the temporal sequence of the self-regulation strategies. In both studies, optimism and proactive coping were considered dispositional predictors of coping processes, however, these dispositions were considered to be possibly part of the process, as well (Chang, 1998). Finally, recall that the measure of self-efficacy in the current study was the same as the assessment of secondary appraisals in the previous study. Consistent with an important step in the validation of a new measure of coping, proactive coping was found to be significantly associated with well-being even after taking primary and secondary appraisals into account. Again, these results changed with the addition of optimism in the final model, resulting in nonsignificant paths from selective help to Well-

being, important appraisal to Well-being, Proactive Coping to Well-being, and self-efficacy to Well-being. Therefore the interpretation of the final hypothesis is the most important to consider.

Final Model

Lastly, Hypothesis 9 predicted that both Proactive Coping and Preventive Coping would remain significant predictors of Well-being when optimism was included in the analyses. The results indicated that the variance from Proactive Coping that was not shared with optimism appeared to be fully explained by use of resources, realistic goal setting, and possibly selective help, whereas the path from Preventive Coping to Well-being was no longer significantly negatively associated with Well-being nor explained by the included process variables. This result that Proactive Coping remained predictive of salutary outcomes when accounting for its shared variance with optimism is consistent with a previous study that also found that in a hierarchical regression that the proactive coping subscale was significantly uniquely predictive of depression and marginally significantly influential for life satisfaction over and above the contribution of optimism (Uskul & Greenglass, 2005).

Overall, the outcome that the positively-framed Proactive Coping was significantly associated with Well-being over and above the negatively-framed Preventive Coping is consistent with how the negativity bias and positivity offset are found to operate (Ito & Cacioppo, 2005). Negativity bias, or a tendency to focus more on negative information, occurs more when there is a higher level of stimulation, while positivity offset tends to be a more general view of situations as positive unless there is an imminent challenge. Individuals vary on their tendencies to use the negativity bias or positivity offset, which operate independently and may explain why some people are more likely to proactively cope than others. Those who have a tendency towards positivity offset may be more likely to view upcoming events positively, as goals to be met, while others with a tendency towards negativity bias could have more of a tendency to view these upcoming events negatively, as threats.

Limitations

The lack of association of either measure of proactive coping with environmental structuring and the low relationships between proactive coping and the measures of

academic self-regulation overall are most likely due to the relatively weak assessment of these constructs. Since this was the first study of academic self-regulation in relation to proactive coping, these analyses were largely exploratory. Thus, standardized measures of these mediating variables could possibly lead to more robust relationships among these constructs or at least allow one to more firmly conclude if a relationship exists.

Similarly, controlling for GPA as in previous studies (Bolger, 1990; Kirby et al., 2002) or SAT score may have partialled out a degree of the possible noise in exam score that was due to intelligence and not unique to achievement in the specific situation. However, in the current assessment of GPA, it was not clear if the students (many of whom were in their first year of college) were reporting their high school GPA or their university GPA, and for the SAT score, it was not possible to distinguish which students took the SAT before it was changed in 2005. Therefore these were not controlled for in the current study and future research could consider these qualifications when assessing these variables.

In addition, most of the included measures were self-report, with the exception of exam score. This shared assessment method may have contributed to the shared variance among the variables and these variables could be assessed with other methods in future research. Additionally, these results from a sample of undergraduate participants may not apply to general population due to the restricted age range and socioeconomic status inherent to this sample. Finally, the cross-sectional nature of the study was not ideal for testing mediation hypotheses. Therefore, the proposed associations among the variables in this study are a plausible explanation for how these constructs are connected, however, longitudinal research would need to be conducted to clearly establish the causal direction of these relationships.

Future Directions

The current study clarifies that the proactive coping subscale of the PCI appears to be assessing Schwarzer and Taubert's (2002) definition of proactive coping, which is supported as the new standard definition of this construct. In future research, it is recommended that, when referring to the proactive coping subscale of the PCI, to use the term *proactive coping,* and when referring to the preventive coping subscale to use the term *preventive coping*, and to use both subscales of the Proactive Coping Inventory to

refer to the measure as the *Future-Oriented Coping Inventory,* as proposed by Gan et al. (2008). Measuring emotions related to initial appraisals may further clarify the distinction between proactive coping and preventive coping. Also, since there was some suggestion of the unique predictive ability of Preventive Coping through mediators such as self-monitoring or outcomes that are performance related, it would be beneficial to continue to explore this construct together with Proactive Coping as *future-oriented coping*.

Furthermore, since it is likely that proactive coping varies across situations, as demonstrated by one study (Ouwehand et al., 2006), future research is needed to determine if these results are consistent across different contexts and in different samples. Also, developing a stronger measure of academic self-regulation specific to this situation would strengthen the conclusions about proactive coping and self-regulation in this context.

Additionally, as demonstrated by the final model, use of resources and selective goal setting appear to be fairly robust mediators partially explaining the impact Proactive Coping has on Well-being. This partially supports the theory of the stages of proactive coping, as proposed by Aspinwall and Taylor (1997), suggesting that this framework could be explored further to fully understand this process. Also, since the indirect path through use of resources (.05) was not as strong as that with realistic goal setting (.24), perhaps assessing additional resources, such as time or finances (Aspinwall & Taylor, 1997), could strengthen this relationship.

Finally, these results imply that interventions aiming to strengthen the benefits of proactive coping should focus primarily on promoting social support resources and realistic goal setting. Altering these competencies is more feasible than directly changing proactive coping, yet may eventually lead to this result. Effective interventions are already being developed and implemented to promote the proactive competencies in the area of preparation for aging (Bode et al., 2006; Bode et al., 2007) and similarly to promote proactive personality in the area of academic and achievement (Kirby et al., 2002). There are many other contexts to be explored, such as physical health or relationship success, that may benefit from interventions of this kind.

Conclusion

In conclusion, the current study supports the definition of proactive coping developed by Schwarzer and Taubert (2002) that focuses on a positively focused striving for goals and personal growth more so than a negatively focused prevention of possible averse outcomes. This construct is successfully measured by the proactive coping subscale of the Proactive Coping Inventory (Greenglass et al., 1999). It may be beneficial to include the preventive coping subscale when assessing other upcoming stressors to further determine the unique predictive ability of each subscale in regards to different outcomes.

Additionally, the framework explaining the process of why proactive coping leads to beneficial outcomes is best explained by the self-regulatory mechanisms proposed by Aspinwall and Taylor (1997) and measured by the Proactive Competence Scale (Bode et al., 2007). Finally, the current study supported that the competencies of resource accumulation, particularly in the area of social support, and preliminary coping, in the form of realistic goal setting, are particularly successful in explaining the impact that proactive coping has on well-being. These associations remained strong even after accounting for the highly related construct, optimism. Therefore, interventions implemented to promote proactive coping could shift their focus primarily to these mechanisms and might increase their effectiveness and future research should explore how to apply these interventions to additional contexts.

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Table 1

Corresponding components from the theories of self-regulation

Proactive Coping Theory	Proactive Competencies	Academic Self -Regulation
Resource accumulation	Use of resources	Time management, Selective help seeking
Recognition of potential stressors Initial appraisal	Future appraisal	Environmental structuring
Preliminary coping efforts	Realistic goal setting	Goal setting and self-efficacy, Task strategies
Elicitation and use of feedback	Use of feedback	Self monitoring

Table 2

Correlations, means and standard deviations of all study variables

	1	2	3	4	5
1. Proactive Coping	--	0.60***	0.08	0.01	0.31***
2. Preventive Coping		--	-0.01	0.01	0.22***
3. Age			--	-0.16**	0.06
4. Challenging				--	0.36***
5. Important					--
6. Stressful					
7. Threatening					
8. Use of Resources					
9. Future Appraisal					
10. Realistic Goal Setting					
11. Use of Feedback					
12. Time Management					
13. Selective Help					
14. Environmental Structuring					
15. Self-efficacy					
16. Task Strategies					
17. Self-monitoring					
18. Exam Score					
19. Positive Affect					
20. Negative Affect					
21. Satisfaction With Life					
22. Physical Symptoms					
23. Optimism					
M	42.45	26.63	19.22	5.27	6.13
SD	6.13	4.33	2.58	1.34	1.10

*p < 0.05, **p < 0.01, ***p < 0.001

Table 2 (cont.)

	6	7	8	9	10
1. Proactive Coping	-0.07	0.00	0.46***	0.53***	0.73***
2. Preventive Coping	0.04	0.00	0.34***	0.41***	0.50***
3. Age	-0.15*	-0.19**	0.02	0.03	0.04
4. Challenging	0.65***	0.66***	0.02	-0.02	-0.04
5. Important	0.49***	0.35***	0.18**	0.11	0.25***
6. Stressful	--	0.70***	-0.03	-0.10	-0.12*
7. Threatening		--	-0.04	-0.07	-0.06
8. Use of Resources			--	0.57***	0.62***
9. Future Appraisal				--	0.67***
10. Realistic Goal Setting					--
11. Use of Feedback					
12. Time Management					
13. Selective Help					
14. Environmental Structuring					
15. Self-efficacy					
16. Task Strategies					
17. Self-monitoring					
18. Exam Score					
19. Positive Affect					
20. Negative Affect					
21. Satisfaction With Life					
22. Physical Symptoms					
23. Optimism					
M	5.07	4.73	12.24	9.24	25.76
SD	1.64	1.73	2.75	1.68	4.13

*p < 0.05, **p < 0.01, ***p < 0.001

Table 2 (cont.)

	11	12	13	14	15
1. Proactive Coping	0.68***	0.33***	0.12	-0.05	0.24**
2. Preventive Coping	0.46***	0.32***	0.07	0.02	0.16*
3. Age	-0.03	-0.02	0.01	0.03	0.20**
4. Challenging	0.05	-0.02	0.03	-0.05	-0.27***
5. Important	0.28***	0.17**	0.08	0.00	0.11
6. Stressful	-0.02	-0.03	0.09	-0.01	-0.24***
7. Threatening	0.00	-0.10	0.03	-0.05	-0.28***
8. Use of Resources	0.59***	0.30***	0.16**	-0.08	0.11
9. Future Appraisal	0.65***	0.29***	0.07	-0.10	0.17**
10. Realistic Goal Setting	0.80***	0.35***	0.12*	-0.05	0.27***
11. Use of Feedback	--	0.33***	0.14*	-0.03	0.18**
12. Time Management		--	0.19**	0.04	0.28***
13. Selective Help			--	-0.07	0.04
14. Environmental Structuring				--	0.07
15. Self-efficacy					--
16. Task Strategies					
17. Self-monitoring					
18. Exam Score					
19. Positive Affect					
20. Negative Affect					
21. Satisfaction With Life					
22. Physical Symptoms					
23. Optimism					
M	18.87	5.16	3.10	2.38	9.63
SD	3.51	1.10	0.89	0.54	2.51

*p < 0.05, **p < 0.01, ***p < 0.001

Table 2 (cont.)

	16	17	18	19	20
1. Proactive Coping	0.18**	0.12	0.06	0.56***	-0.26***
2. Preventive Coping	0.10	0.16*	0.12*	0.34***	-0.05
3. Age	0.00	0.02	-0.11	0.04	-0.05
4. Challenging	-0.06	-0.02	-0.19**	-0.04	0.09
5. Important	0.14*	0.24***	0.07	0.16**	0.02
6. Stressful	-0.02	0.10	-0.14*	-0.12*	0.19**
7. Threatening	-0.06	-0.01	-0.22	-0.08	0.22***
8. Use of Resources	0.04	0.08	0.00	0.47***	-0.19**
9. Future Appraisal	0.16**	0.10	0.01	0.42***	-0.18**
10. Realistic Goal Setting	0.20**	0.14*	0.07	0.58***	-0.25***
11. Use of Feedback	0.16**	0.14*	0.06	0.53***	-0.26***
12. Time Management	0.22***	0.20**	0.27***	0.25***	-0.06
13. Selective Help	0.03	0.11	-0.04	0.21**	-0.10
14. Environmental Structuring	0.05	-0.04	0.16**	-0.05	0.05
15. Self-efficacy	0.26***	0.17**	0.28***	0.25***	-0.09
16. Task Strategies	--	0.22***	0.10	0.10	-0.15*
17. Self-monitoring		--	0.07	0.11	-0.02
18. Exam Score			--	-0.03	-0.03
19. Positive Affect				--	-0.14*
20. Negative Affect					--
21. Satisfaction With Life					
22. Physical Symptoms					
23. Optimism					
M	5.54	2.23	34.86	30.10	23.63
SD	1.40	0.96	6.28	8.67	8.02

*p < 0.05, **p < 0.01, ***p < 0.001

Table 2 (cont.)

	21	22	23
1. Proactive Coping	0.44***	-0.18**	0.61***
2. Preventive Coping	0.25***	-0.04	0.23***
3. Age	0.00	-0.08	0.05
4. Challenging	-0.07	0.04	-0.07
5. Important	0.10	0.01	0.12*
6. Stressful	-0.11	0.11	-0.20**
7. Threatening	-0.10	0.13*	-0.15*
8. Use of Resources	0.37***	-0.10	0.36***
9. Future Appraisal	0.33***	-0.08	0.33***
10. Realistic Goal Setting	0.51***	-0.17**	0.54***
11. Use of Feedback	0.43***	-0.23***	0.48***
12. Time Management	0.27***	-0.07	0.29***
13. Selective Help	0.20**	-0.02	0.20**
14. Environmental Structuring	0.00	0.08	-0.04
15. Self-efficacy	0.25***	-0.10	0.24***
16. Task Strategies	0.10	-0.17**	0.08
17. Self-monitoring	0.09	-0.03	0.07
18. Exam Score	0.09	0.03	0.09
19. Positive Affect	0.49***	-0.22***	0.49***
20. Negative Affect	-0.37***	0.49***	-0.47***
21. Satisfaction With Life	--	-0.28***	0.52***
22. Physical Symptoms		--	-0.32***
23. Optimism			--
M	21.77	110.87	17.47
SD	7.18	28.81	4.82

*p < 0.05, **p < 0.01, ***p < 0.001

Table 3

Correlations, means and standard deviations of variables in Hypothesis 2

	1	2	3	4	5	6
1. Proactive Coping	--	0.60***	0.01	0.31***	-0.07	0.00
2. Preventive Coping		--	0.01	0.22***	0.04	0.00
3. Challenging			--	0.36***	0.65***	0.66***
4. Important				--	0.49***	0.35***
5. Stressful					--	0.70***
6. Threatening						--
M	42.45	26.63	5.27	6.13	5.07	4.73
SD	6.13	4.33	1.34	1.10	1.64	1.73

*p < 0.05, **p < 0.01, ***p < 0.001
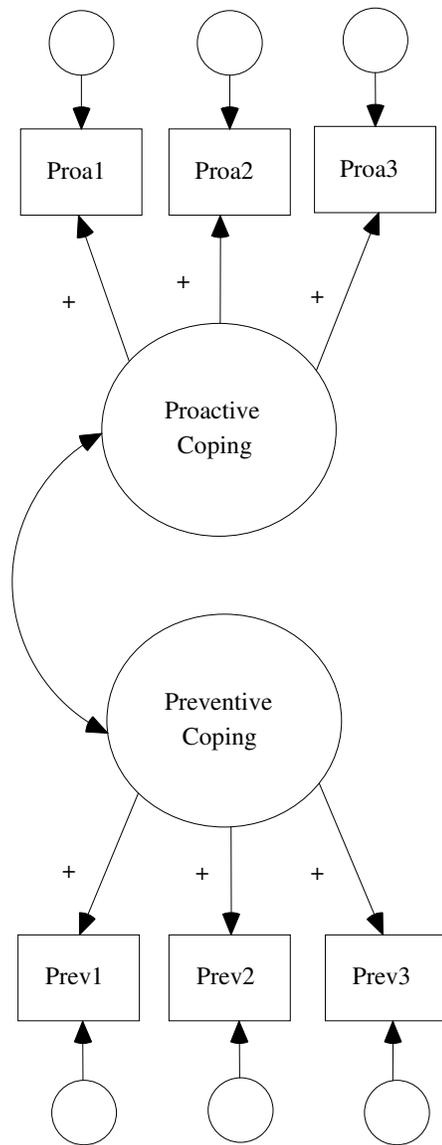
Figure 1. Proposed model of Hypothesis 1 displaying a related two-factor structure of the proactive coping subscale and the preventive coping subscale from the Proactive Coping Inventory.
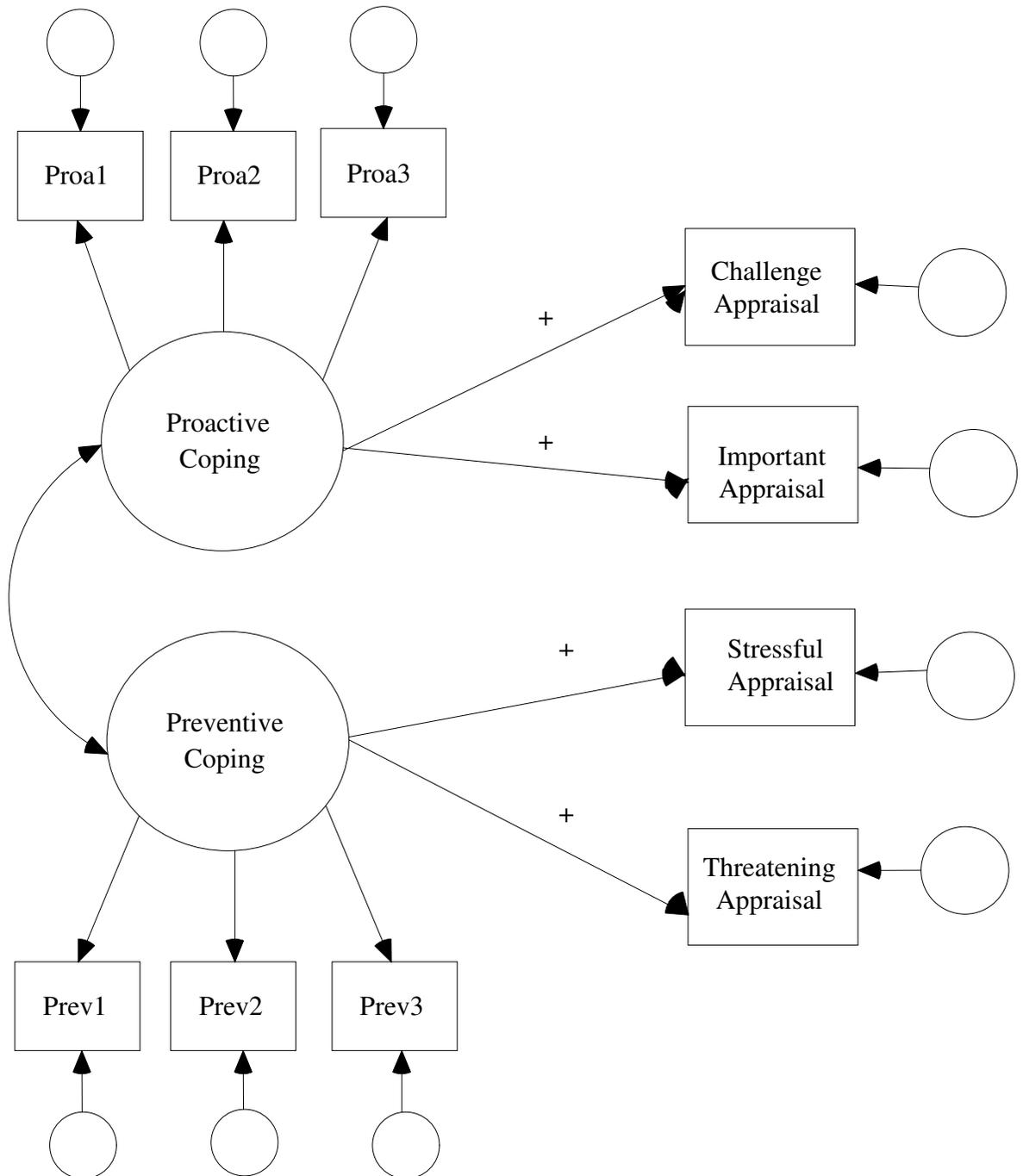
Figure 2. Proposed model for Hypothesis 2 with Proactive Coping and Preventive Coping differentially predicting initial appraisals.
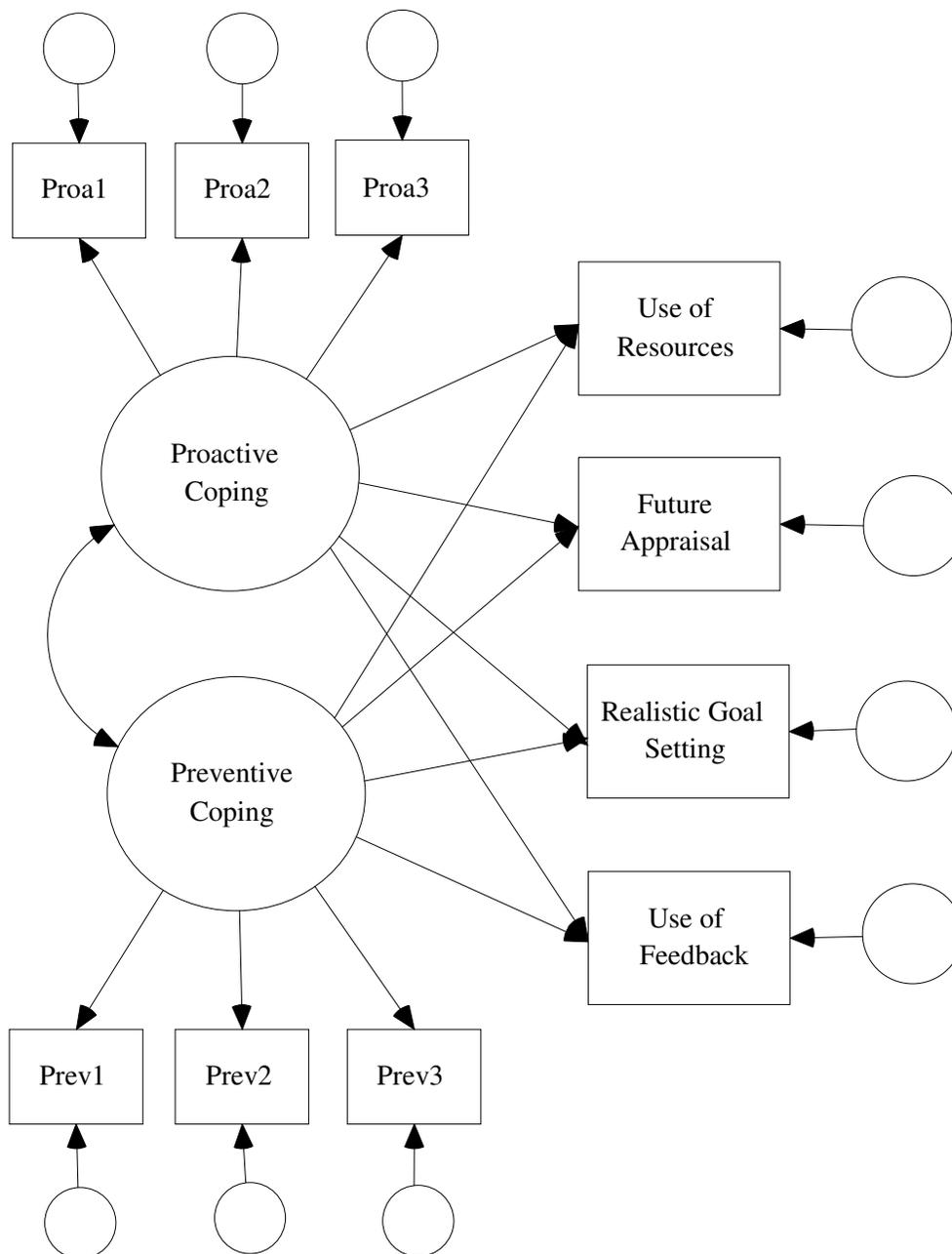
Figure 3. Proposed model of Hypothesis 3. All paths from Proactive Coping and Preventive Coping to the proactive competencies were predicted to be in the positive direction.
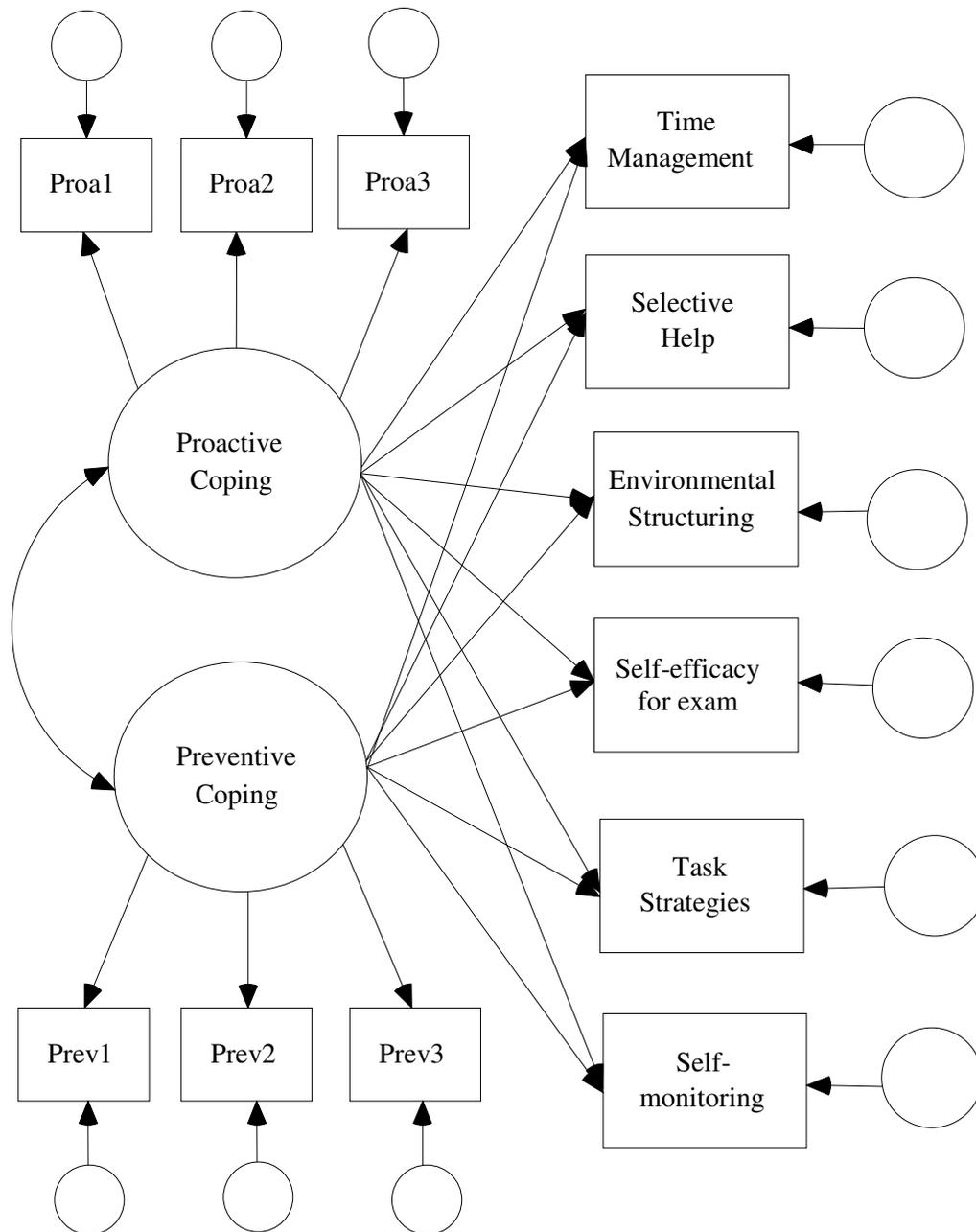
Figure 4. Proposed model of Hypothesis 4. All paths from Proactive Coping and Preventive Coping to the measures of academic self-regulation were predicted to be in the positive direction.
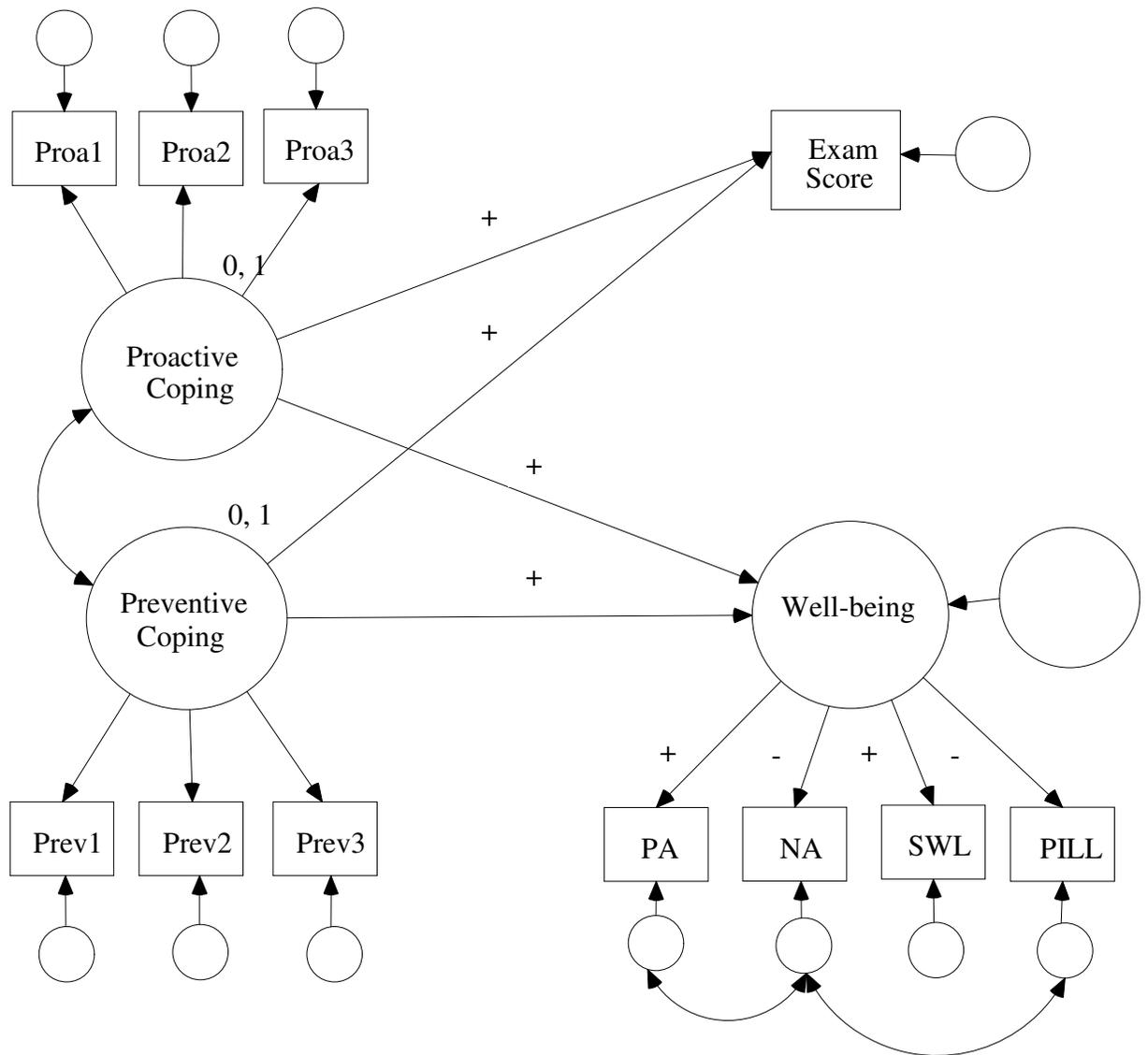
Figure 5. Proposed model of Hypothesis 5 showing Proactive Coping and Preventive
Coping both predicting exam score and Well-being.
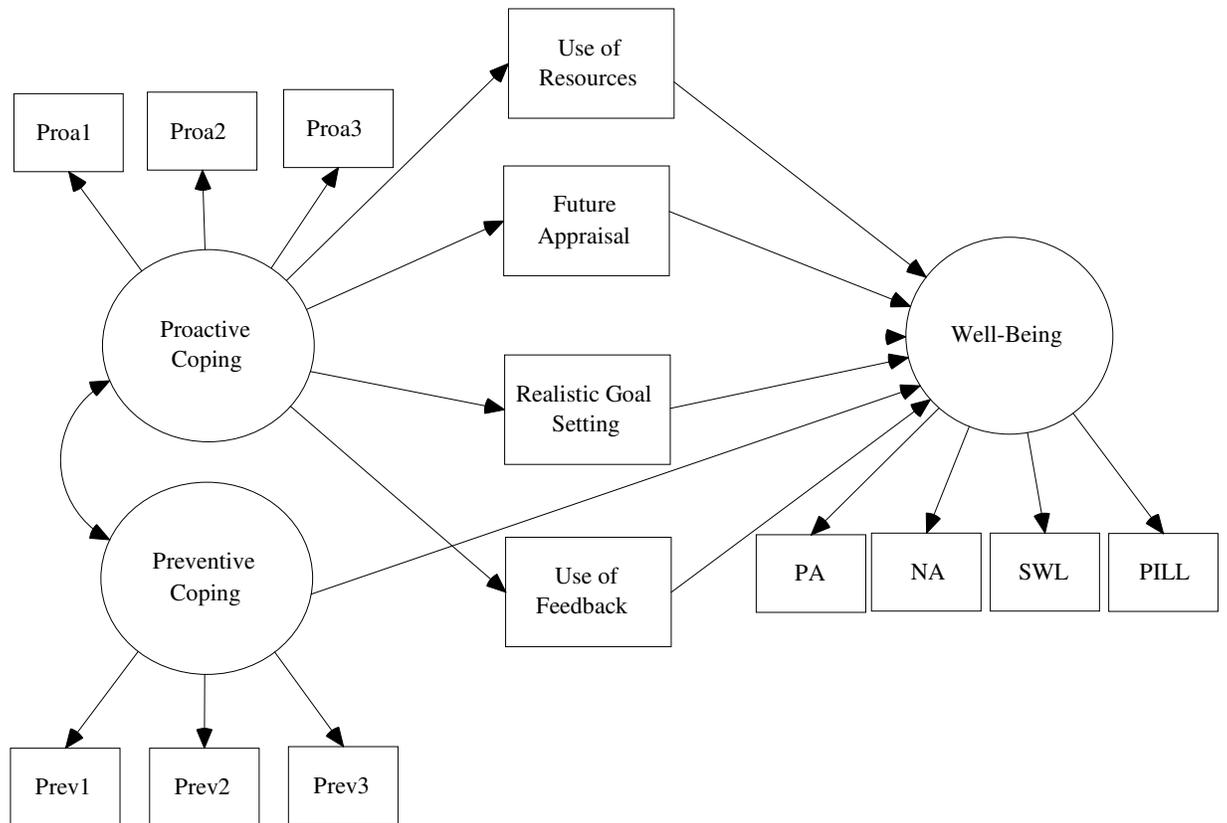
Figure 6. Proposed model for Hypothesis 6 illustrating that the paths from Proactive Coping and Preventive Coping to Well-being were expected to be mediated by the proactive competencies. The model was adapted based on results from Hypothesis 3. For simplicity, error terms are not shown.
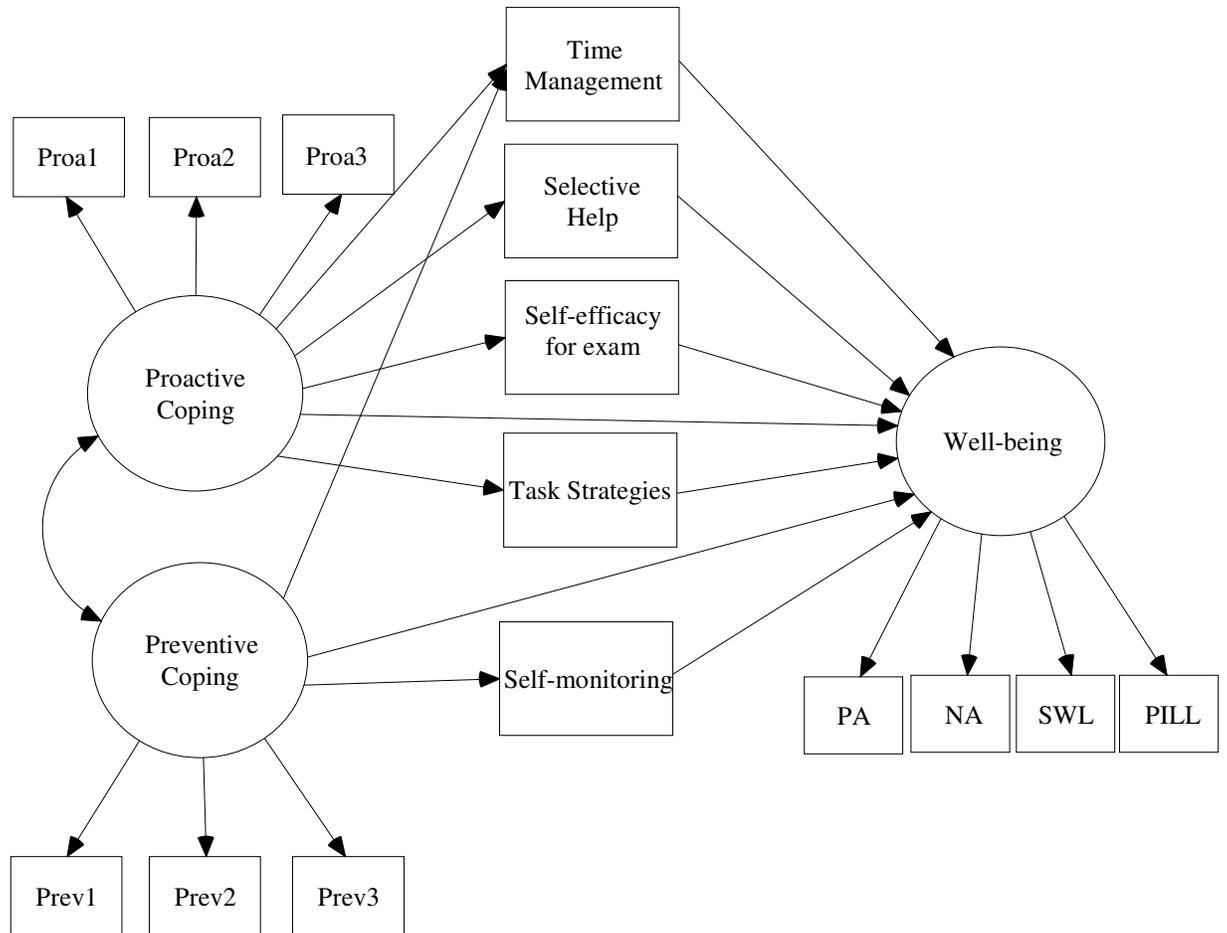
Figure 7. Proposed model for Hypothesis 7 illustrating that the paths from Proactive Coping and Preventive Coping to Well-being were predicted to be partially mediated by the measures of academic self-regulation. The model was adapted based on results from Hypothesis 4. For simplicity, error terms are not shown.
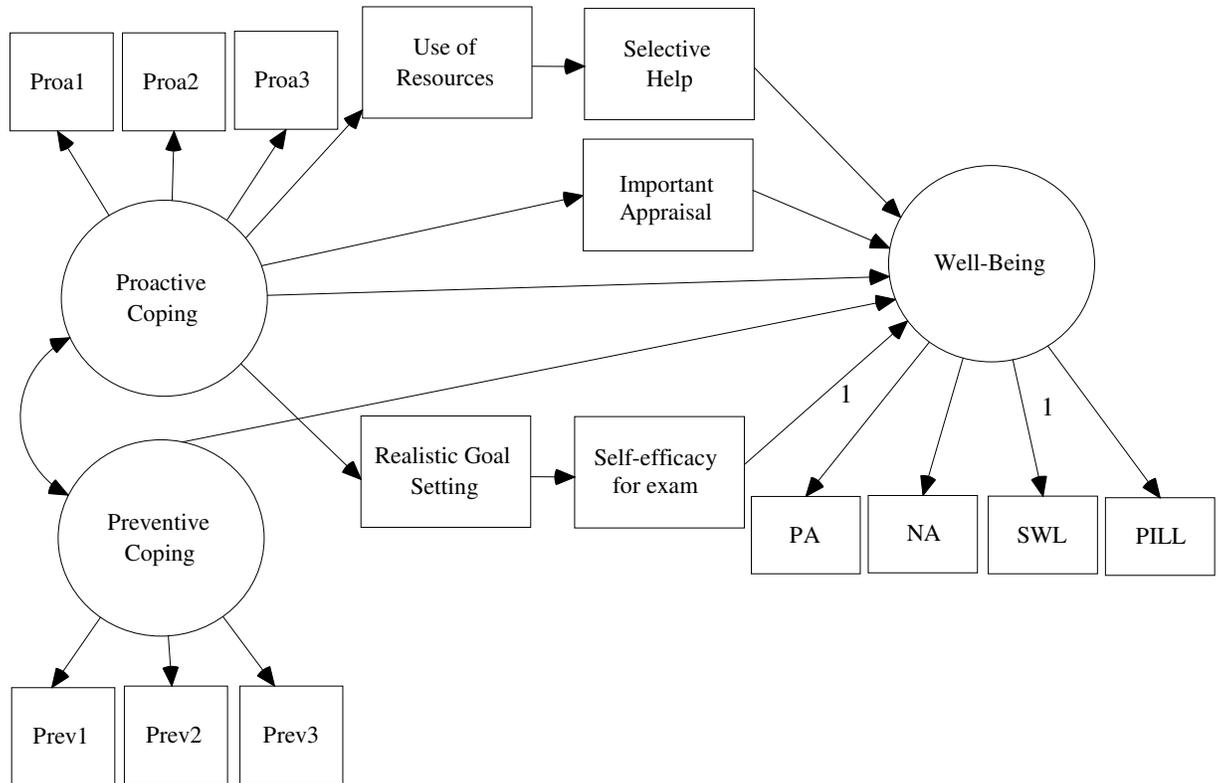
Figure 8. Proposed model for Hypothesis 8 predicting that the dispositional proactive competencies will lead to the situation specific academic measures of self regulation, incorporating initial appraisals to create a complete model. This model was adapted based on the results of previous models. For simplicity, error terms are not shown.
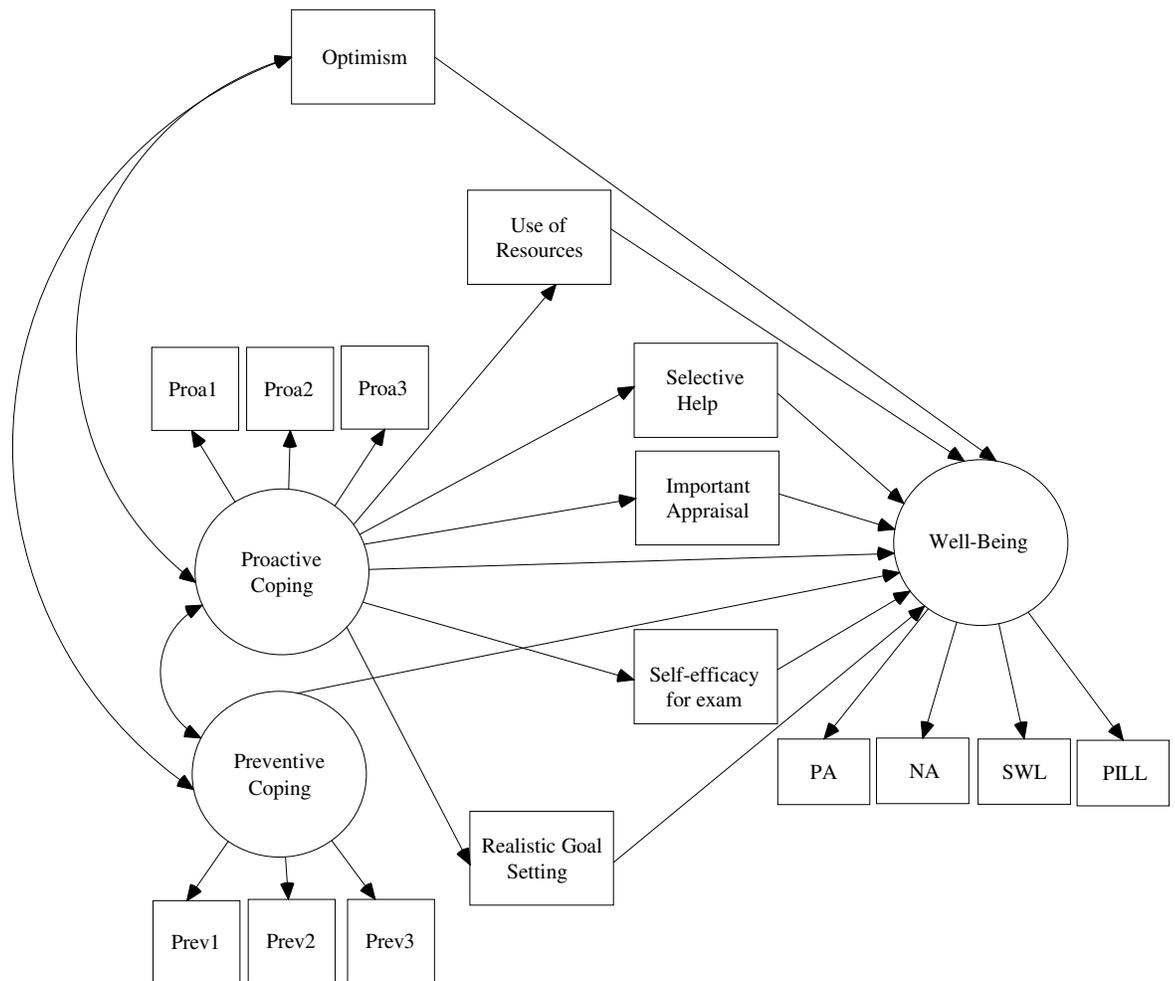
Figure 9. Proposed model for Hypothesis 9 that added a measure of optimism to the complete model to determine the unique predictive ability of proactive coping. For simplicity, error terms are not shown.
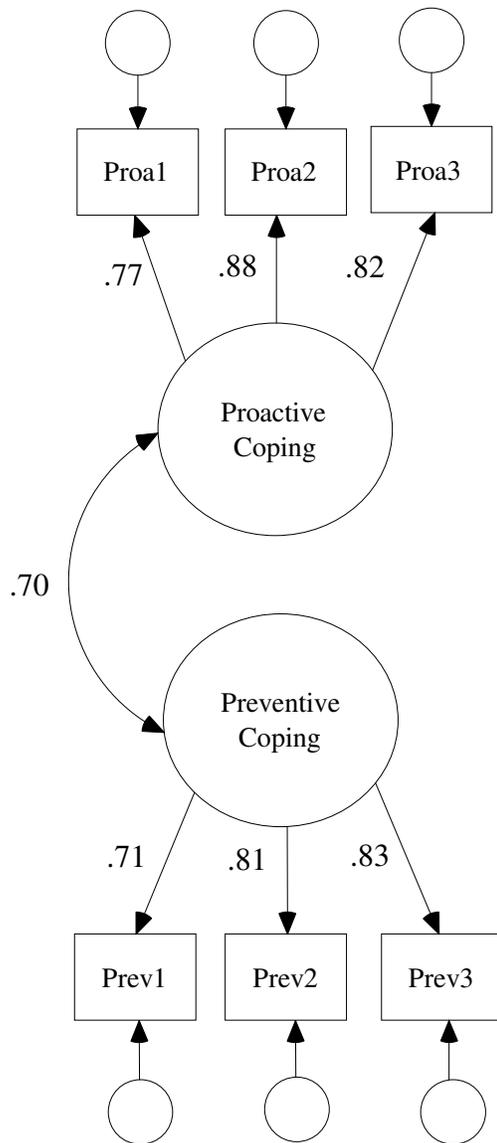
Figure 10. Final model of Hypothesis 1 illustrating the factor structure of the Future-oriented Coping Inventory, $\chi^2(8, N = 281) = 5.94$, $p = 0.65$; RMSEA = 0.00, $p = .92$; CFI = 1.00. All path coefficients displayed are statistically significant ($p < .01$).
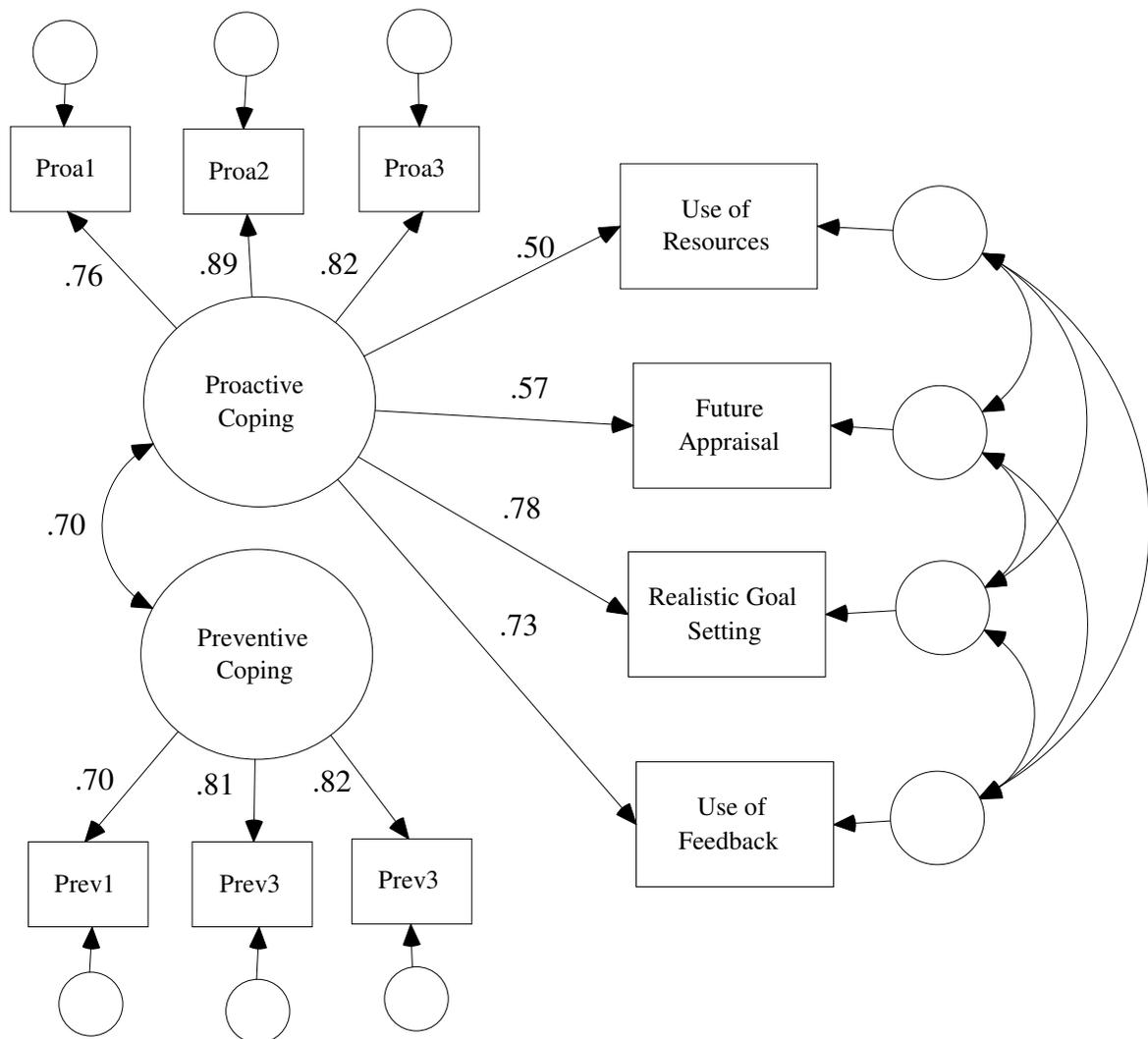
Figure 11. Final model of Hypothesis 3 illustrating how Proactive Coping and Preventive Coping are related to the proactive competencies, χ^2 (28, $N = 281$) = 41.06, $p = .05$; RMSEA = .04, $p = .70$; CFI = .99. All paths are statistically significant $p < .01$.
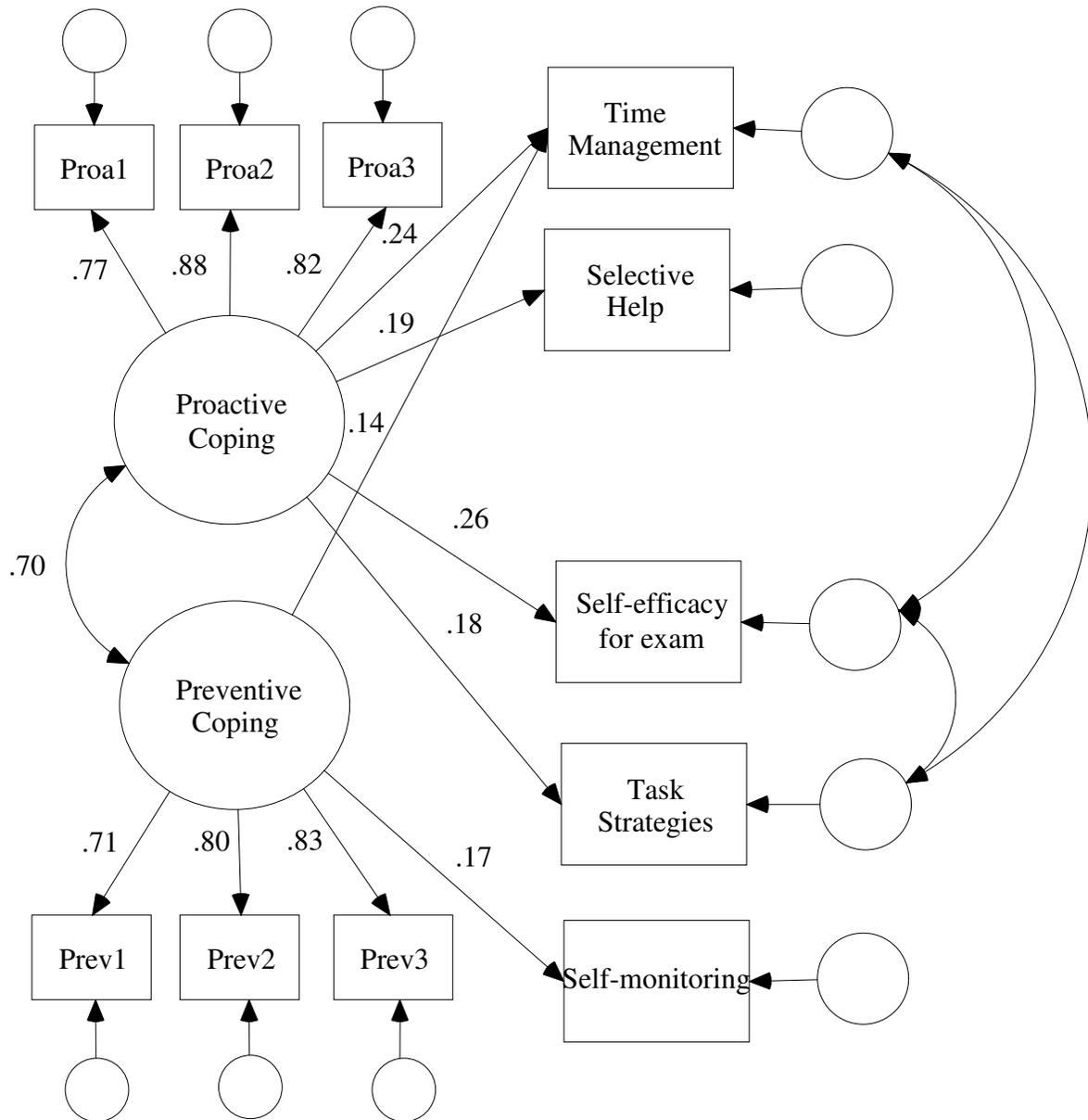
Figure 12. Final model of Hypothesis 4 showing how Proactive Coping and Preventive Coping are related to the measures of academic self-regulation, $\chi^2(39, N = 281) = 49.76$, $p = .12$; RMSEA = .03, $p = .89$; CFI = .99. All new paths are significant $p < .01$ with the exception of Proactive Coping to selective help and Preventive Coping to time management $p < .05$.
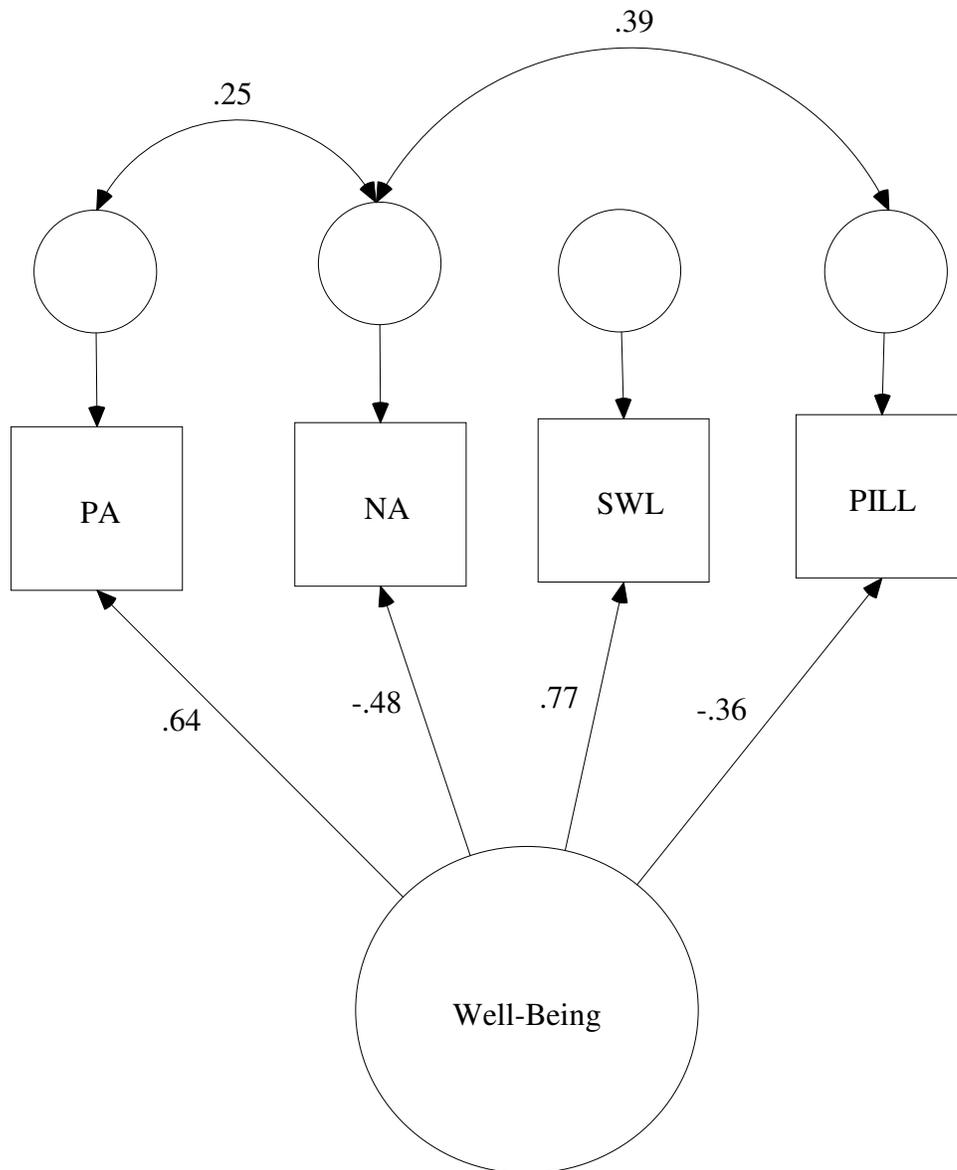
Figure 13. Measurement model for Hypothesis 5, $\chi^2(1, N = 281) = 0.06$, $p =.81$; CFI = 1.0; RMSEA =0.00 , $p = 0.86$. All paths are significant at $p < .01$.
Note. PA = Positive Affect; NA = Negative Affect, SWL = Satisfaction With Life; PILL = Physical Symptoms.
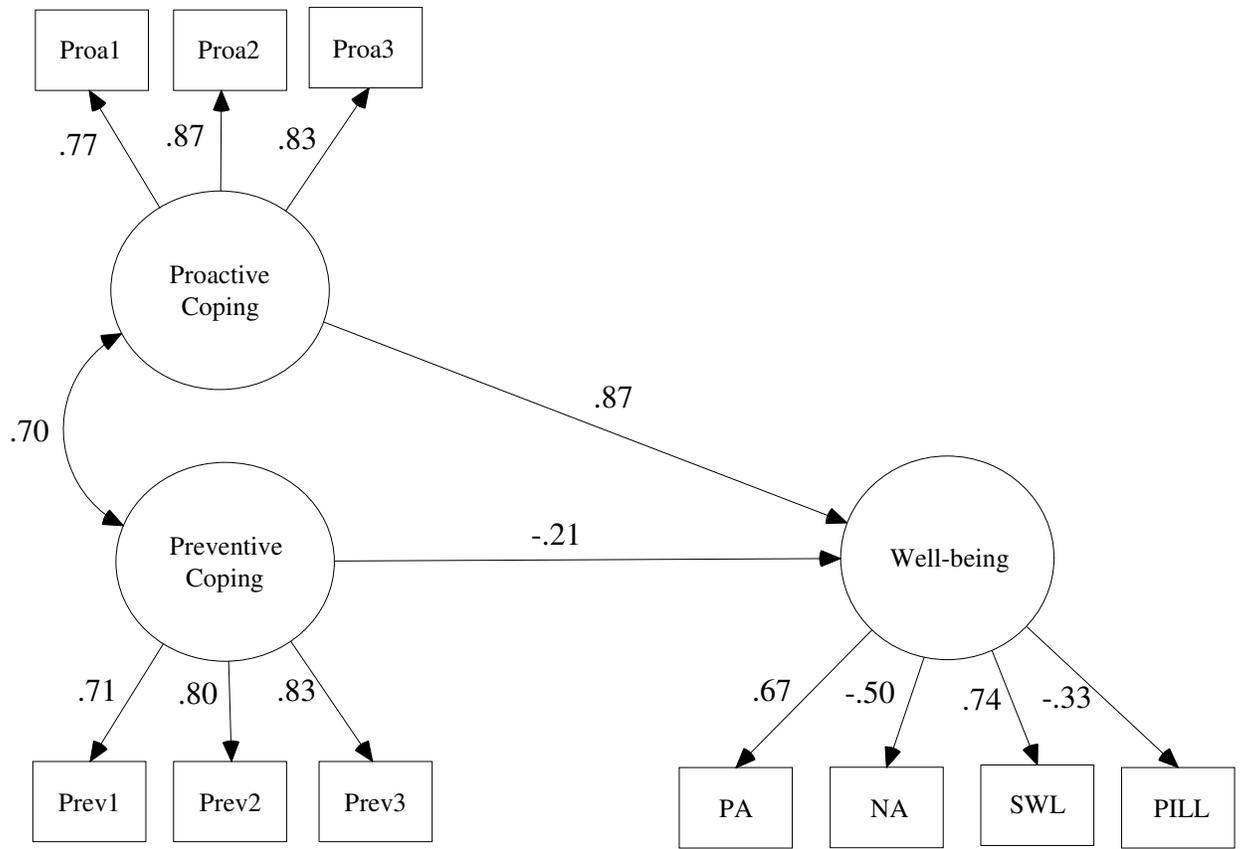
Figure 14. Final model for Hypothesis 5 examining the impact of Proactive Coping and Preventive Coping on Well-being, χ^2 (31, N = 281) = 47.54, p = .03; RMSEA = 0.04, p = .64; CFI = .99. All paths are significant at p < .01 with the exception of Preventive Coping to Well-being, p < .05. For simplicity, error terms and values are not shown. *Note*. PA = Positive Affect; NA = Negative Affect, SWL = Satisfaction With Life; PILL = Physical Symptoms.
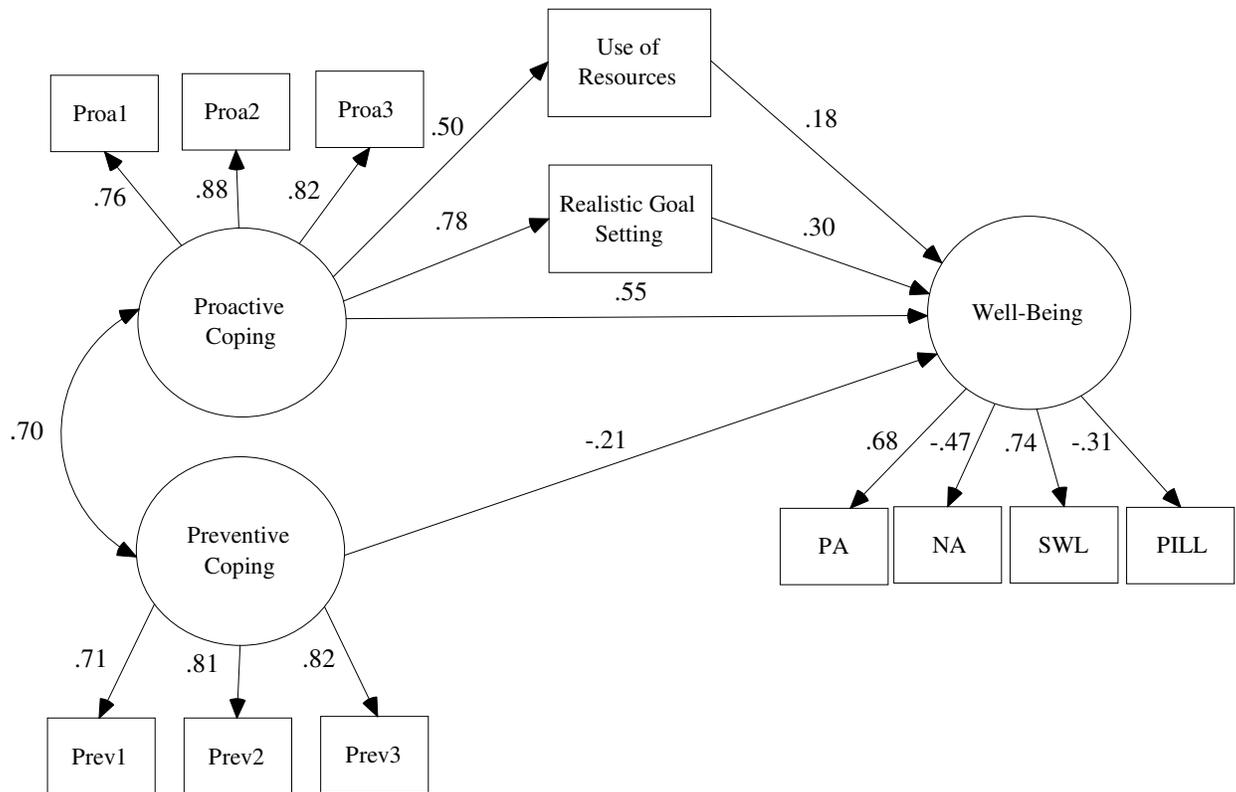
Figure 15. Final model for Hypothesis 6 examining how the impact of Proactive Coping and Preventive Coping on Well-being is explained by the proactive competencies, χ^2 (47, $N = 281$) = 65.86, $p = .04$; RMSEA = .04, $p = .82$; CFI = .99. All parameters were significant at the p < .01 level with the exception of Preventive Coping to Well-being ($p < .05$). For simplicity, error terms and values are not shown.
Note. PA = Positive Affect; NA = Negative Affect, SWL = Satisfaction With Life; PILL = Physical Symptoms.
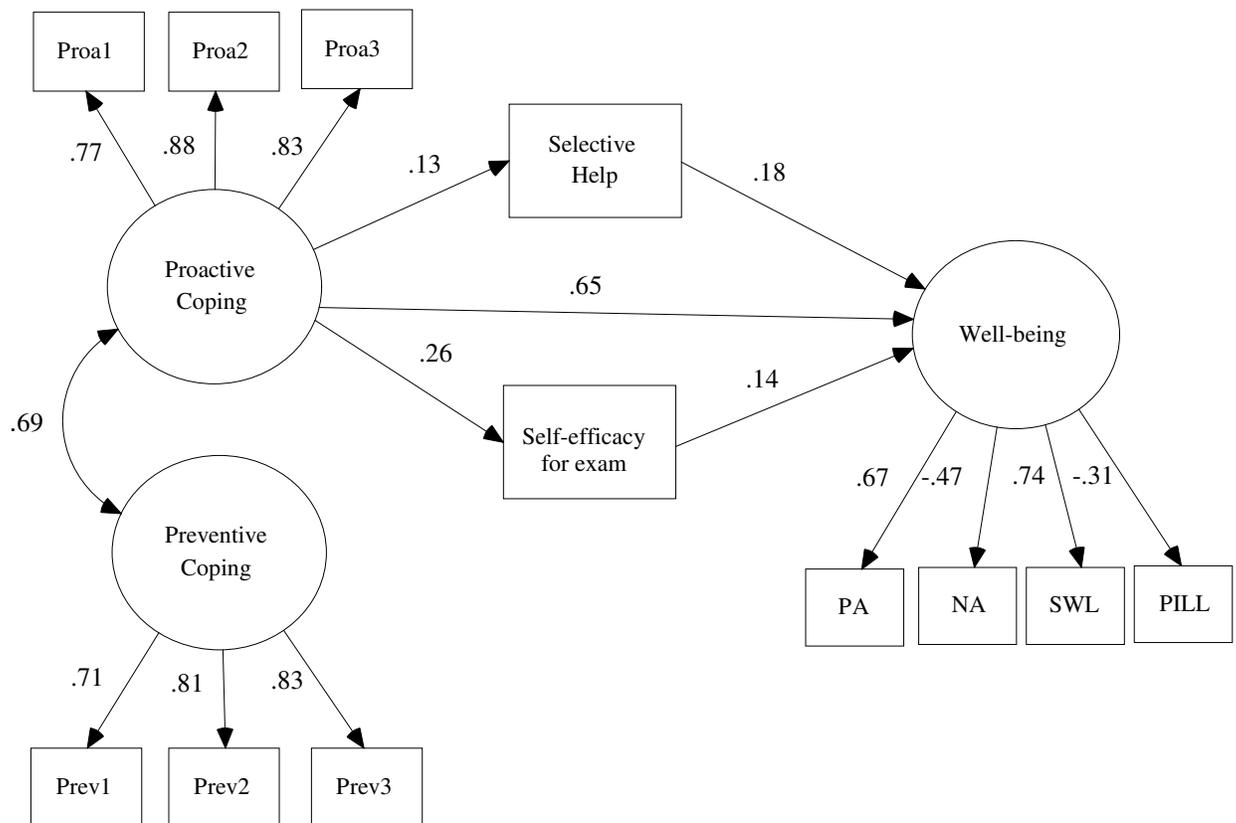
Figure 16. Final model for Hypothesis 7 examining how the impact of Proactive Coping and Preventive Coping on Well-being is explained by the measures of academic self-regulation, χ^2 (49, N = 281) = 67.20, p = .04; RMSEA = .04, p = .86; CFI = .99. All paths in the model were significant at the level of p < .01 with the exceptions of Proactive Coping to selective help and self-efficacy to Well-being (p < .05). For simplicity, error terms and values are not shown.
Note. PA = Positive Affect; NA = Negative Affect, SWL = Satisfaction With Life; PILL = Physical Symptoms.
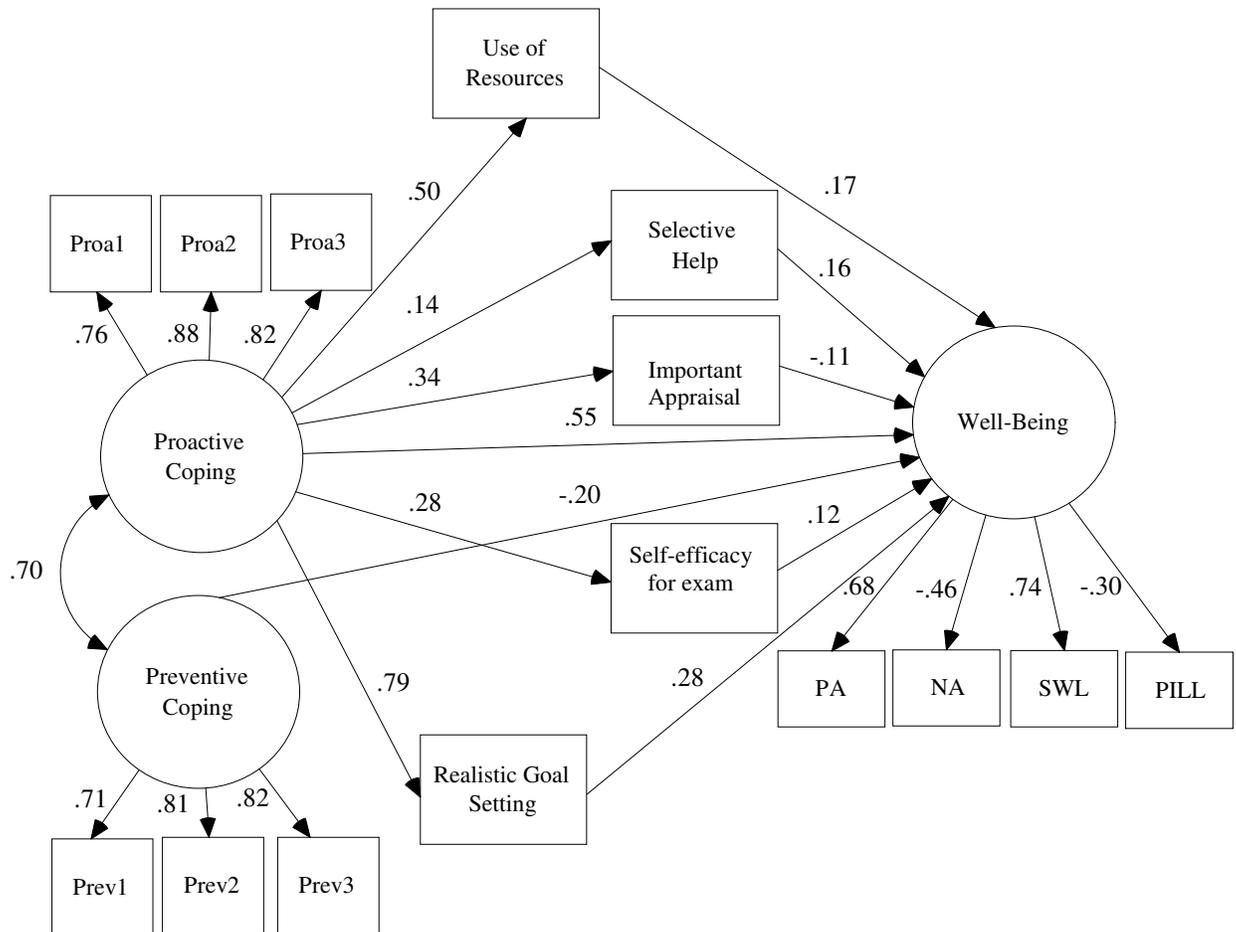
Figure 17. A final model for Hypothesis 8 integrating the previous models to examine how the association between Proactive Coping and Preventive Coping with Well-being is explained by the dispositional proactive competencies, academic measures of self regulation, and initial appraisals, $\chi^2(80, N = 281) = 94.78, p = .12$; RMSEA = .03, $p = .99$; CFI = .99. All paths were significant at a $p < .01$ level with the exceptions of Proactive Coping to selective help, self-efficacy to Well-being, important to well-being, and Preventive Coping to Well-being ($p < .05$). For simplicity, error terms and values are not shown.
*Note*. PA = Positive Affect; NA = Negative Affect, SWL = Satisfaction With Life; PILL = Physical Symptoms.
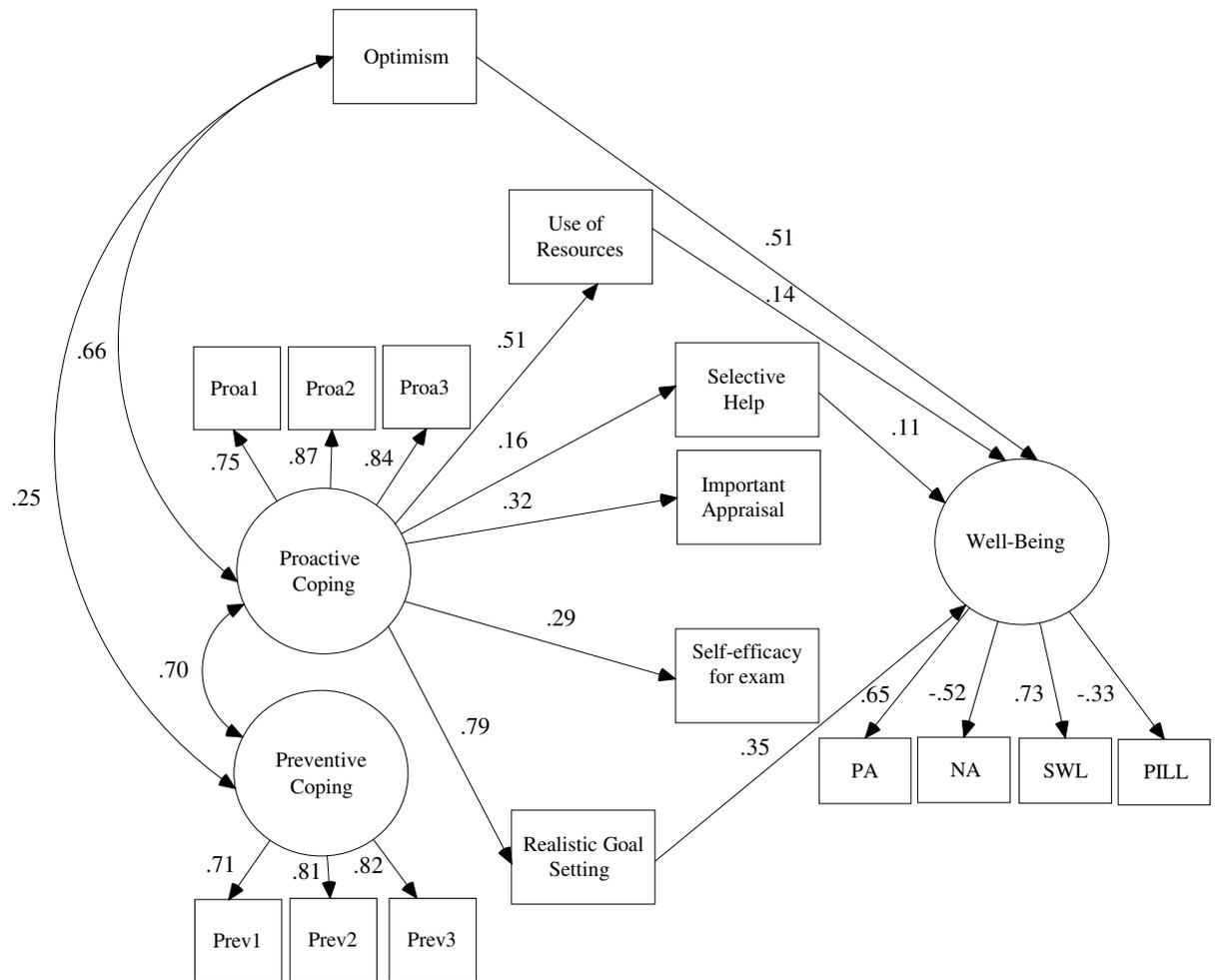
Figure 18. Final model for Hypothesis 9 that added a measure of optimism to the complete model to determine the unique predictive ability of proactive coping, $\chi^2(96, N = 281) = 138.27$, $p = 0.003$; RMSEA = .04, $p = .88$;CFI = .98. All included paths were significant at a $p < .01$ level with the exceptions of Proactive Coping to selective help, selective help to Well-being and use of resources to Well-being ($p < .05$). For simplicity, error terms and values are not shown.

Appendix A
Consent Form

Project Title: The Psychology of Exam Preparation

Principal Investigator: Anne Moyer, Ph.D., Assistant Professor of Psychology

Co-Investigator: Stephanie Sohl, M. A., Graduate Student

RESEARCH CONSENT FORM

Dear Subject,

You are being asked to volunteer in a research study, *The Psychology of Exam Preparation*.

PURPOSE

The purpose of the study is:

To explore the how the quality of preparation for psychology exams influences performance on these exams. Three hundred students preparing for psychology exams will be recruited to help us establish patterns in psychological outcomes, physical symptoms, and exam scores.

PROCEDURES

If you decide to be in this study, your part will involve:

- You will be asked to complete a series of questionnaires online assessing information about you and your feelings about your upcoming psychology exam.
- By consenting to participate, you agree to let the researcher have access to your exam and course grades.
- Your anticipated time commitment will be approximately 1 hour or less.

RISKS/DISCOMFORTS

There are no foreseeable risks or discomforts associated with your participation in this study.

BENEFITS

There are no foreseeable risks or discomforts associated with your participation in this study. However, you will experience how an experiment is conducted.

CREDIT TO SUBJECTS/PAYMENT TO YOU

You will receive course credit based on the time spent participating in the experiment (1 credit toward meeting the course requirement of participation in such research or for extra credit).

CONFIDENTIALITY

We will take steps to help make sure that all the information we get about you is kept private. Your name will not be used wherever possible. We will use a code instead. All the study data that we get from you will be kept locked up. The code will be locked up too. If any papers and talks are given about this research, your name will not be used.

We want to make sure that this study is being done correctly and that your rights are welfare are being protected. For this reason, we will share the data we get from you in this study with the study team, the sponsor of the study (and those who work for them), Stony Brook University's Committee on Research Involving Human Subjects, applicable Institutional officials, and certain federal offices. However, if you tell us you are going to hurt yourself, hurt someone else, or if we believe the safety of a child is at risk, we will have to report this.

In a lawsuit, a judge can make us give him the information we collected about you.

COSTS TO YOU

There are no costs to you for participating in this study.

ALTERNATIVES

Your alternative is not to participate in this study

CONSEQUENCES OF WITHDRAWING

If you withdraw before the completion of the study, you will not receive credit.

SUBJECT RIGHTS

- Your participation is completely voluntary. You do not have to participate if you don't want to.

- You have the right to change your mind and leave the study at any time with out giving any reason, and without penalty.
- Any new information that may make you change your mind about being in this study will be given to you.
- You do not waive any of your legal rights by agreeing to this consent form.

QUESTIONS ABOUT THE STUDY OR YOUR RIGHTS AS A RESEARCH SUBJECT:

If you have any questions about the study, you may contact Dr. Anne Moyer at 631-632-7811 or Stephanie Sohl at 631-828-6352.

If you have any questions about your rights as a research subject, you may contact Ms. Judy Matuk, Committee on Research Involving Human Subjects, 631-632-9036.

If you continue with this survey, it means that you have read (or have had read to you) the information contained in this letter, and would like to be a volunteer in this research study.

Thank you,

Anne Moyer and Stephanie Sohl

Appendix B
Questionnaires

__Notes in bold and italics were for reviewer's information and were not provided to participants.__

__Demographics__

Please tell us some information about you:

What is your solar ID? _____

What is your email? _____

Age: _____

Sex: _____ Male ____ Female

What is your ethnicity?

___ Hispanic or Latino
___ Not Hispanic or Latino

What is your race?

___ American Indian/Alaskan Native
___ Asian
___ Native Hawaiian or Other Pacific Islander
___ Black or African American
___ White
___ Other (please specify) _____

What was your SAT Score? _____

What is your GPA? _____

Proactive Coping - Proactive Coping Inventory (Greenglass, Schwarzer, & Taubert, 1999)

Title of Scale Given to Respondents: *Reactions to Daily Events Questionnaire*

"The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation. Do this by checking the most appropriate box."

1. THE PROACTIVE COPING SUBSCALE

1   I am a "take charge" person.

1	2	3	4
not at all true	barely true	somewhat true	completely true

2   I try to let things work out on their own. (-)

1	2	3	4
not at all true	barely true	somewhat true	completely true

3   After attaining a goal, I look for another, more challenging one.

1	2	3	4
not at all true	barely true	somewhat true	completely true

4   I like challenges and beating the odds.

1	2	3	4
not at all true	barely true	somewhat true	completely true

5   I visualise my dreams and try to achieve them.

1	2	3	4
not at all true	barely true	somewhat true	completely true

6   Despite numerous setbacks, I usually succeed in getting what I want.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

7   I try to pinpoint what I need to succeed.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

8   I always try to find a way to work around obstacles; nothing really stops me.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

9   I often see myself failing so I don't get my hopes up too high. (-)

      1   2   3   4

not at all true   barely true   somewhat true   completely true

10   When I apply for a position, I imagine myself filling it.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

11   I turn obstacles into positive experiences.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

12   If someone tells me I can't do something, you can be sure I will do it.

      1   2   3   4

not at all true   barely true   somewhat true   completely true

13 When I experience a problem, I take the initiative in resolving it.

1	2	3	4
not at all true	barely true	somewhat true	completely true

14 When I have a problem, I usually see myself in a no-win situation. (-)

1	2	3	4
not at all true	barely true	somewhat true	completely true

-Reverse items

2. The Preventive Coping Subscale

1. I plan for future eventualities

1	2	3	4
not at all true	barely true	somewhat true	completely true

2. Rather than spending every cent I make, I like to save for a rainy day.

1	2	3	4
not at all true	barely true	somewhat true	completely true

3. I prepare for adverse events.

1	2	3	4
not at all true	barely true	somewhat true	completely true

4. Before disaster strikes I am well-prepared for its consequences.

1	2	3	4
not at all true	barely true	somewhat true	completely true

5. I plan my strategies to change a situation before I act.

1	2	3	4
not at all true	barely true	somewhat true	completely true

6. I develop my job skills to protect myself against unemployment.

       1   2   3   4

not at all true   barely true   somewhat true   completely true

7. I make sure my family is well taken care of to protect them from adversity in the future.

       1   2   3   4

not at all true   barely true   somewhat true   completely true

8. I think ahead to avoid dangerous situations.

       1   2   3   4

not at all true   barely true   somewhat true   completely true

9. I plan strategies for what I hope will be the best possible outcome.

       1   2   3   4

not at all true   barely true   somewhat true   completely true

10. I try to manage my money well in order to avoid being destitute in old age.

       1   2   3   4

not at all true   barely true   somewhat true   completely true

Optimism - LOT-R (Scheier, Carver, & Bridges, 1994)

Please be as honest and accurate as you can throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect" answers. Answer according to your own feelings, rather than how you think "most people" would answer.

1. In uncertain times, I usually expect the best.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

[2. It's easy for me to relax.]

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

3. If something can go wrong for me, it will.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

4. I'm always optimistic about my future.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

[5. I enjoy my friends a lot.]

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

[6. It's important for me to keep busy.]

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

7. I hardly ever expect things to go my way.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

[8. I don't get upset too easily.]

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

9. I rarely count on good things happening to me.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

10. Overall, I expect more good things to happen to me than bad.

A = I agree a lot
B = I agree a little
C = I neither agree nor disagree
D = I DISagree a little
E = I DISagree a lot

Proactive Competence Scale (PCS; Bode, Ridder, Kuijer, Bensing, 2007)

1. I am able to really do what I wanted to do.

	1	2	3	4

Not at all able   Very able

2. I am able to maintain.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

3. I am able to make realistic plans.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

4. I am able to translate my wishes into plans.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

5. I am able to find solutions.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

6. I am able to recognize my own barriers.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

7. I am able to recognize my possibilities and opportunities.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

8. I am able to find alternatives if one solution does not work.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

9. I am able to take a moment to appreciate my successes.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

10. I am able to learn from setbacks.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

11. I am able to reward myself for things that go well.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

12. I am able to see the positive sides to failure.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

13. I am able to check to see if I accomplish what I want to.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

14. I am able to assess future developments.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

15. I am able to anticipate the future.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

16. I am able to appraise my environment.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

17. I am able to recognize first signals of undesired changes.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

18. I am able to ask for social support.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

19. I am able to ask for support when things become difficult.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

20. I am able to be open for suggestions and advice from others.

| 1 | 2 | 3 | 4 |

Not at all able   Very able

21. I am able to listen to my body

| 1 | 2 | 3 | 4 |

Not at all able   Very able

Resources

Time management

1. Do your plan your classes for the semester so that they vary in difficulty?

| 1 | 2 | 3 | 4 |

  Not at all   Somewhat   Usually   Always

2. To what extent do you make time to study?

| 1 | 2 | 3 | 4 |

| I don't study | I study when I find time | I plan to study but can't always stick to it | I plan when to study and usually do |

Social support

1. How many people do you have near you that you can readily count on for help in times of difficulty, such as to borrow notes, give rides to hospital or store, or help when you are sick?

A. 0
B. 1
C. 2-5
D. 6-9
E. 10 or more

Competing Demands

How many credits are you taking this semester?

1	2	3	4
Less than 12	12 – 15	16-19	more than 19

How many hours do you work (if you have a job outside of school)?

1	2	3	4
I don't work	0-10	11-20	20 or more

Attention Recognition

3-tems from Proactive Competence Scale

Primary Appraisals

How important is the upcoming Psychology exam to you?

1	2	3	4	5	6	7
not at all important						extremely important

How stressful do you expect the upcoming exam to be?

1	2	3	4	5	6	7
not at all stressful						extremely stressful

How challenging do you find the upcoming exam to be?

1	2	3	4	5	6	7

not at all   extremely
challenging   challenging

How threatening do you find the upcoming exam?

1	2	3	4	5	6	7

not at all   extremely
threatening   threatening

Preliminary Coping

Secondary Appraisals

1. How effectively did you feel you are able to prepare for the Psychology exam?

1	2	3	4	5	6	7	8	9	10

not at all effectively   very effectively

2. How much control do you feel you have over the outcome?

1	2	3	4	5	6	7	8	9	10

no control   complete control

Coping - Study habits

3. To what extent did you read since the last test?

1	2	3	4

I didn't read I just read right I mostly kept up I read before each
 at all   before the exam with the reading   class

4. How regularly do you attend lectures?

1	2	3	4

I just attend for I attend about I attend about I attend almost
the exams   1/3 of the time 2/3 of the time every class

5. To what extent have you started studying for the test?

1	2	3	4
I haven't started	I went to the review session	I have started to study	I have studied all of the material

Realistic Goal Setting - 8 items from the PCS

Elicit and Use Feedback

Adjust from Previous

1. What was your grade on the last exam? ____/50

2. Were you content with your performance on the last exam?

1	2	3	4	5
Not at all content				Extremely content

3. What statement is true of your study habits based on your previous performance?

    A. My study habits <u>did not</u> change because I <u>was</u> satisfied
    B. My study habits <u>did not</u> change even though I <u>was not</u> satisfied
    C. My study habits <u>did</u> change because I <u>was not</u> satisfied
    D. My study habits <u>did</u> change even though I <u>was</u> satisfied

Outcome Expectations

1. What grade are you honestly aiming for? ____/50

2. How confident are you that you will attain the grade you are seeking?

1	2	3	4	5
Not at all confident				Extremely confident

Use of Feedback: 6-items from PCS

Well-Being

Affect – PANAS (Watson, Clark, & Tellegen, 1988)

Directions

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you felt this way in the past week.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Physical Symptoms - The PILL (Pennebaker, 1992)

Several common symptoms or bodily sensations are listed below. Most people have experienced most of them at one time or another. We are currently interested in finding out how prevalent each symptom is among various groups of people. On the page below, write how frequently you experience each symptom. For all items, use the following scale:

A Have never or almost never experienced the symptom
B Less than 3 or 4 times per year
C Every month or so
D Every week or so
E More than once every week

___1. Eyes water
___2. Itchy eyes or skin
___3. Ringing in ears
___4. Temporary deafness or hard of hearing
___5. Lump in throat
___6. Choking sensations
___7. Sneezing spells
___8. Running nose
___9. Congested nose
___10. Bleeding nose
___11. Asthma or wheezing
___12. Coughing
___13. Out of breath
___14. Swollen ankles
___15. Chest pains
___16. Racing heart
___17. Cold hands or feet even in hot weather
___18. Leg cramps
___19. Insomnia or difficulty sleeping
___20. Toothaches
___21. Upset stomach
___22. Indigestion
___23. Heartburn or gas
___24. Abdominal pain
___25. Diarrhea
___26. Constipation
___27. Hemorrhoids

___28. Swollen joints
___29. Stiff or sore muscles
___30. Back pains
___31. Sensitive or tender skin
___32. Face flushes
___33. Tightness in chest
___34. Skin breaks out in rash
___35. Acne or pimples on face
___36. Acne/pimples other than face
___37. Boils
___38. Sweat even in cold weather
___39. Strong reactions to insect bites
___40. Headaches
___41. Feeling pressure in head
___42. Hot flashes
___43. Chills
___44. Dizziness
___45. Feel faint
___46. Numbness or tingling in any part of body
___47. Twitching of eyelid
___48. Twitching other than eyelid
___49. Hands tremble or shake
___50. Stiff joints
___51. Sore muscles
___52. Sore throat
___53. Sunburn
___54. Nausea

In the past month, how many:

_____ Visits have you made to the student health center or private physician for illness
_____ Days have you been sick
_____ Days your activity has been restricted due to illness

Satisfaction with Life Scale (SWL; Diener, Emmons, Larsen, & Griffin, 1985)

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

_____ In most ways my life is close to my ideal.

_____ The conditions of my life are excellent.

_____ I am satisfied with my life.

_____ So far I have gotten the important things I want in life.

_____ If I could live my life over, I would change almost nothing.

Appendix C
Debriefing Form

Debriefing Form: Writing and Exam Preparation

Thank you for participating in our study! Research projects such as this would not be possible if it were not for the contribution of your time. We greatly appreciate it.

The study you just participated in aims to explore individual differences in future-oriented coping and to explain how these differences influence outcomes such as well-being and performance.

In order to investigate these ideas, we had you answer standardized questionnaires measuring Optimism (LOT-R; Scheier, Carver, & Bridges, 1994), Proactive Coping and Preventive Coping (PCI; Greenglass, Schwarzer, & Taubert, 1999), Proactive Competence (PCS; Bode, Ridder, Kuijer, Bensing, 2007), Satisfaction with Life (SWL; Diener, Emmons, Larsen, & Griffin, 1985), Perceived Stress (Cohen, Kamarck, & Mermelstein, 1983), Affect (PANAS; Watson, Clark, & Tellegen, 1988), and Physical Symptoms (PILL;(Pennebaker, 1992). We also considered your background characteristics and study habits.

We hope that that participating in this study was interesting to you and that the results of this research will increase the general understanding of how people cope with future stressors.

If this study caused you any stress and you would like to talk to a counselor, please call us for referrals. In addition, if you have any complaints, concerns, or questions about this research, please feel free to contact: Dr. Anne Moyer at 631-632-7811 or Stephanie Sohl at 631-828-6352.

If you are interested in this area of research, you may wish to read the following references:

Stress News: http://www.isma.org.uk/stressnw/proactive.htm

Aspinwall, L.G. & Taylor, S.E. (1997). A stitch in time: Self-regulation and proactive coping. *Psychological Bulletin*, *121,* 417-436.

We would ask you to maintain confidentiality about the purpose of the experiment since any pre-knowledge of the purpose will bias the data for that person and thus cannot be used.

Thank you again!