HAVING THE TIME OF OUR LIVES?
HOW THREAT APPRAISAL IS INFLUENCED BY THE SUBJECTIVE NATURE OF TIME

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Abstract

Temporal construal is the cognitive process that determines an event's location in time and the experience of its distance from the present. The greater the temporal distance, the more likely events are represented in abstract versus concrete features. This experiment examined temporal construal's effect on threat appraisal of a stressful medical procedure, where the manipulation involved university students imagining the procedure in concrete or abstract terms. The near-future group was expected to interpret the procedure as nearer and more threatening than the distant-future group on questionnaires. An Implicit Association Test (IAT) measured response latencies during categorization of stimuli into paired concepts (threat and time). A significant interaction was found between a personality trait and temporal construal on the perceived distance of the procedure, $t(189) = 2.14$, $p = .03$. IAT results found that participants were faster at categorizing stimuli into congruent versus incongruent pairs, $t(179) = 4.05$, $p < .001$.

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Chapter 1: Introduction

Having The Time Of Our Lives?

How Threat Appraisal Is Influenced By The Subjective Nature Of Time

Each individual has a unique concept of time; one may see an event as being nearer or farther in the future than their neighbor. For example, if two people are scheduled to get a tooth extracted on the same day, one may view the procedure as coming up right around the corner, whereas the other may see it as ages away. Thus, these two individuals may feel threatened about the aversive procedure to varying degrees based on their different perspectives. Why might differences in perspectives of time exist? One reason may be due to the association between the construal of an event and its psychological distance, which could affect an individual's appraisal of a situation and their subsequent level of stress. Understanding the cognitive factors involved in appraisal of events is pivotal to understanding and predicting stressful reactions in individuals.

One theory that is widely used to study people's stressful reactions is the transactional theory of stress model (Folkman & Lazarus, 1988). According to this model, cognitive appraisal mediates the stressfulness of an event. Psychological stress occurs when an individual appraises his or her environment as exceeding their resources and endangering their well-being, where appraisal is defined as the process of evaluating or categorizing the personal significance of events. When exposed to a potential stressor, people first assess whether the stressor may challenge or threaten their well-being, which is a cognitive process known as primary appraisal. They then engage in secondary appraisal, in which the various coping options for dealing with the perceived stressor are appraised. It is primarily concerned with the evaluation of what can be done about the situation. Finally, people engage in coping behaviours in an attempt to deal with the stressor. It is important to study how a person construes a stressor in specific situations and

the measures that they perceive may be taken to combat the effect of threatening appraisals. When there are few perceived coping resources, psychological and physical illnesses may result. Therefore, in order to preserve psychological health, appraisals of threat should be accompanied by options for successful coping with the event.

Temporal Construal

According to *construal level theory*, appraisal of threat depends on differing mental representations of objects according to their psychological distance from the person (Liberman & Trope, 1998; Trope & Liberman, 2003). It suggests that the same event or object can be represented at two levels: high-level construals and low-level construals. High-level construals (the "why") capture the superordinate, central features of an object or event, and these abstract representations convey the general features and meaning of the event. Low-level construals (the "how") consist of subordinate, concrete, and contextual details of events, which are unique and easily come to mind. Because time is but one aspect of psychological distance, *temporal construal* defines the cognitive process that determine an event's location in time and the subjective experience of how near or far an event is from the present moment. According to this theory, people use higher-level construals to represent information about *distant-future* events and lower-level construals to represent information about near-future events. The greater the temporal distance, the more likely events will be represented in terms of a few abstract features that convey the perceived essence of the event (high-level construals) as opposed to concrete and incidental features (low-level construals).

Time is important in many respects, but particularly because of its influence on the construal of an event or object and the implications of this construal. Research has shown that distant-future events, as compared to near-future events, are more influenced by the desirability (high-level construal) of attaining an end state and less by the feasibility (low-level construal) of

attaining the end state (Liberman & Trope, 1998). Furthermore, the weight of goal-relevant features (high-level construal features) compared to goal-irrelevant features (low-level construal features) is greater in determining distant-future preferences than near-future preferences (Trope & Liberman, 2000). Finally, distant-future events are construed in higher-level, abstract terms compared to near-future events which are construed in lower-level, concrete terms; this has been demonstrated by object categorization, affective experiences, coping experiences, and preferences for activities (Liberman, Sagristano, & Trope, 2002).

Trope and Liberman suggest that temporal construal occurs as a result of the availability heuristic that evolved from repeated associations between temporal distance and people's knowledge about future situations. Usually, low-level information regarding distant-future events is unreliable or unavailable until the event becomes closer in time. The details about the concrete aspects of future events, the context in which they will occur, and alternative scenarios or courses of action become available and clear only as one gets closer in time to the event. Also, people often delay or change their decisions regarding distant-future events, which may allow them to postpone consideration of low-level information until they get close in time to the event. Therefore, an association may be established between temporal distance and level of construal, where distant-future events activate high-level construals and near-future events activate low-level construals.

Not only can perception of time affect the construal of an event, but construal level can also influence perception of time. Of the finite research that has been done to support this theory, Liberman and colleagues (2007) demonstrated in a series of experiments how the concrete construal of an event leads to perceptions of the event in the near-future and that abstract construals of an event elicit distant-future perceptions. In particular, asking participants to focus on why an event occurs versus how during the construal of activities performed by others, as well

as one's own goals, elicited the perception that the event or activity occurred in the distant-future as opposed to the near-future. Moreover, directing participants to focus on objects versus personality traits and on concrete versus abstract construal of activities, elicited a similar perception of the activity occurring in the distant-future. In a second experiment, Stephan, Liberman, and Trope (2011) investigated time perception and construal level on social distance, finding that the expectation of having a temporally remote social interaction with a person produced greater social distance in terms of reduced familiarity and similarity to the self. Further, higher-level construals of the target person resulted in less familiarity and allocation of resources than lower-level construals. The aforementioned evidence suggests that the temporal distance of an event is perceived as closer in the future as the event is described in more concrete, lower-level terms.

Construal level has also been shown to affect phenomena related to time such as delay of gratification. Research by Mischel (1974, 1989) has shown that in children as early as preschool age, immediate gratification may be delayed in goal-related behaviour for the sake of later outcomes, which can be explained by construal level theory. How children represent rewards cognitively determines how long they delay gratification; when rewards were presented in concrete terms ("imagine the chewy, sweet, soft taste of a marshmallow") versus abstract terms ("imagine a marshmallow as a white, puffy cloud"), there was a shorter delay in children's gratifying their desire for the reward.

Construal Level and the Health Context

This phenomenon of the temporal distance of an event influencing construal level can also be seen in research relating the likelihood of events to the way they are represented. Sherman and colleagues (1983) demonstrated that an event is subjectively more likely to occur when details regarding the event are easy to retrieve than when they are difficult to retrieve. This

effect is based on the availability heuristic, when facts are readily available in memory at the time of judgment. This phenomenon has also appeared in a health-related context where subjects who were able to easily picture contracting a disease (concrete construal), rated the likelihood of contracting the disease as greater than those who pictured a disease with difficult–to–imagine symptoms (abstract construal; Sherman et al., 1985). The implications of these results could include individuals' reduced compliance with preventive medical procedures, which could lead to a diminished quality of health.

Moreover, an association has been shown to exist between expected and actual pain during medical procedures. Various studies have shown that the fear and expectation of pain from a threatening procedure can exacerbate the actual pain felt, as in a self-fulfilling prophecy. For example, patients who were scheduled to undergo surgery and expected the amount of pain to be high indicated greater pain ratings and required more pain medication post-surgery than those who did not anticipate as much pain (Logan & Rose, 2005). In a similar study, selective attention to threatening information was shown to increase pain during a cold-pressor task (McGowan et al., 2009). The cold-pressor task is an experimental technique to induce pain in humans and involves placing a hand or forearm in cold water, which produces a gradual painful sensation of mild to moderate intensity and ends when the subject removes their limb from the water. The cold-pressor task measures pain threshold, tolerance, pain intensity and distress (through ratings), as well as stress hormonal and autonomic/cardiovascular responses (von Baeyer et al., 2005). In McGowan and colleagues' study, when provided with threat-inducing information about a stressful cold-pressor task, those who attended to pain-related stimuli versus neutral stimuli had increased pain ratings and decreased tolerance and threshold levels during the task. Those people who are more threatened by medical procedures are therefore more likely to expect to experience pain and perhaps avoid the procedure altogether.

Zimbardo's Time Perspective Theory

Zimbardo offers another view of time, which he labels "time perspective" (TP) (Zimbardo & Boyd, 1999; 2008; Boniwell & Zimbardo, 2003). TP is a nonconscious process whereby temporal categories sort personal and social experiences into time frames (past, present, and future) that provide meaning to these events. The TPs greatly influence crucial judgments, decisions, and actions in everyday life. When making decisions, a person may have a tendency to overemphasize one of the three time frames, creating a bias toward being past, present, or future oriented. This can then become a dispositional style over time, creating an over reliance on a certain temporal frame when making everyday decisions. TP is situation dependent and varies among individuals and ideally, a person should aim for a balanced TP, allowing them to switch between different time frames depending on the situation.

Since TP is so pervasive and determined by many different factors, its influence (regarding goal setting, social networks, risk taking, addiction, and many other factors) is rarely noticed. For example, in a study investigating social network connections and coping (Holman & Zimbardo, 2009), different time perspectives were correlated with quality of social relationships. Past-positive TP was related to large networks and high family support; past-negative was associated with low support and high family conflict; large networks with support from friends characterized present-hedonistic TP; and future TP was associated with supportive significant others. In a study investigating risky driving, Zimbardo and colleagues (1997) found that present TP correlates highly with reported risky driving behaviours. A gender difference was also observed, where males were found to be more present-oriented and report that they take more risks when driving a car than females, who are generally more future oriented.

Zimbardo created a scale based on his theory regarding time perspective, the *Zimbardo Time Perspective Inventory (ZTPI)*, which consists of five factors. The first factor, *past-negative*,

involves a negative view of the past, reflecting traumatic events that have happened to a person in the past or good things that they have missed out on. The second factor, *present-hedonistic*, describes an impulsive, risk-taking attitude toward life, focusing on present pleasure with little consideration for future consequences. The third factor is *future*, which characterizes striving for future goals and rewards. *Past-positive* is the fourth factor, and it includes a warm, pleasurable attitude regarding the past, such as reminiscing about cherished childhood memories. The fifth and final factor is *present-fatalistic*, which exemplifies a helpless and hopeless attitude toward the future and life in general, including having little control over one's life.

Coping and Threat Appraisal

One variable that has been identified as diminishing the appraisal of threat is coping- in particular, proactive coping (Greenglass, 2002). The present study focused on proactive coping and how engaging in this coping strategy can help diminish the appraisal of threat due to a stressful event. Proactive coping is a coping strategy associated with perceiving demands as challenges rather than threats (Greenglass et al., 1999). It is a multidimensional and forward-looking coping strategy that integrates processes of personal quality of life management with those of self-regulatory goal attainment. Proactive coping is future-oriented and consists of efforts to build up general resources that facilitate promotion of challenging goals and personal growth. It also differs from traditional or more reactive conceptions of coping in that proactive coping is seen as more positive than in traditional coping and situations are seen as challenging and stimulating, whereas reactive coping originates from risk appraisal. Reactive coping refers to harm or loss experienced in the past, whereas proactive coping involves future challenges that are seen as self-promoting (Schwarzer & Knoll, 2003). Considerable research findings indicate variability in the use of proactive coping among individuals, thus leading to the observation that proactive coping is an individual difference variable which is associated with diminished distress,

physical and psychological disability (Greenglass, Marques, deRidder, & Behl, 2005; Greenglass, Fiksenbaum, & Eaton, 2006), and an increase in vigor and positive affect (Uskul & Greenglass, 2005; Greenglass, 2006).

Many different resources may buffer the impact of stress outcomes. The buffering hypothesis, proposed by Cohen and Wills (1985), suggests that under some conditions, social support protects, or buffers, individuals from the potentially harmful effects of experiencing a stressful event. Research has demonstrated that social support as a coping mechanism can buffer the effect of stress (Greenglass, Fiksenbaum, & Burke, 1996; Penninx et al., 1997). Since proactive coping is a positive coping resource, like social support, proactive coping was hypothesized to have a buffering effect on the appraisal of a stressor as a threat and was therefore tested in the present study as a moderator of perceptions of threat.

The Present Study

The purpose of the present study was to provide evidence for the influence of temporal construal on threat appraisal of a stressful event and the moderating effect of proactive coping on this interaction. The study was based mainly on Trope and Liberman's (2003) temporal construal theory, but also incorporated threat as an additional variable. Although Zimbardo has been very influential in the area of time perspective, his research is mainly correlational which does not allow for inference of causation. However, since his scale, the ZTPI, has good reliability and validity, part of the questionnaire was utilized to correlate with perceptions of threat and proactive coping since an individual may have a trait capacity to think in a typical temporal mindset, i.e. in the past, present, or future. Therefore, it was crucial to assess whether this dispositional tendency interacted with the experimental time manipulation. Trope and Liberman have experimentally demonstrated that construal and time have a bidirectional relationship as indicated in their aforementioned research (Liberman & Trope, 1998; Liberman, Sagristano, &

Trope, 2002; Trope & Liberman, 2000; 2003; Stephan, Liberman, & Trope, 2011). Thus, construal level was manipulated in the present study to create different perceptions of time. Participants were instructed to focus on either the concrete or abstract details of a future stressful medical procedure and their appraisal of threat was subsequently measured. It was expected that those who focused on the concrete details (low-level construal) of the stressful procedure should view it as closer in time than those who were asked to think about the abstract features (high-level construal) of the procedure. Individuals instructed to focus on the abstract features of the procedure were predicted to view it as farther away in time due to their differing construal of the situation.

The experimental manipulation consisted of two conditions—near-future and distant-future—where an excerpt about a medical procedure (having blood drawn from one's arm with a hypodermic needle) was presented for participants to read, with differing construal levels. In the near-future condition, participants were instructed to focus on concrete aspects of the procedure and those in the distant-future condition read the excerpt which instructed them to focus on the abstract details of the procedure. Threat associated with the procedure was then measured explicitly, through a stress appraisal questionnaire (Stress Appraisal Measure; Peacock & Wong, 1990), and pain was also measured explicitly by an item that asked participants to rate the extent of their anticipated pain due to the medical procedure. It was hypothesized that threat be significantly higher in the near-future condition than in the distant-future condition.

Threat was also measured implicitly to discover whether participants have a non-conscious bias toward associating concepts of threat and near-future, and non-threat and distant-future concepts. Threat was measured implicitly through the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). It was predicted that threatening concepts in general would have a significantly greater association with near-future concepts than the association

between threatening and distant-future concepts as measured by response latencies (in milliseconds) to correctly categorizing words. Also, non-threat and distant-future were thought to be more strongly associated than threat and distant-future concepts.

The Stress Appraisal Measure is a measure of the extent to which people feel threatened due to their current situation (the medical procedure) and the IAT is a measure of the strength of association between two concepts (threat and temporal construal). The proposed theory is that people who attend to concrete cues when anticipating a stressful event (such as a medical procedure) are more likely to be threatened by the event than those who attend to abstract features, since the more an individual focuses on the concrete, arousing qualities of a painful procedure, the more intense and aversive the event becomes.

Conversely, cognitive representation of the same procedure that focuses on the abstract or less arousing qualities should enable a person to feel less threatened. Focusing on the concrete details of a stressful event is thought to make the event seem closer in time, and more threatening, than focusing on abstract details of the event, whereas focusing on the abstract details should give the perception of the event as being farther away in time and less threatening. Those who tend to be higher in proactive coping were thought to appraise the stressful medical procedure as less threatening in the near-future condition compared to people who engage in proactive coping to a lesser degree, in line with the stress buffering hypothesis (see Figure 1).

Hypotheses

1. Threat should be higher for participants in the near-future condition than in the distant-future condition.
    a. Participants in the near-future condition should indicate the stressful event as more threatening on the explicit Stress Appraisal Measure—which indicates the

extent to which participants feel threatened due to their current situation—than those in the distant-future condition.

b. Participants in the near-future condition should be faster at associating "near time" words with negative words during the Implicit Association Test—which measures the strength of association between the concepts of threat and time—than those in the distant-future condition.

2. Proactive coping should moderate threat appraisals such that those who are higher in proactive coping should experience less threat in the near-future condition than those low in proactive coping.

Chapter 2: Method

Design

There was one independent variable in this study—temporal construal—with two levels: near-future and distant-future. The participants were randomly assigned to one of the two conditions: near-future or distant-future. There were two dependent variables: one, a self-report measure of threat associated with the stressful event, and the other, an implicit measure of threat associated with the stressful event. The IAT was employed, which measures associations between concepts that one may be unaware of on a conscious level. Proactive coping and Time Perspective were assessed and employed as moderating variables.

Participants

Undergraduate students enrolled at York University in Toronto were recruited to complete the study. If students were currently taking an Introduction to Psychology course, they could sign up for the study through the Undergraduate Research Participant Pool (URPP) and receive one experimental credit toward their course grade for their participation. Those students attending York University but not enrolled in an Introduction to Psychology course received an entry into a draw for a chance to win one of ten gift cards or a Samsung Galaxy electronic tablet upon participation. The latter sample of students were recruited through posters, email list serves, and personal communication.

There were 202 participants recruited for the study altogether, however some were eliminated due to various factors. The final sample (N = 195) consisted mainly of female participants (n = 109) whereas 83 males participated; their ages ranged from 17 to 48 (M = 22). Most students were completing their first year of undergraduate studies at the time (n = 63) and belonged to the Faculty of Health (n = 50). The majority of individuals spoke English as a first language (n = 115), and a minute number were afflicted with a medical condition, the most

common being a respiratory condition (n = 9). Table 1 presents detailed demographic information for the total sample.

Twenty students from York's URPP participated in a pilot study (age range: 18-23) to establish the effectiveness of the temporal construal manipulation and to ensure that the experiment ran smoothly. The participants from this pilot study were included in the sample for the actual study.

Materials

The study was conducted in a computer lab at York University, seating approximately 10 people at a time, where each student was assigned his or her own computer to complete the experiment. All parts of the experiment were presented and completed on the computer. The questionnaires were programmed through Qualtrics, which is software that allows users to collect and analyze data online (http://www.qualtrics.com). One important feature regarding Qualtrics is its ability to be programmed to randomize participants to conditions. The study took approximately 30-40 minutes in total to complete (refer to Appendix A for an outline of the study procedure).

Independent Variable

Temporal construal. The manipulation of temporal construal was based on the procedure employed by Liberman, Trope, McCrea, and Sherman (2007) and involved instructing participants to imagine themselves experiencing a stressful medical procedure: having a blood sample drawn with a hypodermic needle. In the near-future condition, participants were directed to focus on the concrete features of the procedure (the bodily sensations they would feel, the examination room where they would be seated, and the medical tools used to conduct the procedure), whereas those in the distant-future condition were directed to focus on the abstract features of the procedure (the purpose of having the procedure done, how it is important for their

health, and how it would ultimately benefit them). Instructions for this manipulation can be found in Appendix B. As previously indicated, the manipulation was first tested with a pilot sample from the URPP.

The hypothetical medical procedure described represents a modified item from the *Fear of Pain Questionnaire – III* (McNeil & Rainwater, 1998), which describes painful experiences and measures how fearful one is of experiencing the pain associated with each. The scale consists of items which ask individuals to indicate their fear of pain associated with a certain painful event on a Likert scale ranging from 1 *(not at all)* to 5 *(extreme)*. The sample item used was, "Having a blood sample drawn with a hypodermic needle". The item was chosen from this scale because it provided good examples of threatening medical procedures that were appropriately suited for the manipulation.

Moderating Variables

Proactive coping measure. The proactive coping subscale of the Proactive Coping Inventory (Greenglass, 1998) was completed by participants. This measures the extent to which they use proactive coping when coping with various stressful situations (see Appendix C). There are 14 items measured on a Likert scale ranging from 1 (*not at all true*) 4 (*completely true*). A sample item is, "I like challenges and beating the odds". This scale was chosen because it is reliable and valid and is a fundamental measure of proactive coping.

Time Perspective measure. Three of Zimbardo's Time Perspective Inventory (Zimbardo & Boyd, 1999) subscales were used to measure individuals' tendencies of thinking in a certain temporal frame of mind (see Appendix D). The three subscales—*future*, *present-hedonistic*, and *present-fatalistic*—were correlated with scores on the Stress Appraisal Measure and Proactive Coping Inventory to ensure that thinking in a specific temporal frame of mind does not interact with the temporal construal manipulation. These subscales are most applicable to this study

because participants evaluated their threat in the *present* based on a hypothetical *future* event. Therefore, the *future*, *present-hedonistic*, and *present-fatalistic* subscales would be most likely to interact with the manipulation. Participants indicated how true or characteristic each item is of them on a Likert scale ranging from 1 (*very uncharacteristic*) to 5 (*very characteristic*). A sample item is, "Fate determines much in my life". The scale originally included 56 items, but the items from the three subscales total 37.

Dependent Variables

Explicit threat measure. The explicit measure used to assess threat appraisal of the medical procedure was Peacock & Wong's (1990) Stress Appraisal Measure (SAM). The SAM was developed to measure theoretically important dimensions of both primary and secondary appraisal. Three primary appraisal scales measure primary appraisal dimensions relevant to anticipatory stress: threat, challenge, and centrality. For the purposes of this study, the "threat" subscale of the SAM was used in order to measure the threat associated with the stressful medical procedure (see Appendix E). The items were tailored to specifically address the threatening medical procedure. Four items measured the extent to which people felt threatened by their current situation on a Likert scale ranging from 1 (*not at all*) to 5 (*extremely*). A sample item is, "How threatening is this medical procedure?" An additional item was also included which asked participants, "How painful do you think this medical procedure would be?" utilizing the same scale from 1 (*not at all*) to 5 (*extremely*). This scale was chosen because it is a reliable and valid measure of threat and the items are relevant to the manipulation. It has also been shown to be a good measure of financial threat when investigating the psychological effects of the recent economic recession (Marjanovic, Greenglass, Fiksenbaum, & Bell, 2013).

Implicit threat measure. An implicit measure of threat associated with temporal construal was used in the present study—where students imagined a threatening medical

procedure—through the IAT. This test has been used extensively in the past to measure people's implicit attitudes about commonly stigmatized groups (Greenwald, McGhee, & Schwartz, 1998). However, the test was adapted here to investigate people's associations between temporal construal and threat. Bar-Anan, Liberman, and Trope (2006) have demonstrated an association between psychological distance and construal level by creating an adapted version of the IAT, and they showed that people are capable of creating associations such as these without picturing themselves or another person engaging in the activity.

In a similar fashion, the theory of whether threat can then be associated with temporal construal was investigated in the current study. It was expected that threat [represented by threatening (negative) and non-threatening (positive) words] would be associated with temporal distance (represented by near-time and distant-time words). In particular, threatening words should be more strongly associated with near-time words than distant-time words and thus reaction times should be shorter in the former condition than in the latter. Non-threatening words should be more strongly associated with distant-time words than near-time words and thus reaction times should be shorter in the former than in the latter condition upon presentation of the temporal construal manipulation. Thus, if a participant read the concrete description of the medical procedure, he or she should be more likely to view the event as occurring closer in time and be more threatened by it. Therefore, the concepts "threat" and "near-time" should be more strongly associated in their minds than "threat" and "distant-time", or "non-threat" and "near-time" (Bar-Anan et al., 2006).

On the other hand, participants who read the abstract description of the medical procedure should view the event as occurring farther away in time and be less threatened by it, hence the concepts "threat" and "near-time" would not be as strongly associated in their minds as in the concrete condition; rather, "non-threat" and "near-time" should be more closely associated.

Therefore, participants in the **near-future condition** (who should view the medical procedure as more threatening) were expected to be faster at categorizing a near-time word when it was paired with a negative word rather than when paired with a positive word. The associations are strong between *near-time* and *threat* if a person is threatened by the medical procedure, therefore they should be faster at choosing the category that pairs the near-time and threatening words together than people who are not as threatened by the procedure (distant-future condition) (Greenwald, McGhee, & Schwartz, 1998). On the other hand, people in the **distant-future condition** should be slower at categorizing a near-time word when it is paired with a threatening word than people in the near-future condition because the association between *near-time* and *threat* is not as strong. Refer to Appendix F for specific IAT instructions; see Figure 2 for stimuli used.

Conscientious Responder Check

Recent research has indicated that there may be a tendency for participants to respond randomly to questionnaires, thus affecting the validity of one's research findings. In order to determine the extent of this tendency, Marjanovic et al.'s (2014) Conscientious Responders Scale was used to distinguish conscientious responders (those who infuse their responses with meaning about their inner psychological workings) from random responders (those who answer items without regard for what they mean). The scale consisted of five instructional items to identify the two types of responders and they were embedded randomly throughout the online questionnaire in the study. By identifying random responders, their responses can then be removed so as to not bias the results of the analyses. Participants selected the option which was instructed of them in the item on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A sample item is, "To answer this question, please choose option number four, 'neither agree nor disagree'". Refer to Appendix G for complete scale.

Procedure

The participants began the study by coming into the computer lab and indicating on the consent form that they agreed to participate (see Appendix H). As a cover story, they read on the computer screen that they would be participating in a study on "construction of medical procedure debriefings", which examines how people interpret different medical procedures they read about and what general impressions are created by different explanations so that health professionals can create more informative and tactful descriptions about their procedures. The participants then completed the proactive coping subscale of the Proactive Coping Inventory online.

Next, for the temporal construal manipulation, instructions appeared on the computer indicating that the students are to imagine the medical procedure described (priming concrete or abstract construal). Participants were randomly assigned to the experimental conditions. Immediately after this, a manipulation check was administered to evaluate whether the temporal construal manipulation was effective (see Appendix B). The first question, based on Liberman, Trope, McCrea, and Sherman (2007), asked participants, "If it were to actually happen to you, how far away from now (in days) would you view this upcoming medical procedure occurring?" in order to measure objective psychological distance. A second question to measure subjective distance asked participants, "How far away do you view your upcoming medical procedure [on a scale from 1 (*very close*) to 10 (*very far*)]?

After the manipulation check, the participants completed the Stress Appraisal Measure, which subjectively assessed the degree to which the medical procedure was construed as threatening. Instructions then appeared on the computer about how students are to complete the next task—the IAT. Participants completed the IAT using Inquisit software, which is a tool for

administering precision cognitive measures in the lab and over the web (http://www.millisecond.com).

Upon completion of the IAT, the participants completed three subscales of the Zimbardo Time Perspective Inventory (Present Fatalistic, Present Hedonistic, and Future) and answered demographic questions (see Appendix I) as well as three questions measuring the potential influence of demand characteristics, which concluded the study (Orne, 1962; see Appendix J). For example, the first question was, "As far as you can recall, what was the purpose of this study?" Finally, participants read a paragraph providing a debriefing of the experiment (see Appendix K).

Focusing on concrete features of an event should elicit thoughts that the event will occur in the near future, and focusing on abstract features was expected to elicit thoughts that the event will happen in the distant future. Therefore, as previously stated, participants in the near-future condition should feel more threatened by the medical procedure and see it as closer in time (as indicated by fewer days away) and that those in the distant-future condition be more threatened and see the procedure as farther away (indicated by greater number of days away). Furthermore, those in the near-future condition who are high in proactive coping should feel less threatened and view the procedure as farther away than participants who score lower on proactive coping.

Chapter 3: Results

Preliminary Analyses

Prior to testing the hypotheses, the data were screened for accuracy by identifying outliers and examining the distribution of data. Four cases were removed due to extreme scores on Check 1, "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Further, individuals were tested on conscientiousness of responses on Marjanovic et al.'s (2014) Conscientious Responders Scale (CRS). Five items were randomly embedded throughout the questionnaires which instructed responders to choose a specific option on a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). If individuals scored less than three out of five (one point for each correct response), their data were removed from the sample so as not to bias the results. Three random responders were identified and their responses were removed from the data set.

Each variable's distribution was then examined in turn to identify skewed distributions through histograms and skew and kurtosis statistics (see Appendix L). There were two variables which displayed non normal data: Check 1 and threat; these variables then underwent a log transformation in an attempt to reduce the skewness (Field, 2013). Figures 7 – 10 display histograms of Check 1 and threat before and after being transformed; see also Tables 39 – 42 for skew values before and after the log transformations of Check 1 and threat. Table 3 provides the descriptive statistics for the entire sample.

Correlation Analyses

A correlation matrix was created to examine the relationships between the variables of interest (see Table 4). Threat and the log transformation of threat, in particular, had a number of significant positive relationships with other variables, including: threat and the log of threat (r = .97, $p < .01$); threat and check 2: "How far away do you view your upcoming medical procedure

(1 = very near, 10 = very far away)?" (r = .20, p < .01); threat and pain (r = .64, p < .01); threat and present fatalistic (r = .22, p < .01); and the log of threat and pain (r = .63, p < .01). Positive relationships were also observed between the log of threat and the log of check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring (in days)?" (r = .16, p < .05); the log of threat and check 2: "How far away do you view your upcoming medical procedure (1 = very near, 10 = very far away)?" (r = .18, p < .05); and the log of threat and present fatalistic (r = .16, p < .05). Therefore, the higher the threat, the greater the level of present fatalistic personality trait, pain, and distance in time an individual views their upcoming medical procedure.

The following variables similarly had positive relationships with other variables: Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring (in days)?" and the log of Check 1 (r = .77, p < .01); Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring (in days)?" and Check 2: "How far away do you view your upcoming medical procedure (1 = very near, 10 = very far away)?" (r = .39, p < .01); the log of Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring (in days)?" and Check 2: "How far away do you view your upcoming medical procedure (1 = very near, 10 = very far away)?" (r = .60, p < .01); and present hedonistic and present fatalistic (r = .33, p < .01). Furthermore, there were two positive relationships concerning pain, including: pain and Check 2: "How far away do you view your upcoming medical procedure (1 = very near, 10 = very far away)?" (r = .16, p < .05), and pain and present fatalistic (r = .18, p < .05). Finally, there were two significant negative relationships, both of which involved present fatalistic, including: present fatalistic and proactive

coping (r = -.15, p < .05), and present fatalistic and future (r = -.34, p < .01). In sum, individuals who are greater in present fatalistic are also greater in present hedonistic and pain, however they are lower in the "future" personality trait and lower on the dimension of proactive coping. In addition, as one sees their imagined medical procedure occurring further away on a spectrum (1 = very near, 10 = very far away), they also imagine it as occurring further away in days and the more pain they predict.

Reliability analyses were conducted for each of the scales: Proactive Coping Subscale of the Proactive Coping Inventory; Stress Appraisal Measure; and the Present Fatalistic, Present Hedonistic, and Future Subscales of the Zimbardo Time Perspective Inventory. These measures were found to have acceptable reliability ratings. The Chronbach alphas for these scales can be found in Table 3.

Manipulation Checks

Two kinds of manipulation checks were performed. First, t-tests were conducted on Checks 1 and 2 to examine overall differences between construal levels. Second, a series of multiple regressions were performed in order to determine whether there was a significant interaction between personality pertaining to time perspective and the experimental manipulation on Checks 1 and 2.

T-tests. In order to check on the overall effectiveness of the manipulation, two t-tests were performed on responses to two questions specifically designed for this purpose. In Check 1, participants were asked, "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Participants were asked to respond in terms of number of days. Check 2 asked, "How far away do you view your upcoming medical procedure? Please select the number that best describes your thoughts regarding your upcoming medical procedure on the scale (1 = very near, to 10 = very far away).

Results of the t-test on the log of Check 1 indicate that the t-test was significant using a one-tailed test. As expected, the mean for the high level construal condition was significantly higher than the mean for the low level construal condition (see Table 5). Results for Check 2 indicated that there was no significant difference between the mean responses in the two construal conditions using a one-tailed test, although the difference was in the expected direction. These results can also be found in Table 5.

Multiple regressions. As indicated earlier, multiple regressions were performed in order to determine whether personality (as measured on the three time perspective scales) interacted with the manipulations on Checks 1 and 2. These were: Present Fatalistic, Present Hedonistic, and Future. Thus, a total of six multiple regressions were performed with predictors being construal level, time perspective scale, and the interaction between construal level x time perspective scale for each check (see Tables 6 – 11). Only one analysis yielded a significant interaction between the manipulation and personality: construal level interacted significantly with Present Fatalistic (see Table 9). This interaction (see Figure 2) indicates that the manipulation was effective only for those high on the Present Fatalistic scale. That is, the high-level construal condition led to perceptions that the medical procedure was farther away than in the low-level construal condition, but only for those with high Present Fatalistic scores. Further multiple regressions were performed in order to determine whether there was a significant interaction between personality pertaining to time perception and the experimental manipulation in the manipulation where the dependent variable was threat.

IAT analyses. According to theory, the IAT measures response latencies to categorization of stimuli; it is assumed that if two concepts are more strongly associated in an individual's mind, they will respond faster when categorizing stimuli that are closely associated with a concept in their mind than to concepts that are weakly associated because the connections

are clearer due to repetition over time (Greenwald, McGhee, & Schwartz, 1998). The hypothesis relating to the IAT results in this study state that participants in the near-future (low-level construal) condition should be faster at associating "near-time" words with negative (threatening) words during the IAT—which measures the strength of association between the concepts of threat and time—than those in the distant-future (high-level construal) condition. In other words, participants in the near-future condition are expected to be faster at categorizing congruent pairings (near-time words with threatening words) than incongruent pairings (near-time words with non-threatening words) because the concepts are more closely associated due to the experimental manipulation. Participants in the distant-future condition are also expected to be faster at categorizing congruent pairings (distant-time words with non-threatening words) than incongruent pairings (distant-time words with threatening words).

For each participant, an IAT score in the form of a measure, termed *D*, a variant of Cohen's *d* (Greenwald, Nosek, & Banaji, 2003), was computed by calculating the difference between the mean response latencies for the two double-categorization test blocks (Blocks 5 and 9) within each participant's IAT and dividing that difference by its associated pooled standard deviation. The IAT *D* score was calculated such that better performance on a congruent block (near-time paired with threat and distant-time paired with non-threat) will result in a positive score, and an outcome that favours the incongruent block (near-time paired with non-threat and distant-time paired with threat) will result in a negative score.

Once the responses were removed due to 10% of response latencies being less than 300 milliseconds or greater than 10,000 milliseconds, the sample size totaled 180 participants. The participants demonstrated an overall implicit bias, $D = .17$, $SD = .56$, $t(179) = 4.05$, $p < .001$, in that they were faster to respond to the congruent trials, where near-time was paired with threat and distant-time with non-threat stimuli as compared to near-time with non-threat and distant-

time with threat (incongruent trials). However, neither the near-future group (D = .11, SD = .54) nor the distant-future group (D = .22, SD = .58) differed significantly in their speed of association of near-time with threat than near-time with non-threat concepts, $t(178) = -1.33$, p = .19, contrary to what was predicted (see Figure 11).

Testing the hypotheses. Hypothesis 1a states that participants in the near-future condition should indicate the stressful event as more threatening on the explicit Stress Appraisal Measure—which indicates the extent to which participants feel threatened due to their current situation—than those in the distant-future condition. Since earlier reported multiple regression results indicated a significant interaction between Present Fatalistic and construal level, three multiple regressions were performed with predictors being construal level, time perspective scale, and the interaction between construal level x time perspective scale (see Tables 12 – 14). These analyses allow for examination of main effects as well as interactions. The analyses indicated no significant main effects or interactions between the manipulation and personality when *threat* was the dependent variable.

Hypothesis 1b states that participants in the near-future condition should be faster at associating "near-time" words with negative (threatening) words during the Implicit Association Test—which measures the strength of association between the concepts of threat and time—than those in the distant-future condition. According to these results, this hypothesis was not supported, as performance was not significantly faster in one condition over the other. However, both groups still associated near-time with threat and distant-time with non-threat (congruent pairings) more often than near-time with non-threat and distant-time with threat (incongruent pairings) because their reaction times were faster with the congruent versus incongruent pairings. This suggests that threatening concepts are strongly associated with near-time concepts and non-threatening concepts are strongly associated with distant-time concepts in individuals' minds.

Evidently, when asked to pair two different concepts under the same response, it is easier to categorize stimuli when near-time is paired with threat and distant-time is paired with non-threat than to categorize stimuli when near-time is paired with non-threat and distant-time is paired with threat.

Hypothesis 2 states that proactive coping should moderate threat appraisals such that those who are higher in proactive coping should experience less threat in the near-future condition than those low in proactive coping. In order to test this hypothesis, multiple regressions were performed on each of the dependent variables: Check 1, Check 2, pain, and threat. However, since the experimental manipulation was shown to be effective only for those individuals high on the personality trait Present Fatalistic, this variable was also incorporated into the aforementioned regressions (see Tables 15 – 18). Table 18 demonstrates the results of a multiple regression in which predictors were temporal construal, Present Fatalistic, proactive coping, and their interactions with threat as the criterion. None of the predictors were significant. It is also noteworthy that 95% of the variance in threat was accounted for by other, unknown variables ($R^2 = .05$). See Figures 3 and 4 for a visual of the three-way interaction between temporal construal, proactive coping, and Present Fatalistic on threat.

Additional Analyses: Gender

Multiple regressions. Since gender is also an individual difference variable, it was additionally tested to see if it interacted with any of the independent variables to affect the dependent variable threat. In order to determine whether gender interacted with the temporal construal manipulation on the dependent variables Check 1, Check 2, threat, and pain, a series of four multiple regressions were performed. The predictors were thus construal level, gender, and the interaction between construal level x gender (see Tables 19-22). The only significant result observed was when gender significantly regressed onto pain (see Table 22). Further analyses

revealed that there was no significant difference on average pain rating between males and females, $t(190) = -1.40$, $p = .16$.

In addition, 12 multiple regressions were performed in order to determine whether gender also interacted with the personality traits Future, Present Fatalistic, and Present Hedonistic. Therefore, the predictors were gender; construal level; time perspective scale; the interaction between gender x construal level; the interaction between gender x time perspective scale; the interaction between construal level and time perspective scale; and the interaction between gender x construal level x time perspective scale (see Tables 23-34). The results yielded no significant interactions between gender, temporal construal, and personality.

Finally, four regressions were performed to determine whether there was an interaction between gender, temporal construal, and proactive coping on the dependent variables Check 1, Check 2, threat, and pain (see Tables 35-38). The predictors were therefore gender; temporal construal; proactive coping; the two-way interactions gender x temporal construal; gender x proactive coping; temporal construal x proactive coping; and the three-way interaction gender x temporal construal x proactive coping. An interesting result emerged, where gender, temporal construal, and proactive coping were found to significantly interact (see Table 37). Figure 5 shows that males who are high in proactive coping were significantly less threatened in the low-level construal condition than males in the low-level construal condition who are low in proactive coping. The opposite is true for females: Figure 6 shows that those females who are high in proactive coping and in the high-level construal condition were significantly less threatened than females who were low in proactive coping in the high-level construal condition. These results suggest that proactive coping plays a crucial role in the amount of threat males and females uniquely experience when placed in a stressful situation; with both genders, proactive

coping was seen to be beneficial (albeit in different conditions) in that those with high levels of proactive coping experienced less threat due to the stressful medical procedure.

To summarize, results reported here both supported and contradicted the predictions. The first hypothesis tested was that participants in the near-future condition should indicate that they feel more threatened by the imagined medical procedure than those in the distant-future condition. It was further hypothesized that proactive coping should act as a buffer and moderate threat appraisals, where those in the near-future condition who are higher in proactive coping should indicate on the self-report measure that they feel less threatened by the medical procedure than those in the near-future condition who are lower in proactive coping. These predictions were not supported. A noteworthy result was obtained, however, when a significant interaction was found between a personality trait from Zimbardo's Time Perspective Inventory and the experimental manipulation: it was discovered that the personality trait "present fatalistic" significantly interacted with temporal construal on the dependent variable Check 2: "How far away do you view your upcoming medical procedure (1 = very near, 10 = very far away)?" Those individuals who were high on the personality trait present fatalistic view their medical procedure as occurring farther away in the future in the high-level construal (distant-future) condition than those who were in the low-level construal condition. Thus, "trait" construal (present fatalistic personality trait) interacted with "state" construal (the manipulation), when participants rated how far away they viewed their upcoming medical procedure. The fact that the manipulation interacted with personality may have contributed to the lack of overall differences due to the manipulation.

A similar prediction was also tested, but using an implicit measure: the IAT. It was hypothesized that participants in the near-future condition would be faster at categorizing stimuli when the concepts "threat" and "near-time" were paired together than participants in the distant-

future condition. This was thought to be because participants in the near-future condition should associate the concepts of threat and near-time more strongly than participants in the distant-future condition due to the experimental manipulation, which was thought to evoke more threat in the near-future condition. This is because, according to temporal construal theory, focusing on the concrete details of an event should make the event seem closer in time. Thus, if the event is stressful (such as the medical procedure described in the experiment) and closer in time, individuals should feel more threatened by it. This was not the case, however, as there were no significant differences between the response latencies of the near-future and distant-future conditions. Nevertheless, participants in both conditions were faster at categorizing stimuli when the concepts of threat and distance were paired congruently (when near-time and threat were paired together and distant-time and non-threat were paired together) versus when these concepts were in incongruent pairings (when near-time and non-threat were paired together and distant-time and threat were paired together). This indicates that individuals, regardless of condition, more strongly associate near-time with threat and distant-time with non-threat than they associate near-time with non-threat and distant-time with threat, which is an unexpected but interesting finding.

Furthermore, significant differences were found between males and females regarding anticipated pain and threat appraisal. Females were discovered to anticipate the pain due to the stressful medical procedure as greater than males. Moreover, gender, temporal construal, and proactive coping were found to interact; males who tended to be higher in proactive coping were significantly less threatened in the low-level condition than those who are lower in proactive coping, whereas females who are higher in proactive coping were found to be less threatened in the high-level construal condition than those lower in proactive coping in this same condition.

Chapter 4: Discussion

The results of this study have contributed to a greater understanding of variables that have the potential to alleviate the effects of stress by investigating the relationship between threat, temporal construal, and coping. Although the primary hypotheses were not supported, it was discovered that personality traits can exert substantial influence on state manipulations; in the current study, a Present Fatalistic orientation—that is, a helpless and hopeless attitude toward the future and life in general—interacted with the temporal construal manipulation. These results confirm the expectation that an individual's time perspective orientation might interact with the time construal manipulation in this study. There was some evidence of the effectiveness of the manipulation as shown in Check 1. That is, participants in the high-level construal condition perceived the medical procedure as significantly farther away in terms of days than their low-level construal counterparts. Responses to Check 2 and with threat were not significantly different between the two construal conditions.

The present study also did not find support for the hypothesis that proactive coping as a moderator, significantly reduced threat appraisal in that those in the near-future condition who are high in proactive coping were not significantly less threatened by the stressful medical procedure than those in the near-future condition who were lower in proactive coping. However, contrary to these results, Cohen and Wills (1985) found that seeking social support—a method of coping—significantly buffered individuals from the harmful effects of a stressful situation in some instances. Furthermore, Parkes (1986) discovered that individual differences such as extraversion and neuroticism, and environmental and situational factors were significant predictors of general coping, direct coping, and suppression. These results highlight the importance of individual factors and environmental variables in stress and coping processes, which supports the notion that traits do in fact influence states.

The results of this study point to the importance of including individual differences in time perception when examining the effects of temporal construal. As pointed out by Zimbardo (Zimbardo & Boyd, 1999), there are differences among people in how they perceive time and his scales allow examination and quantification of these perceptions. Further support for the notion that individual differences influence time perception comes from a study by Wittmann and Paulus (2008). They purport that impulsive individuals experience time differently than those who are non-impulsive in that generally, the time until a beneficial outcome is received is viewed as a cost and is weighed against the benefits of the outcome. However, impulsive individuals view time at a higher cost; they overestimate the duration of time intervals and therefore discount the value of delayed rewards more strongly than do self-controlled individuals. Concepts of time perception and impulsivity could provide a strong foundation for future research as findings may be able to better associate impulsivity and an altered sense of time.

In this study, individual differences in three different time perspectives were included and their interaction with the temporal construal manipulation were examined on various responses. There was a significant interaction between a Present Fatalistic orientation and temporal construal on how far away people saw the procedure. Further examination of this interaction showed that high-level construal led to perceptions of seeing the procedure as farther away than low-level construal, but only in individuals who believed in fate- that is, people who perceived events as due to fate more so than their own efforts. One explanation for this finding is that individuals who see themselves as relatively helpless are more influenced by situational factors relating to time perception and thus more vulnerable to environmental cues than those who are less likely to see their destiny influenced by fate. This is due to a heuristic that has evolved from an individual's interaction with environmental stimuli and exposure to social situations over their lives (Zimbardo & Boyd, 1999). Thus, it is suggested that people who see themselves as more in

control of what happens to them are less vulnerable to manipulations of their time perspective. In a sense, because they are more inner directed, they are less sensitive to priming by environmental factors. This is an interesting hypothesis that could be pursued in future research. This idea of individuals in control being less vulnerable to outside influences can also be extended to a health context. Research has found that poorer self-control in males and females with Type A personalities is associated with high levels of day-to-day stress relative to Type As with better self-control (Heilbrun & Friedberg, 1988). These individuals may be more at risk than Type Bs for cardiovascular disease because they are more vulnerable to stress.

Limitations

The evidence presented here indicates that the manipulation was weak in that it did not have the intended effect on Check 2 or on threat perceptions. One reason for this may be that the hypothetical medical procedure that participants read about may not have seemed very threatening. That is, as individuals are removed from the situation, they may have difficulty imagining themselves having the procedure in the directed concrete or abstract terms. Perhaps the manipulations would have been more effective by making the procedure more graphic with the use of pictures or creating a more interactive, threat-inducing situation such as a video, for example. Another possibility is that since the participants responded to the proactive coping scale prior to the manipulation, this may have primed participants to be more proactive than usual, thus diminishing any differences that might have been observed due to the manipulation.

Future Research Directions

One individual variable not emphasized in the present experiment was gender. There is evidence that males and females differ on their perception of time estimation. Research by Espinosa-Fernandez and colleagues (2003) found gender differences in the performance of an empty interval production task. This task involved subjects estimating time intervals of 10

seconds, one minute, and five minutes while seated in an empty room with no temporal cues and pressing a button on a chronometer when they predicted that time was up. Results found that there was a greater underproduction of the longer intervals (one and five minutes) for females (the production method means that no activity was undertaken during the interval of the estimate). According to the researchers, this finding is due to different models of time estimation for males and females. This varied perception in time can carry over into the realm of temporal construal, and was in fact demonstrated in the current study through the interaction between gender, temporal construal, and proactive coping on threat. It is therefore important to investigate gender in depth in future studies and particularly its relation to temporal construal, proactive coping, and threat.

In the present study, a novel implicit measure of threat was developed by adapting the Implicit Association Test (IAT) to measure threat appraisal. The findings did not support the hypothesis that individuals in the near-future condition would be faster at categorizing stimuli when near-time and threatening concepts were paired together versus individuals in the distant-future condition due to their stronger anticipated association between near-time and threat. Consistent with these results, there has been skepticism among some researchers regarding the use of the IAT to identify biases according to response latencies when categorizing stimuli. Blanton and Jaccard (2006) exclaim that the IAT is an example of a test that is characterized by "metric arbitrariness", when it is not known where a given score locates an individual on an underlying psychological dimension. They purport that the IAT provides indirect assessment of psychological constructs, but that this measure does not provide sufficient information to test psychological theories.

However, the IAT tested in the present study has been shown to be successful in that it significantly identified that individuals have stronger associations between threat and near-time

concepts, as well as non-threat and distant-time concepts (congruent pairings) than threat and distant-time concepts, and non-threat and near-time concepts (incongruent pairings). The present adaptation was based on the design employed by Bar-Anan, Liberman, and Trope (2006) that measured the association between construal level and distance. Thus, it was a successful adaption to the study of psychological distance and threat, which was the focus of the present study. Moreover, future research could modify and adapt this design to the study of temporal construal in relation to other variables such as optimism, hope, and efficacy. It is important to determine the effect of temporal construal on threat both implicitly (through the IAT) and explicitly (through self-report or other measures) because people may hold implicit views that they are unaware of regarding threat and psychological distance, which may not be revealed through explicit measures alone.

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Table 1

Demographic Characteristics of the Total Sample (N = 195)

	n	%
Gender		
Male	83	43.20
Female	109	56.80
Age		
17-20	95	49.70
21-30	82	42.90
31 and older	14	7.30
Year of Study		
First year undergraduate	63	32.60
Second year undergraduate	51	26.40
Third year undergraduate	40	20.70
Fourth year undergraduate	30	15.50
Fifth year undergraduate	5	2.60
Graduate student	4	2.10
Faculty		
Arts, Media, Performance, & Design	3	2.30
Education	1	0.80
Environmental Studies	3	2.30
Health	50	38.50
Engineering	3	2.30
Liberal Arts & Professional Studies	48	36.90
Business	1	0.80
Science	19	14.60
Other	2	1.50
Native English		
No	77	40.10
Yes	115	59.90
Medical Condition (Yes)		
Diabetes	3	1.50
Severe allergies	7	3.60
Neurological conditions	3	1.50
Respiratory conditions	9	4.60
Cancer	3	1.50
Heart disease	1	0.50
Physical or sensory disability	7	3.60

Table 2

IAT Stimuli for Low-Level Construal and High-Level Construal Conditions

Psychological Distance		Threat	
Near Time	Distant Time	Threatening (Negative)	Non-Threatening (Positive)
A second	A year	Timid	Marvelous
A minute	A decade	Submissive	Superb
Now	Later	Fragile	Pleasure
Immediately	Last year	Follow	Beautiful
Soon	A while	Fail	Joyful
Shortly	A century	Obey	Glorious
Before long	Eventually	Hesitant	Lovely
Promptly	Remote	Uncertain	Wonderful

Table 3

Descriptive and Reliability Statistics On Each Variable Of Interest For The Total Sample

Variable	α	M	SD	N	Range
Temporal Construal	-	1.55	.50	195	1
Proactive Coping	.83	44.05	5.42	189	30
Threat	.80	1.81	.78	195	4
Log of Threat	-	.22	.17	195	1
Check 1	-	32.78	77.53	193	365
Log of Check 1	-	.86	.70	190	3
Check 2	-	5.08	3.02	195	9
Pain	-	2.26	1.05	195	4
Present Fatalistic	.72	2.62	.61	190	4
Present Hedonistic	.77	3.44	.50	189	3
Future	.79	3.62	.55	188	3

Table 4

Pearson Correlations of Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Temporal Construal											
2. Proactive Coping	-.02										
3. Threat	.03	-.10									
4. Log of Threat	.05	-.13	.97**								
5. Check 1	.08	.06	-.01	-.01							
6. Log of Check 1	.13	.04	.13	.16*	.77**						
7. Check 2	.05	.00	.20**	.18*	.39**	.60**					
8. Pain	-.00	-.05	.64**	.63**	.06	.14	.16*				
9. Present Fatalistic	.04	-.15*	.22**	.16*	-.04	.02	.13	.18*			
10. Present Hedonistic	-.04	.14	.09	.06	-.06	.01	.07	-.05	.33**		
11. Future	.06	.06	-.04	-.01	.02	.03	.04	-.03	-.34**	.01	

Note. *$p < .05$, **$p < .01$ (2-tailed).

Table 5

*Means for Check 1# by Low-Level Construal (*N = *88) and High-Level Construal (*N = 102*) and Means for Check 2*† *by Low-Level Construal (*N = *88) and High-Level Construal (*N = *107)*

Variable	Low-Level Construal	High-Level Construal	*t*	*df*
Check 1	.76 (.68)	.94 (.71)	-1.81*	188
Check 2	4.92 (3.09)	5.21 (2.97)	-.68	193

Note. **p* < .05 (one tailed test). Standard Deviations appear in parentheses below means. #Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days). †Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 6

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, and Construal Level × Present Fatalistic; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	-.28	.47	-.20	-.59	.56
Present Fatalistic	-.24	.27	-.21	-.89	.37
Temporal Construal × Present Fatalistic	.18	.18	.41	1.02	.31
$R^2 = .02$					

Note. $F = 1.51$, $df = 3/184$, $p = .21$. Predictors accounted for 2% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 7

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Hedonistic, and Construal Level × Present Hedonistic; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	-.18	.70	-.13	-.25	.80
Present Hedonistic	-.12	.32	-.09	-.37	.71
Temporal Construal × Present Hedonistic	.10	.20	.26	.47	.64
$R^2 = .01$					

Note. $F = .81$, $df = 3/184$, $p = .49$. Predictors accounted for 1% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 8

Summary of Hierarchical Regression Analysis for Temporal Construal, Future, and Construal Level × Future; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	.56	.67	.41	.84	.40
Future	.19	.29	.16	.67	.51
Temporal Construal × Future	-.11	.18	-.34	-.62	.54
R^2 = .02					

Note. F = .93, df = 3/182, p = .43. Predictors accounted for 2% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 9

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, and Construal Level × Present Fatalistic; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	-3.69	1.90	-.61	-1.94	.05
Present Fatalistic	-1.69	1.14	-.34	-1.48	.14
Temporal Construal × Present Fatalistic	1.51	.71	.84	2.14*	.03
$R^2 = .04$					

Note. *$p < .05$. The model was significant ($F = 2.77$, $df = 3/189$, $p = .04$). Predictors accounted for 4% of the variance in Check 2. #Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 10

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Hedonistic, and Construal Level × Present Hedonistic; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	-1.98	3.02	-.33	-.66	.51
Present Hedonistic	-.56	1.38	-.09	-.40	.69
Temporal Construal × Present Hedonistic	.65	.87	.41	.75	.45
R^2 = .01					

Note. F = .63, df = 3/188, p = .60. Predictors accounted for 1% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 11

Summary of Hierarchical Regression Analysis for Temporal Construal, Future, and Construal Level × Future; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	1.97	2.90	.33	.68	.50
Future	.92	1.25	.17	.73	.46
Temporal Construal × Future	-.47	.79	-.33	-.59	.55
R^2 = .01					

Note. F = .35, df = 3/187, p = .79. Predictors accounted for 1% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 12

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, and Construal Level × Present Fatalistic; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	.00	.11	.01	.04	.97
Present Fatalistic	.03	.06	.12	.53	.60
Temporal Construal × Present Fatalistic	.01	.04	.07	.17	.87
$R^2 = .03$					

Note. $F = 1.95$, $df = 3/189$, $p = .12$. Predictors accounted for 3% of the variance in threat.

Table 13

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Hedonistic, and Construal Level × Present Hedonistic; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	.00	.17	.01	.03	.98
Present Hedonistic	.02	.08	.05	.20	.85
Temporal Construal × Present Hedonistic	.00	.05	.05	.09	.93
R^2 = .01					

Note. F = .45, df = 3/188, p = .72. Predictors accounted for 1% of the variance in threat.

Table 14

Summary of Hierarchical Regression Analysis for Temporal Construal, Future, and Construal Level × Future; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	.05	.16	.14	.29	.77
Future	.01	.07	.02	.07	.95
Temporal Construal × Future	-.01	.05	-.07	-.13	.89
R^2 = .01					

Note. F = .39, df = 3/187, p = .76. Predictors accounted for 1% of the variance in threat.

Table 15

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, Proactive Coping, Construal Level × Present Fatalistic, Construal Level x Proactive Coping, Present Fatalistic x Proactive Coping, and Construal Level × Present Fatalistic × Proactive Coping; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	.10	4.08	.07	.03	.98
Present Fatalistic	.54	2.42	.45	.22	.82
Proactive Coping	.05	.15	.38	.33	.74
Temporal Construal × Present Fatalistic	.03	1.45	.06	.02	.99
Temporal Construal x Proactive Coping	-.01	.09	-.18	-.06	.96
Present Fatalistic x Proactive Coping	-.02	.05	-.63	-.30	.77
Temporal Construal × Present Fatalistic × Proactive Coping	.00	.03	.23	.07	.95
R^2 = .03					

Note. F = .72, df = 7/172, p = .66. Predictors accounted for 3% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 16

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, Proactive Coping, Construal Level × Present Fatalistic, Construal Level x Proactive Coping, Present Fatalistic x Proactive Coping, and Construal Level × Present Fatalistic × Proactive Coping; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	1.16	17.18	.19	.07	.95
Present Fatalistic	.42	10.31	.08	.04	.97
Proactive Coping	.11	.65	.20	.18	.86
Temporal Construal × Present Fatalistic	-.61	6.12	-.32	-.10	.92
Temporal Construal x Proactive Coping	-.11	.38	-.87	-.29	.77
Present Fatalistic x Proactive Coping	-.05	.23	-.41	-.19	.85
Temporal Construal × Present Fatalistic × Proactive Coping	.05	.14	1.16	.35	.73
R^2 = .04					

Note. F = 1.09, df = 7/176, p = .37. Predictors accounted for 4% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 17

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, Proactive Coping, Construal Level × Present Fatalistic, Construal Level x Proactive Coping, Present Fatalistic x Proactive Coping, and Construal Level × Present Fatalistic × Proactive Coping; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	1.78	5.85	.87	.30	.76
Present Fatalistic	.38	3.51	.21	.11	.92
Proactive Coping	-.03	.22	-.13	-.11	.91
Temporal Construal × Present Fatalistic	-.74	2.08	-1.15	-.36	.72
Temporal Construal x Proactive Coping	-.03	.13	-.74	-.25	.81
Present Fatalistic x Proactive Coping	.00	.08	.07	.04	.97
Temporal Construal × Present Fatalistic × Proactive Coping	.01	.05	.98	.29	.77
R^2 = .04					

Note. F = 1.12, df = 7/176, p = .35. Predictors accounted for 4% of the variance in pain.

Table 18

Summary of Hierarchical Regression Analysis for Temporal Construal, Present Fatalistic, Proactive Coping, Construal Level × Present Fatalistic, Construal Level x Proactive Coping, Present Fatalistic x Proactive Coping, and Construal Level × Present Fatalistic × Proactive Coping; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Temporal Construal	1.34	.95	4.02	1.42	.16
Present Fatalistic	.87	.57	3.05	1.53	.13
Proactive Coping	.05	.04	1.62	1.40	.16
Temporal Construal × Present Fatalistic	-.45	.34	-4.28	-1.32	.19
Temporal Construal x Proactive Coping	-.03	.02	-4.09	-1.36	.18
Present Fatalistic x Proactive Coping	-.02	.01	-3.03	-1.44	.15
Temporal Construal × Present Fatalistic × Proactive Coping	.01	.01	4.23	1.28	.20
R^2 = .05					

Note. F = 1.28, df = 7/176, p = .26. Predictors accounted for 5% of the variance in threat.

Table 19

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, and Gender × Construal Level; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.14	.33	.10	.42	.68
Temporal Construal	.47	.34	.34	1.39	.17
Gender × Temporal Construal	-.17	.20	-.27	-.85	.40
R^2 = .03					

Note. F = 2.15, df = 3/183, p = .10. Predictors accounted for 3% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 20

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, and Gender × Construal Level; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.55	1.43	.09	.38	.70
Temporal Construal	1.59	1.45	.27	1.10	.27
Gender × Temporal Construal	-.83	.88	-.30	-.94	.35
R^2 = .02					

Note. F = 1.46, df = 3/188, p = .23. Predictors accounted for 2% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 21

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, and Gender × Construal Level; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.07	.08	.20	.83	.41
Temporal Construal	.06	.08	.18	.72	.47
Gender × Temporal Construal	-.02	.05	-.15	-.46	.65
R^2 = .01					

Note. F = .88, df = 3/188, p = .45. Predictors accounted for 1% of the variance in threat.

Table 22

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, and Gender × Construal Level; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	1.04	.50	.49	2.08	.04
Temporal Construal	.87	.51	.42	1.73	.09
Gender × Temporal Construal	-.53	.31	-.55	-1.73	.09
R^2 = .03					

Note. F = 1.68, df = 3/188, p = .17. Predictors accounted for 3% of the variance in pain.

Table 23

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Future, Gender × Construal Level, Gender × Future, Construal Level × Future, and Gender × Construal Level × Future; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	2.85	2.09	2.09	1.36	.18
Temporal Construal	3.54	2.20	2.62	1.61	.11
Future	1.35	.95	1.11	.142	.16
Gender × Temporal Construal	-1.92	1.34	-3.11	-1.43	.16
Gender × Future	-.76	.58	-2.27	-1.31	.19
Temporal Construal × Future	-.87	.61	-2.64	-1.44	.15
Gender × Temporal Construal × Future	.49	.37	3.10	1.33	.18
R^2 = .04					

Note. F = .96, df = 7/174, p = .47. Predictors accounted for 4% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 24

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Future, Gender × Construal Level, Gender × Future, Construal Level × Future, and Gender × Construal Level × Future; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-2.10	9.19	-.35	-.23	.82
Temporal Construal	-.75	9.60	-.13	-.08	.94
Future	-.23	4.18	-.04	-.05	.96
Gender × Temporal Construal	1.67	5.86	.61	.29	.78
Gender × Future	.69	2.53	.47	.27	.79
Temporal Construal × Future	.56	2.64	.39	.21	.83
Gender × Temporal Construal × Future	-.63	1.6	-.91	-.40	.69
R^2 = .02					

Note. F = .53, df = 7/179, p = .81. Predictors accounted for 2% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 25

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Future, Gender × Construal Level, Gender × Future, Construal Level × Future, and Gender × Construal Level × Future; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-.08	.52	-.25	-.16	.87
Temporal Construal	.14	.54	.42	.26	.80
Future	-.07	.24	-.22	-.29	.77
Gender × Temporal Construal	-.07	.33	-.42	-.20	.84
Gender × Future	.04	.14	.51	.29	.77
Temporal Construal × Future	-.02	.15	-.25	-.14	.89
Gender × Temporal Construal × Future	.01	.09	.30	.13	.90
R^2 = .03					

Note. F = .69, df = 7/179, p = .68. Predictors accounted for 3% of the variance in threat.

Table 26

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Future, Gender × Construal Level, Gender × Future, Construal Level × Future, and Gender × Construal Level × Future; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	2.84	3.22	1.35	.88	.38
Temporal Construal	2.25	3.36	1.08	.67	.50
Future	.78	1.46	.41	.53	.59
Gender × Temporal Construal	-1.32	2.05	-1.38	-.64	.52
Gender × Future	-.51	.89	-1.00	-.58	.57
Temporal Construal × Future	-.40	.92	-.78	-.43	.67
Gender × Temporal Construal × Future	.23	.56	.94	.41	.68
$R^2 = .03$					

Note. $F = .82$, $df = 7/179$, $p = .57$. Predictors accounted for 3% of the variance in pain.

Table 27

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Fatalistic, Gender × Construal Level, Gender × Present Fatalistic, Construal Level × Present Fatalistic, and Gender × Construal Level × Present Fatalistic; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.80	1.49	.57	.53	.59
Temporal Construal	.69	1.56	.50	.44	.66
Present Fatalistic	.26	.94	.22	.28	.78
Gender × Temporal Construal	-.52	.94	-.82	-.55	.59
Gender × Present Fatalistic	-.26	.56	-.61	-.47	.64
Temporal Construal × Present Fatalistic	-.09	.59	-.21	-.16	.88
Gender × Temporal Construal × Present Fatalistic	.14	.35	.64	.39	.70
$R^2 = .04$					

Note. $F = 1.08$, $df = 7/176$, $p = .38$. Predictors accounted for 4% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 28

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Fatalistic, Gender × Construal Level, Gender × Present Fatalistic, Construal Level × Present Fatalistic, and Gender × Construal Level × Present Fatalistic; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	4.80	6.28	.80	.76	.45
Temporal Construal	.71	6.32	.12	.11	.91
Present Fatalistic	1.54	3.94	.32	.39	.70
Gender × Temporal Construal	-2.32	3.88	-.84	-.60	.55
Gender × Present Fatalistic	-1.76	2.36	-.95	-.75	.46
Temporal Construal × Present Fatalistic	.12	2.35	-.95	-.75	.46
Gender × Temporal Construal × Present Fatalistic	..70	1.45	.74	.48	.63
$R^2 = .06$					

Note. $F = 1.67$, $df = 7/181$, $p = .12$. Predictors accounted for 6% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 29

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Fatalistic, Gender × Construal Level, Gender × Present Fatalistic, Construal Level × Present Fatalistic, and Gender × Construal Level × Present Fatalistic; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.18	.36	.54	.52	.61
Temporal Construal	.18	.36	.53	.50	.62
Present Fatalistic	.11	.22	.38	.47	.64
Gender × Temporal Construal	-.12	.22	-.79	-.56	.58
Gender × Present Fatalistic	-.05	.13	-.49	-.38	.70
Temporal Construal × Present Fatalistic	-.05	.13	-.51	-.39	.70
Gender × Temporal Construal × Present Fatalistic	.04	.08	.80	.52	.61
$R^2 = .04$					

Note. $F = 1.17$, $df = 7/181$, $p = .32$. Predictors accounted for 4% of the variance in threat.

Table 30

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Fatalistic, Gender × Construal Level, Gender × Present Fatalistic, Construal Level × Present Fatalistic, and Gender × Construal Level × Present Fatalistic; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-.81	2.16	-.39	-.37	.71
Temporal Construal	-.12	2.18	-.06	-.05	.96
Present Fatalistic	-.85	1.36	-.50	-.62	.53
Gender × Temporal Construal	.14	1.33	.14	.10	.92
Gender × Present Fatalistic	.73	.81	1.13	.90	.37
Temporal Construal × Present Fatalistic	.41	.81	.66	.51	.61
Gender × Temporal Construal × Present Fatalistic	-.26	.50	-.79	-.52	.60
R^2 = .08					

Note. F = 2.13, df = 7/181, p = .04. Predictors accounted for 8% of the variance in pain.

Table 31

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Hedonistic, Gender × Construal Level, Gender × Present Hedonistic, Construal Level × Present Hedonistic, and Gender × Construal Level × Present Hedonistic; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	1.67	2.25	1.23	.74	.46
Temporal Construal	2.32	2.38	1.72	.97	.33
Present Hedonistic	.70	1.07	.52	.65	.52
Gender × Temporal Construal	-1.45	1.43	-2.36	-1.01	.31
Gender × Present Hedonistic	-.46	.64	-1.29	-.72	.48
Temporal Construal × Present Hedonistic	-.57	.68	-1.58	-.83	.41
Gender × Temporal Construal × Present Hedonistic	.38	.41	2.22	.94	.35
$R^2 = .03$					

Note. $F = .83$, $df = 7/176$, $p = .56$. Predictors accounted for 3% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 32

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Hedonistic, Gender × Construal Level, Gender × Present Hedonistic, Construal Level × Present Hedonistic, and Gender × Construal Level × Present Hedonistic; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	3.07	9.83	.52	.31	.76
Temporal Construal	1.59	10.32	.27	.15	.88
Present Hedonistic	.76	4.69	.13	.16	.87
Gender × Temporal Construal	-1.83	6.18	-.68	-.30	.77
Gender × Present Hedonistic	-.66	2.82	-.42	-.23	.82
Temporal Construal × Present Hedonistic	.02	2.96	.01	.01	.10
Gender × Temporal Construal × Present Hedonistic	.28	1.78	.37	.16	.88
$R^2 = .03$					

Note. $F = .67$, $df = 7/180$, $p = .70$. Predictors accounted for 3% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 33

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Hedonistic, Gender × Construal Level, Gender × Present Hedonistic, Construal Level × Present Hedonistic, and Gender × Construal Level × Present Hedonistic; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-.01	.55	-.03	-.02	.99
Temporal Construal	-.18	.58	-.56	-.32	.75
Present Hedonistic	-.02	.26	-.05	-.06	.95
Gender × Temporal Construal	.10	.35	.69	.30	.76
Gender × Present Hedonistic	.01	.16	.15	.08	.93
Temporal Construal × Present Hedonistic	.06	.17	.68	.36	.72
Gender × Temporal Construal × Present Hedonistic	-.03	.10	-.72	-.31	.76
$R^2 = .02$					

Note. $F = .52$, $df = 7/180$, $p = .82$. Predictors accounted for 2% of the variance in threat.

Table 34

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Present Hedonistic, Gender × Construal Level, Gender × Present Hedonistic, Construal Level × Present Hedonistic, and Gender × Construal Level × Present Hedonistic; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-2.54	3.40	-1.23	-.75	.46
Temporal Construal	-1.97	3.57	-.96	-.55	.58
Present Hedonistic	-1.53	1.62	-.75	-.94	.35
Gender × Temporal Construal	1.46	2.14	1.56	.68	.50
Gender × Present Hedonistic	.99	.97	1.82	1.02	.31
Temporal Construal × Present Hedonistic	.77	1.02	1.40	.75	.45
Gender × Temporal Construal × Present Hedonistic	-.55	.61	-2.05	-.89	.38
$R^2 = .03$					

Note. $F = .81$, $df = 7/180$, $p = .58$. Predictors accounted for 3% of the variance in pain.

Table 35

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Proactive Coping, Gender × Construal Level, Gender × Proactive Coping, Construal Level × Proactive Coping, and Gender × Construal Level × Proactive Coping; Criterion: Check 1#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	.42	2.79	.30	.15	.88
Temporal Construal	.72	2.93	.52	.25	.81
Proactive Coping	.01	.10	.05	.06	.96
Gender × Temporal Construal	-.49	1.75	-.78	-.28	.78
Gender × Proactive Coping	-.01	.06	-.19	-.09	.93
Temporal Construal × Proactive Coping	-.01	.07	-.17	-.08	.94
Gender × Temporal Construal × Proactive Coping	.01	.04	.49	.17	.87
$R^2 = .04$					

Note. $F = .95$, $df = 7/174$, $p = .47$. Predictors accounted for 4% of the variance in Check 1.
#Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 36

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Proactive Coping, Gender × Construal Level, Gender × Proactive Coping, Construal Level × Proactive Coping, and Gender × Construal Level × Proactive Coping; Criterion: Check 2#

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-3.69	12.16	-.61	-.30	.76
Temporal Construal	-3.75	12.56	-.63	-.30	.77
Proactive Coping	-.17	.45	-.31	-.38	.70
Gender × Temporal Construal	2.18	7.53	.80	.29	.77
Gender × Proactive Coping	.10	.27	.79	.37	.71
Temporal Construal × Proactive Coping	.13	.28	.99	.44	.66
Gender × Temporal Construal × Proactive Coping	-.07	.17	-1.20	-.42	.67
R^2 = .02					

Note. F = .62, df = 7/178, p = .74. Predictors accounted for 2% of the variance in Check 2.
#Check 2: "How far away do you view your upcoming medical procedure?" Response: 1-10.

Table 37

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Proactive Coping, Gender × Construal Level, Gender × Proactive Coping, Construal Level × Proactive Coping, and Gender × Construal Level × Proactive Coping; Criterion: Threat

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-7.08	3.04	-4.61	-2.33	.02
Temporal Construal	-6.40	3.14	-4.20	-2.04	.04
Proactive Coping	-.28	.11	-1.20	-2.53	.01
Gender × Temporal Construal	3.97	1.88	5.75	2.11	.04
Gender × Proactive Coping	.17	.07	5.11	2.47	.02
Temporal Construal × Proactive Coping	.15	.07	4.63	2.13	.04
Gender × Temporal Construal × Proactive Coping	-.09	.04	-6.09	-2.19	.03
$R^2 = .06$					

Note. $F = 1.58$, $df = 7/178$, $p = .14$. Predictors accounted for 6% of the variance in threat.

Table 38

Summary of Hierarchical Regression Analysis for Gender, Temporal Construal, Proactive Coping, Gender × Construal Level, Gender × Proactive Coping, Construal Level × Proactive Coping, and Gender × Construal Level × Proactive Coping; Criterion: Pain

Variable	*B*	*SE B*	*β*	*t*	*Sig.*
Gender	-2.42	4.17	-1.16	-.58	.56
Temporal Construal	-2.07	4.31	-.10	-.48	.63
Proactive Coping	-.14	.15	-.74	-.92	.36
Gender × Temporal Construal	1.21	2.59	1.29	.47	.64
Gender × Proactive Coping	.08	.09	1.77	.85	.40
Temporal Construal × Proactive Coping	.07	.10	1.51	.69	.49
Gender × Temporal Construal × Proactive Coping	-.04	.06	-1.92	-.68	.50
$R^2 = .04$					

Note. $F = 1.05$, $df = 7/178$, $p = .40$. Predictors accounted for 4% of the variance in pain.

Table 39

Skewness and Standard Error for Check 1# before Log Transformation

Variable	Skewness	Standard Error
Check 1	3.39	.18

Note. Skewness/SE = 3.39/.18 = 18.83. #Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 40

Skewness and Standard Error for Check 1# after Log Transformation

Variable	Skewness	Standard Error
Check 1	.79	.18

Note. Skewness/SE = .79/.18 = 4.39. #Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" Response: (days).

Table 41

Skewness and Standard Error for Threat before Log Transformation

Variable	Skewness	Standard Error
Threat	1.44	.17

Note. Skewness/SE = 1.44/.17 = 8.47.

Table 42

Skewness and Standard Error for Threat after Log Transformation

Variable	Skewness	Standard Error
Threat	.49	.17

Note. Skewness/SE = .49/.17 = 2.88.

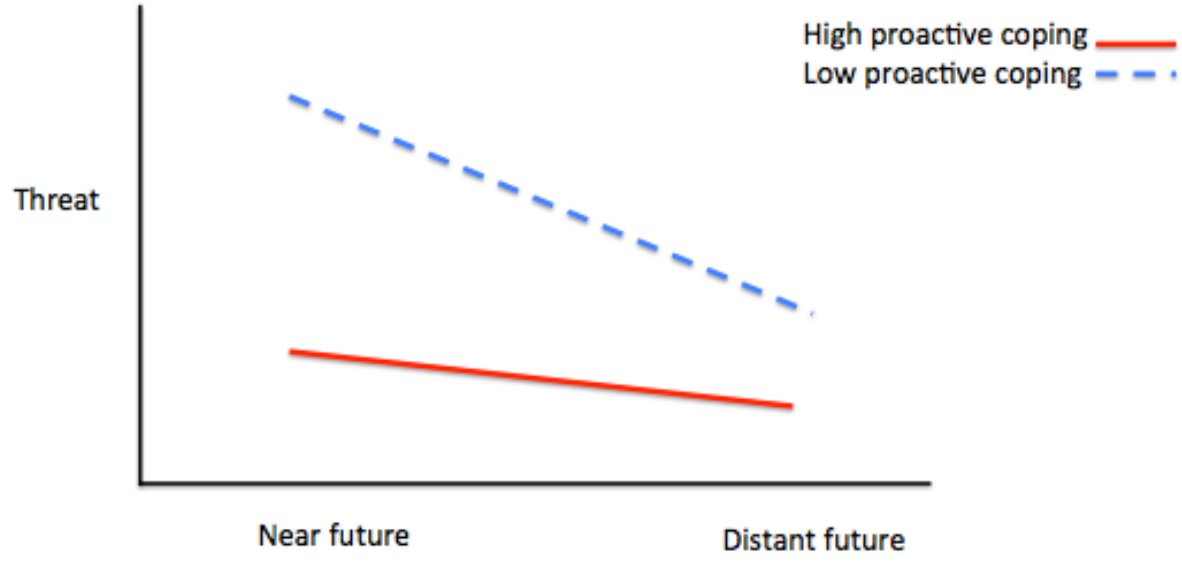

Figure 1. Predicted threat by temporal construal and proactive coping.

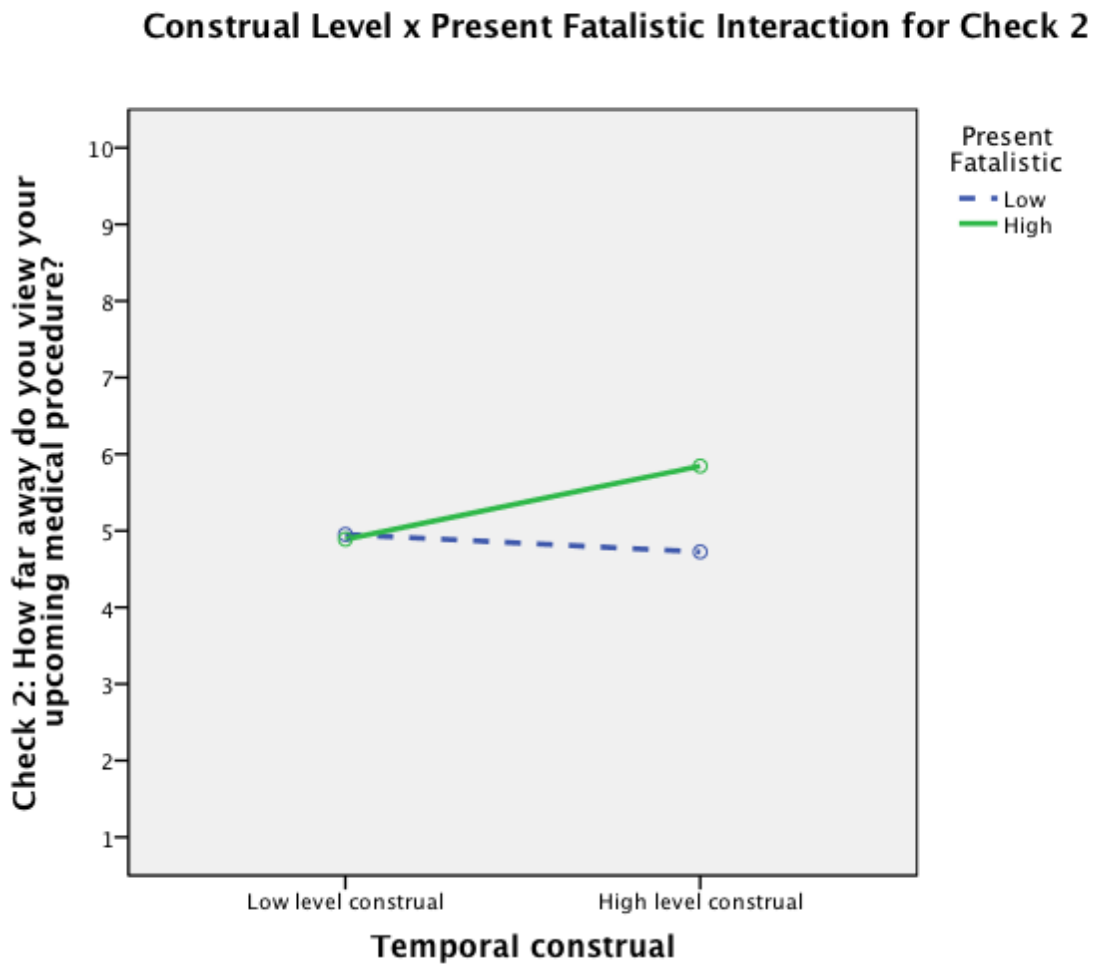

Figure 2. Interaction between construal level × present fatalistic for check 2: How far away do you view your upcoming medical procedure?

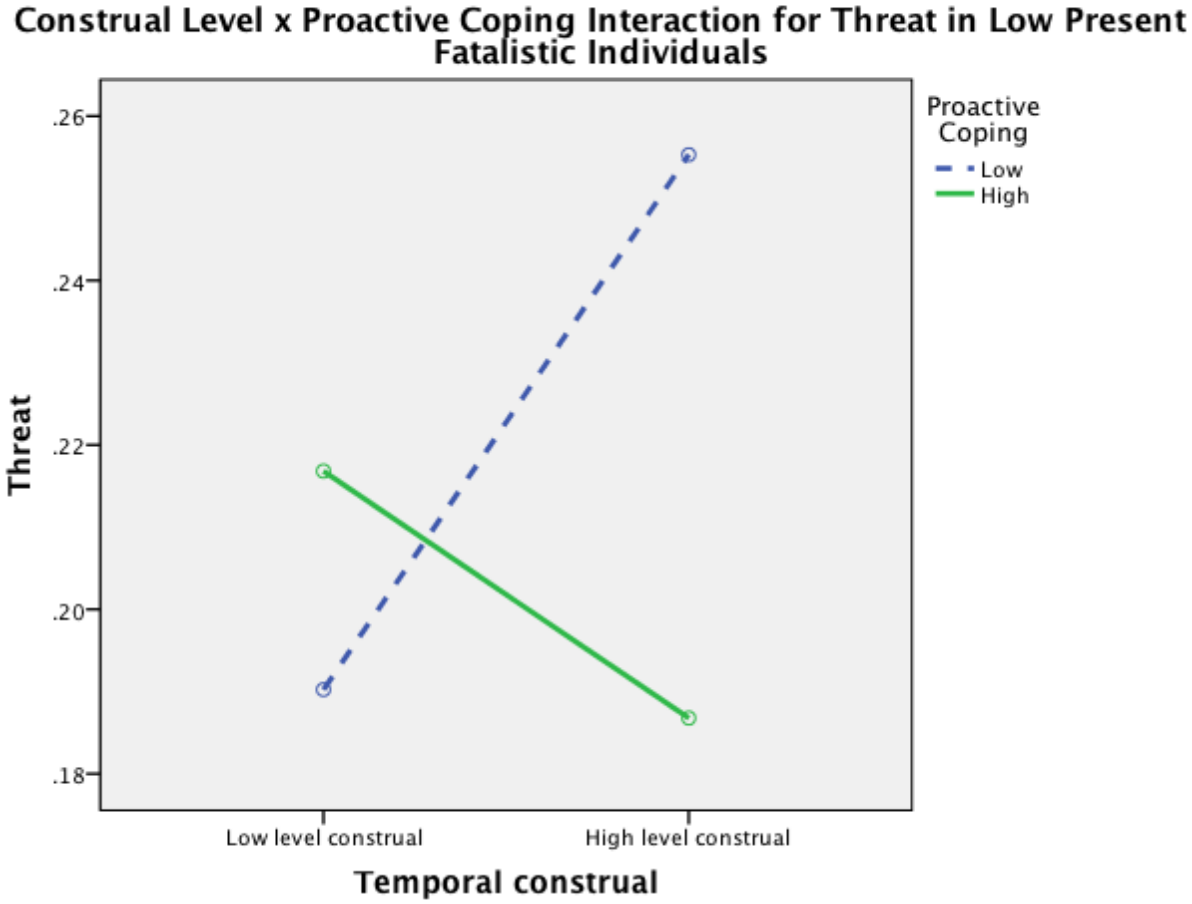

Figure 3. Interaction between construal level × proactive coping for threat in individuals low in present fatalistic trait.

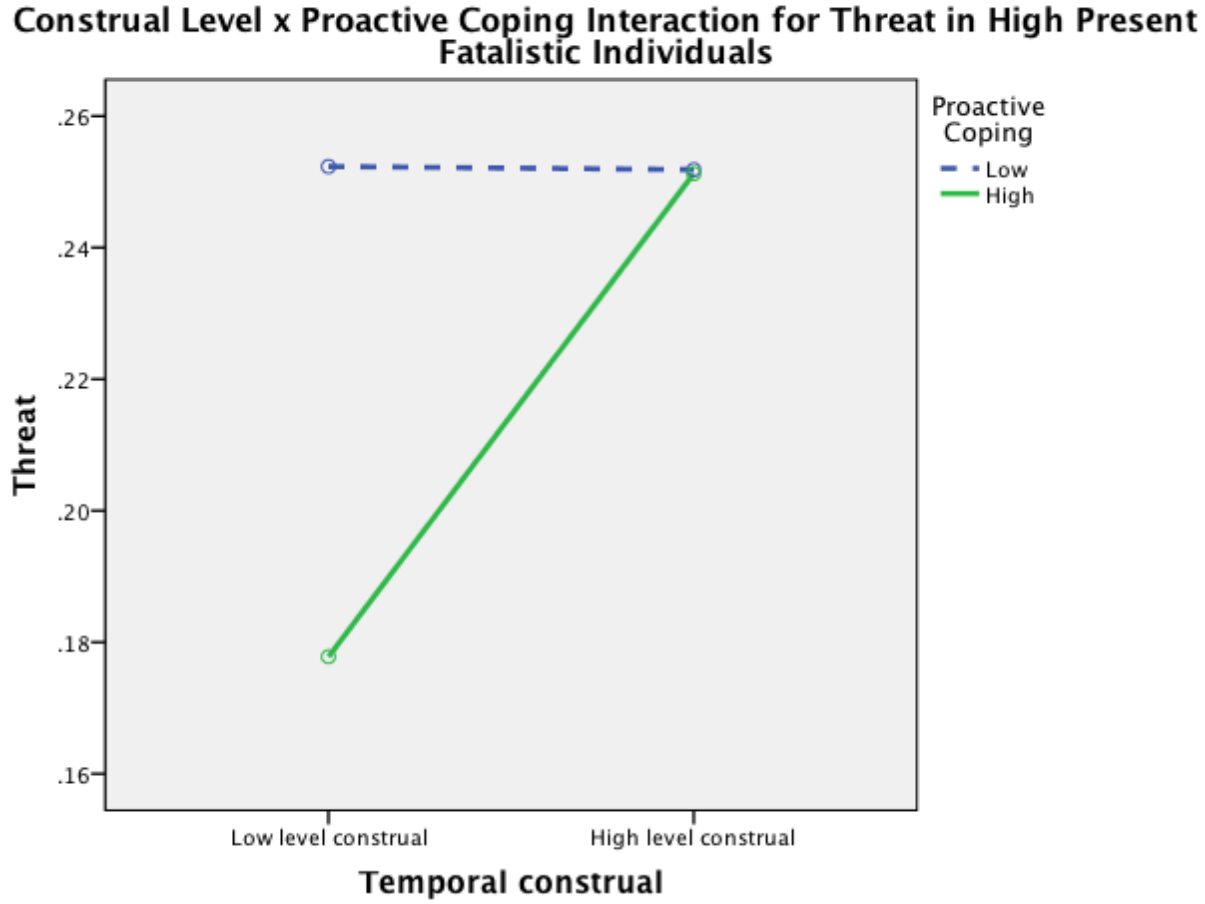

Figure 4. Interaction between construal level × proactive coping for threat in individuals high in present fatalistic trait.

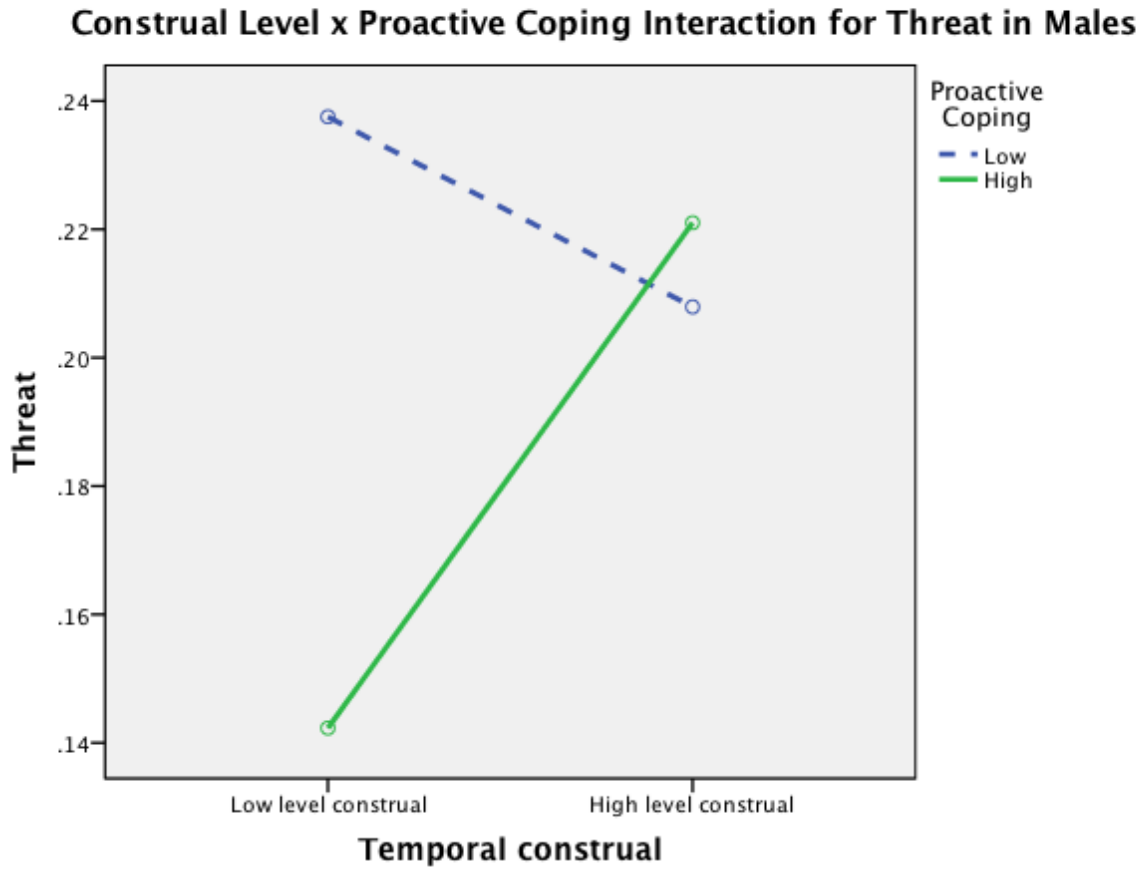

Figure 5. Interaction between construal level × proactive coping for males.

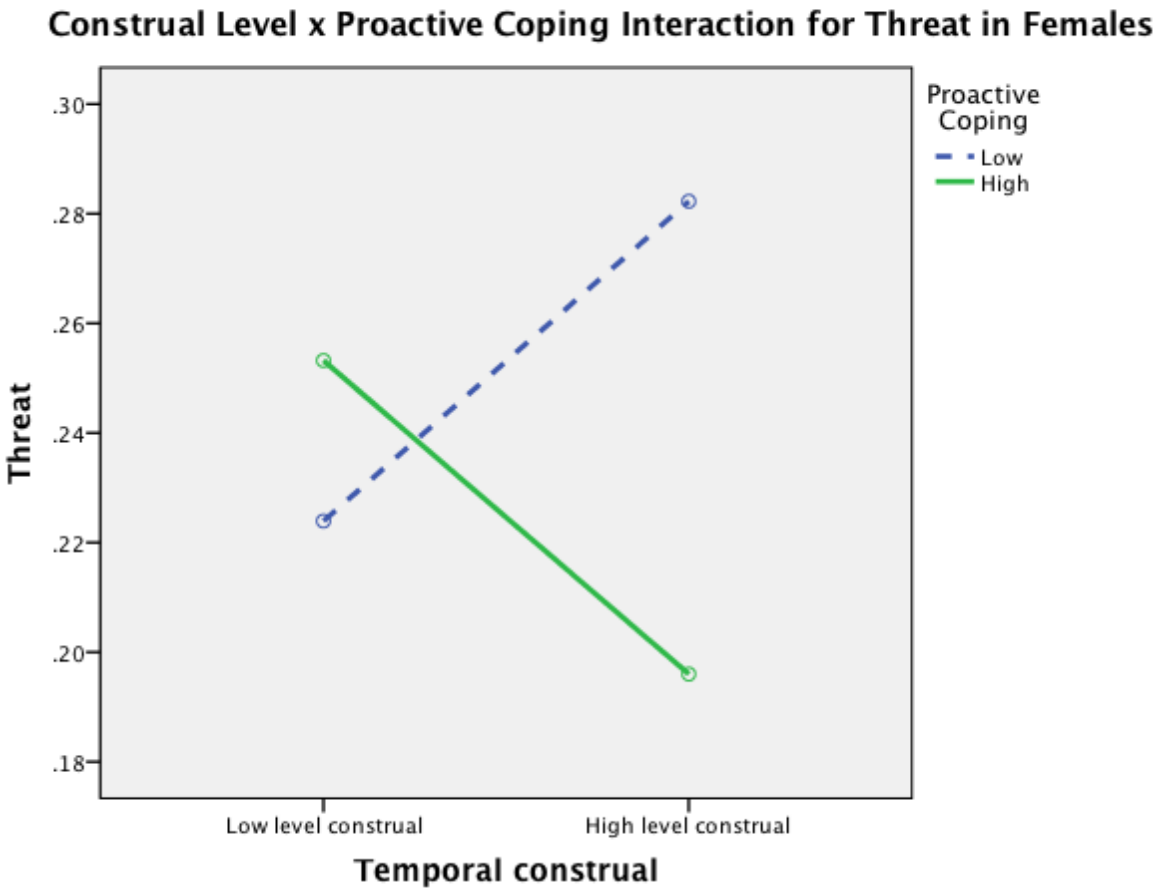

Figure 6. Interaction between construal level × proactive coping for females.

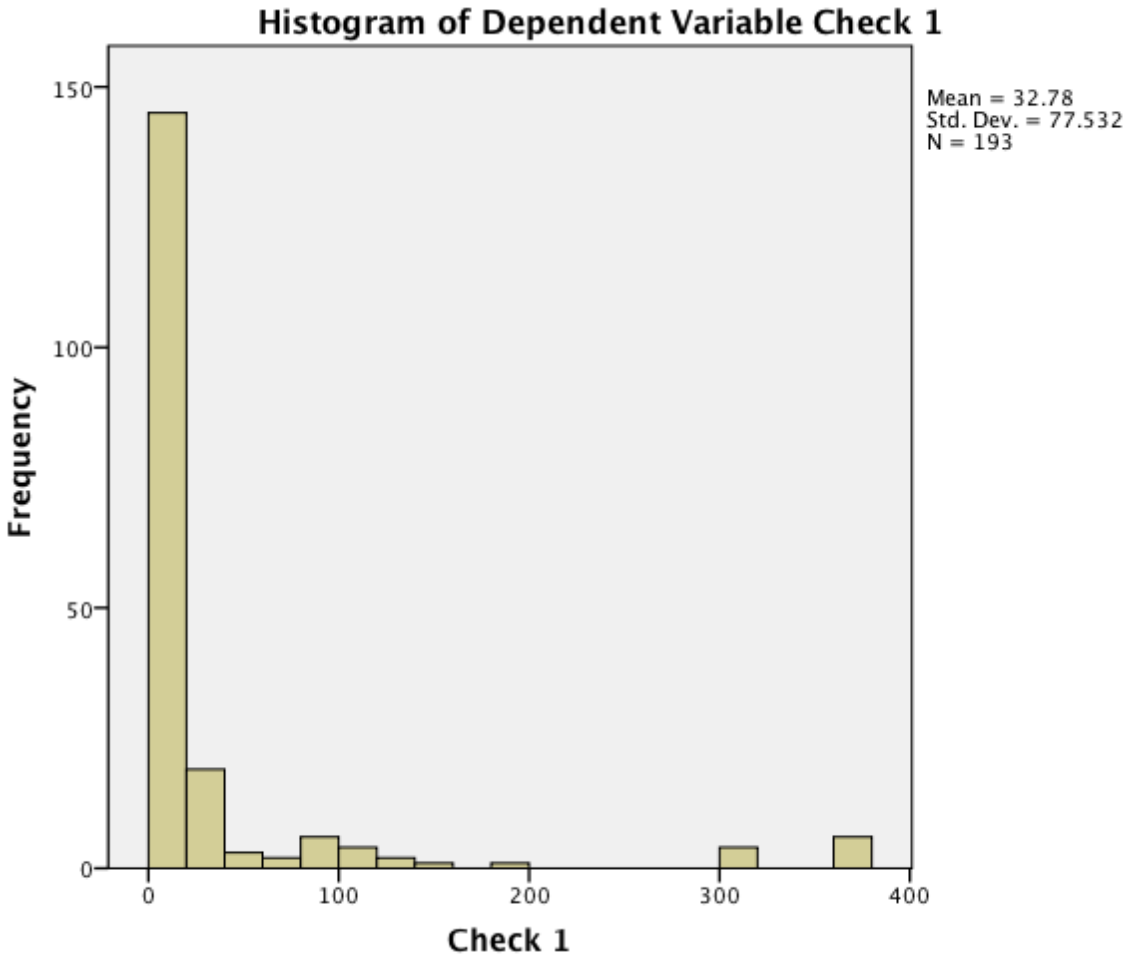

Figure 7. Histogram of Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" before log transformation.

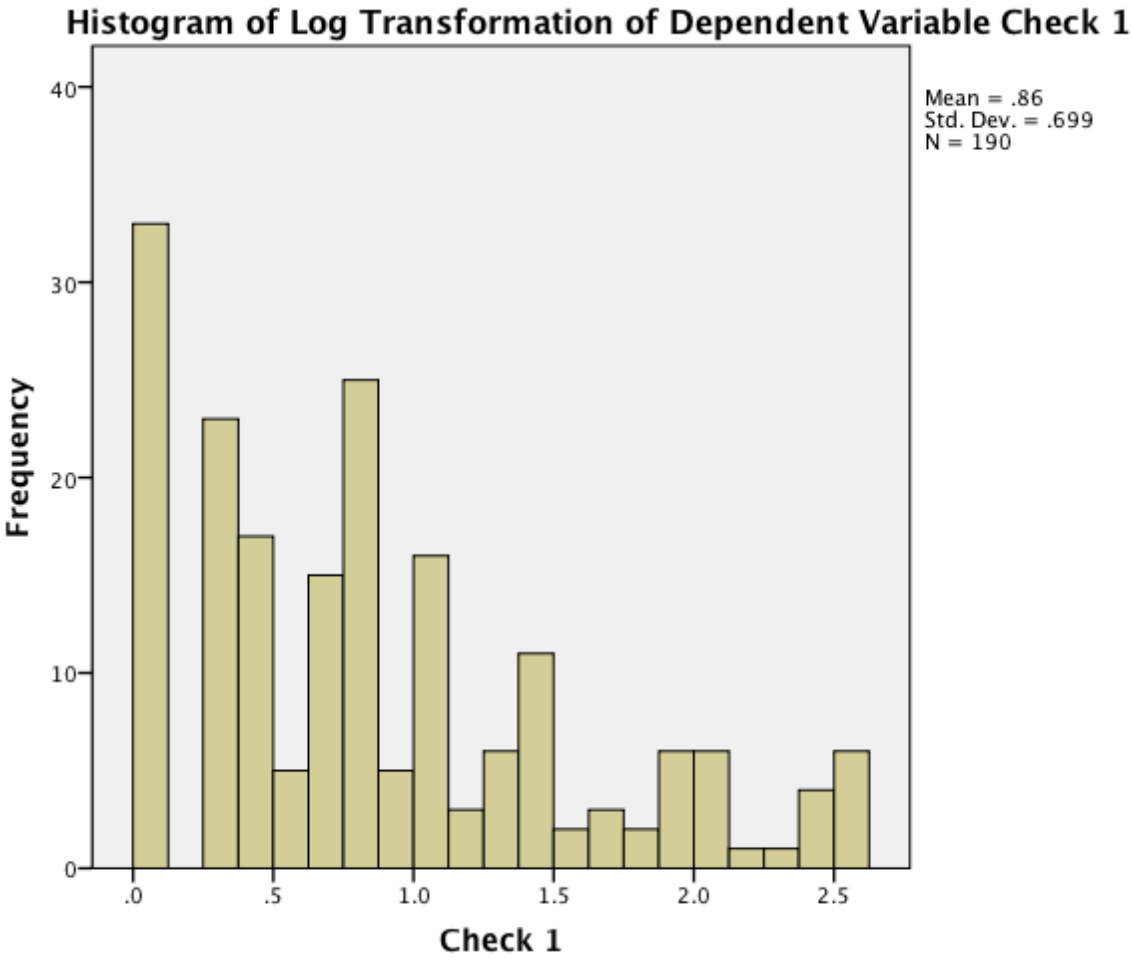

Figure 8. Histogram of Check 1: "If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring?" after log transformation.

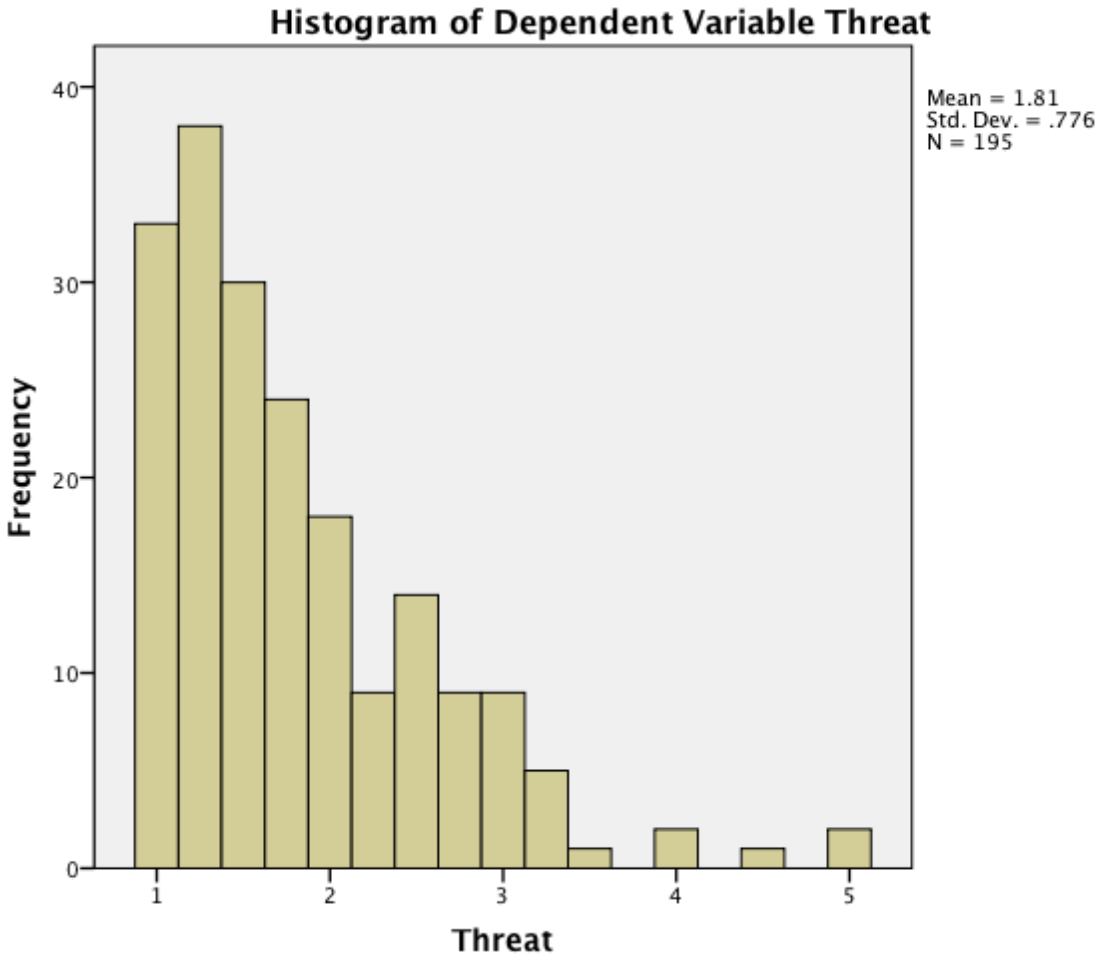

Figure 9. Histogram of threat before log transformation.

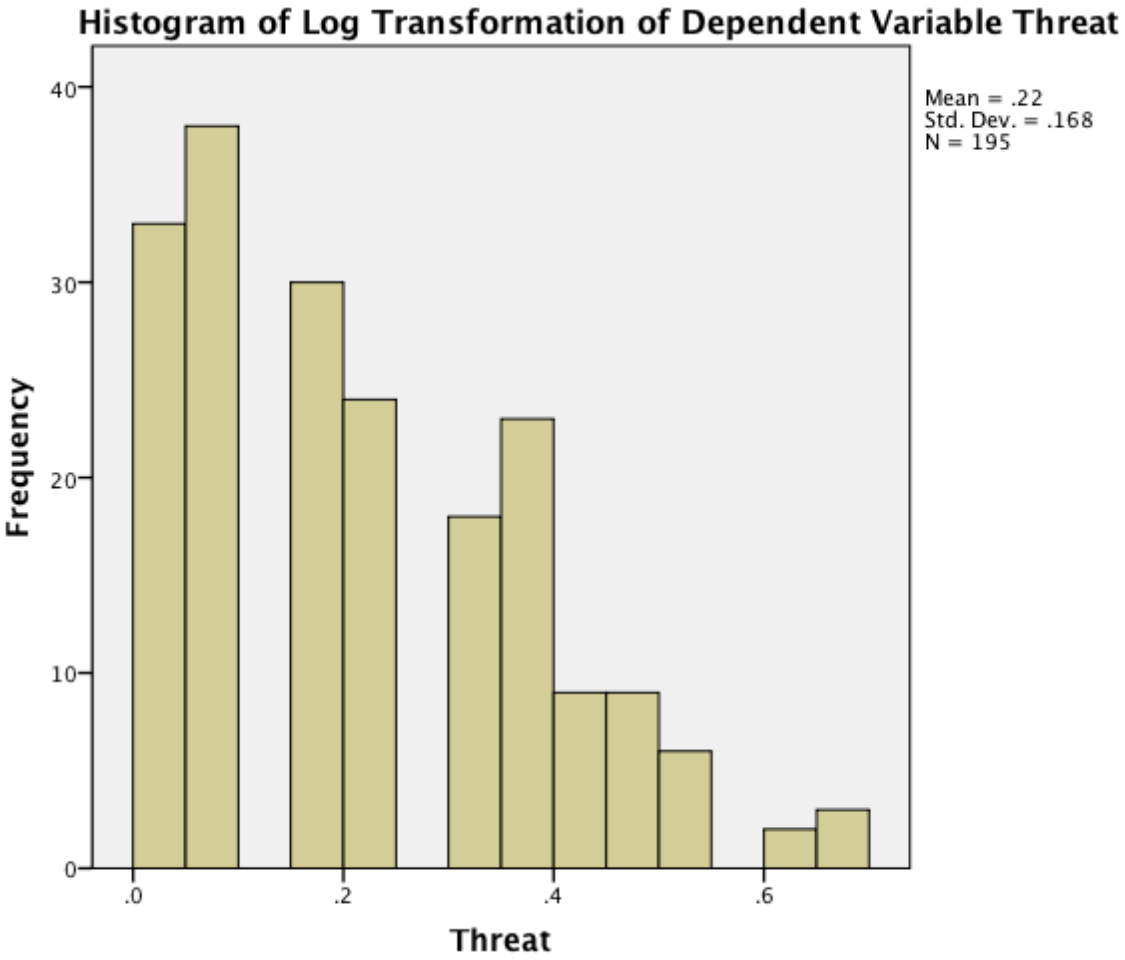

Figure 10. Histogram of threat after log transformation.

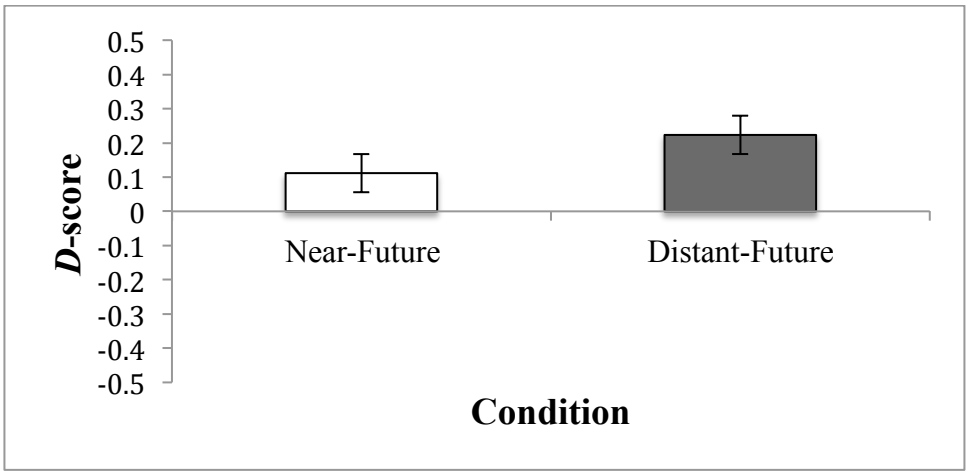

Figure 11. *D*-scores for congruent and incongruent pairings on the distance/threat IAT. Positive *D*-scores represent a stronger association between congruent pairings (near-time with threat and distant-time with non-threat). Error bars represent the standard error for each column.

Appendix A

Outline of Study Procedure

1. Read the consent form. By pressing the *"I agree"* button, participants acknowledge reading the information and their desire to participate. (1 minute)
2. Proactive coping scale (PCI, 14 items, 3 minutes)
3. MANIPULATION: Read about and visualize concrete or abstract features of stressful medical procedure (1 item, 5 minutes)
4. Temporal construal manipulation check (2 items, 1 minute)
5. Stress Appraisal Measure (SAM, 5 items, 2 minutes)
6. Implicit Association Test practice trials (20 trials, 5 minutes)
7. Implicit Association Test critical trials (40 trials, 10 minutes)
8. Zimbardo Time Perspective Inventory (ZTPI, 37 items, 7 minutes)
9. Conscientious Responders Scale (CRS, 5 items embedded randomly throughout above questionnaires, 2 minutes)
10. Demographic information (5 items, 2 minutes)
11. Demand characteristics check (3 items, 3 minutes)
11. Debriefing (2 minutes)

TOTAL TIME: 40-45 minutes

Appendix B

Temporal Construal Manipulation and Manipulation Check

Temporal construal manipulation:

Near-future condition:
"Please think about the following medical procedure and imagine yourself having this procedure done: *Having a blood sample drawn with a hypodermic needle.* Specifically, think about the bodily sensations you will feel, the examination room where you will be seated, and the medical tools used to conduct the procedure (e.g. needle, arm band)."

Distant-future condition:
"Please think about the following medical procedure and imagine yourself having this procedure done: *Having a blood sample drawn with a hypodermic needle.* Specifically, think about the purpose of having this procedure done, how it is important for your health, and how you will ultimately benefit from it."

Manipulation check for temporal construal:

1. If you were to have this procedure, how far away from today would you view this upcoming medical procedure occurring? _____Days from today

2. How far away do you view your upcoming medical procedure?

Please select the number that best describes your thoughts regarding your upcoming medical procedure, on a scale from 1 (very near) to 10 (very far away):

1	2	3	4	5	6	7	8	9	10
Very Near									Very Far Away

Appendix C

Proactive Coping Subscale (PCI; Greenglass, Schwarzer, & Taubert, 1999)

Instructions: 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 using the scale provided.

1	2	3	4
Not at all true	Barely true	Somewhat true	Completely true

---

1. I am a "take charge" person.
2. I try to let things work out on their own. (R)
3. After attaining a goal, I look for another, more challenging one.
4. I like challenges and beating the odds.
5. I visualize my dreams and try to achieve them.
6. Despite numerous setbacks, I usually succeed in getting what I want.
7. I try to pinpoint what I need to succeed.
8. I always try to find a way to work around obstacles; nothing really stops me.
9. I often see myself failing so I don't get my hopes up too high. (R)
10. When I apply for a position, I imagine myself filling it.
11. I turn obstacles into positive experiences.
12. If someone tells me I can't do something, you can be sure I will do it.
13. When I experience a problem, I take the initiative in resolving it.
14. When I have a problem, I usually see myself in a no-win situation. (R)

Appendix D

Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999)

Read each item and, as honestly as you can, answer the question: "How characteristic or true is this of you?" Circle the appropriate number using the scale.

Note: The *present fatalistic*, *present hedonistic*, and *future* subscales will be used.

1	2	3	4	5
Very Uncharacteristic	Uncharacteristic	Neutral	Characteristic	Very Characteristic

	1	2	3	4	5
1. I believe that getting together with one's friends to party is one of life's important pleasures.					
2. Familiar childhood sights, sounds, smells often bring back a flood of wonderful memories.					
3. Fate determines much in my life.					
4. I often think of what I should have done differently in my life.					
5. My decisions are mostly influenced by people and things around me.					
6. I believe that a person's day should be planned ahead each morning.					
7. It gives me pleasure to think about my past.					
8. I do things impulsively.					
9. If things don't get done on time, I don't worry about it. (R)					
10. When I want to achieve something, I set goals and consider specific means for reaching those goals.					
11. On balance, there is much more good to recall than bad in my past.					
12. When listening to my favorite music, I often lose all track of time.					
13. Meeting tomorrow's deadlines and doing other necessary work comes before tonight's play.					
14. Since whatever will be will be, it doesn't really matter what I do.					
15. I enjoy stories about how things used to be in the "good old times."					
16. Painful past experiences keep being replayed in my mind.					
17. I try to live my life as fully as possible, one day at a time.					
18. It upsets me to be late for appointments.					
19. Ideally, I would live each day as if it were my last.					

20. Happy memories of good times spring readily to mind.					
21. I meet my obligations to friends and authorities on time.					
22. I've taken my share of abuse and rejection in the past.					
23. I make decisions on the spur of the moment.					
24. I take each day as it is rather than try to plan it out. (R)					
25. The past has too many unpleasant memories that I prefer not to think about. (R)					
26. It is important to put excitement in my life.					
27. I've made mistakes in the past that I wish I could undo.					
28. I feel that it's more important to enjoy what you're doing than to get work done on time.					
29. I get nostalgic about my childhood.					
30. Before making a decision, I weigh the costs against the benefits.					
31. Taking risks keeps my life from becoming boring.					
32. It is more important for me to enjoy life's journey than to focus only on the destination.					
33. Things rarely work out as I expected.					
34. It's hard for me to forget unpleasant images of my youth.					
35. It takes joy out of the process and flow of my activities, if I have to think about goals, outcomes, and products.					
36. Even when I am enjoying the present, I am drawn back to comparisons with similar past experiences.					
37. You can't really plan for the future because things change so much.					
38. My life path is controlled by forces I cannot influence.					
39. It doesn't make sense to worry about the future, since there is nothing that I can do about it anyway.					
40. I complete projects on time by making steady progress.					
41. I find myself tuning out when family members talk about the way things used to be. (R)					
42. I take risks to put excitement in my life.					
43. I make lists of things to do.					
44. I often follow my heart more than my head.					
45. I am able to resist temptations when I know that there is work to be done.					
46. I find myself getting swept up in the excitement of the moment.					
47. Life today is too complicated; I would prefer the simpler life of the past.					
48. I prefer friends who are spontaneous rather than predictable.					

49. I like family rituals and traditions that are regularly repeated.					
50. I think about the bad things that have happened to me in the past.					
51. I keep working at difficult, uninteresting tasks if they will help me get ahead.					
52. Spending what I earn on pleasures today is better than saving for tomorrow's security.					
53. Often luck pays off better than hard work.					
54. I think about the good things that I have missed out on in my life.					
55. I like my close relationships to be passionate.					
56. There will always be time to catch up on my work. (R)					

Legend:

Past Negative: items 4, 5, 16, 22, 27, 33, 34, 36, 50, & 54

Past Positive: items 2, 7, 11, 15, 20, 25, 29, 41, & 49

Present Fatalistic: items 3, 14, 35, 37, 38, 39, 47, 52, & 53

Present Hedonistic: items 1, 8, 12, 17, 19, 23, 26, 28, 31, 32, 42, 44, 46, 48, & 55

Future: items 6, 9, 10, 13, 18, 21, 24, 30, 40, 43, 45, 51, & 56

Appendix E

Stress Appraisal Measure (SAM; Peacock & Wong, 1990)

These questions concern your thoughts about various aspects of your upcoming medical procedure. Select the number that best describes your thoughts about this event.

	Not at all	Slightly	Moderately	Considerably	Extremely
Did this medical procedure make me feel anxious?	1	2	3	4	5
How threatening is this medical procedure?	1	2	3	4	5
Is it going to have a negative impact on me?	1	2	3	4	5
Will the outcome of this medical procedure be negative?	1	2	3	4	5
How painful do you think this medical procedure would be?	1	2	3	4	5

Appendix F

Implicit Association Test Instructions and Stimuli

IAT Description:

In the IAT a participant responds to a series of items that are to be classified into four categories – typically, two representing concepts such as *flowers* versus *insects* and two representing attributes such as *pleasant* versus *unpleasant* valence. Subjects are asked to respond rapidly with a right-hand key press to items representing one concept and one attribute (e.g., *insect*s and *pleasant*), and with a left-hand key press to items from the remaining two categories (e.g., *flowers* and *unpleasant*). Subjects then perform a second task in which the key assignments for one of the pairs is switched (such that *flowers* and *pleasant* share a response, likewise *insects* and *unpleasant*). The IAT produces measures derived from latencies of responses to these two tasks. These measures are interpreted in terms of association strengths by assuming that subjects respond more rapidly when the concept and attribute are strongly associated (e.g., *flowers* and *pleasant*) than when they are weakly associated (e.g., *insects* and *pleasant*) (Greenwald, n.d.).

IAT Practice Trial Instructions:

"Put your middle or index fingers on the E and I keys of your keyboard. Words representing the categories at the top will appear one-by-one in the middle of the screen. When the item belongs to a category on the left, press the E key; when the item belongs to a category on the right, press the I key. Items belong to only one category. If you make an error, an X will appear - fix the error by hitting the other key.

This is a timed sorting task. GO AS FAST AS YOU CAN while making as few mistakes as possible. Going too slow or making too many errors will result in an uninterpretable score. This task will take about 5 minutes to complete."

IAT Critical Trial Instructions:

"See above, the four categories you saw separately now appear together. Remember, each item belongs to only one group. For example, if the categories “near-time” and “threat” appear on separate sides above - words meaning “near-time” would go in the “near-time” category, not the “threat” category.

The green and white labels and items may help to identify the appropriate category. Use the E and I keys to categorize items into four groups left and right, and correct errors by hitting the other key."

IAT Study Procedure:

To complete the IAT, participants first completed four blocks of 20 "practice trials" so that they were able to be familiar with the task, allowing them to understand and feel comfortable when completing the task. During the first two practice blocks, participants were asked to categorize the word that appeared in the middle of the computer screen as either a positive word (representing a non-threatening concept) or a negative word (representing a threatening concept; acquired from Herbert et al., 2006). They did this by pressing a key on the keyboard that corresponded with the side of the screen where the correct category was located. If, for example, the word "fail" was presented, participants hit the "e" key on the keyboard to classify it as a threatening word when the category "threat" was on the left side of the screen and "i" when the "threat" category was on the right hand side of the screen. The participants were then presented with near-time and distant-time words (acquired from Bar-Anan, Liberman, & Trope, 2006) and asked to categorize them by pressing a key on the keyboard that corresponded to the side of the screen where the correct category was located. For example, if the word "immediately" was presented, participants hit the "i" key on the keyboard if the category "near-time" was located on the right side of the computer screen. Participants were given feedback as to the correct and incorrect categorizations and were not allowed to move forward until they correctly categorized the stimuli (they had to correct a response if they got it wrong before moving on). The location of the categories was counterbalanced for half of the participants in that one category was on the left of the screen and for the other half of the trials, this same category was located on the right hand side of the screen to correct for the influence of right- or left-handedness. For the last two practice blocks, the same task was required of participants, however the category "near-time"

was paired with “threat” and “distant-time” was paired with “non-threat” (congruent condition) and then the category “near-time” was paired with “non-threat” and “distant-time” with “threat” (incongruent condition).

Next, participants completed two blocks of 40 critical trials, or “test trials”, in which the data were reported after the final analyses. For one half of the trials, the “threat” category was paired (meaning it shared a response key) with the “near-time” category (congruent pairing) and the “non-threat” category was paired with the “distant-time” category (congruent pairing). When temporal or (non) threat words were presented on the screen, participants classified each word into one of the categories by pressing the corresponding key as quickly as possible. For example, if the word “marvelous” was presented, participants would hit the “i” key to classify it as a non-threat word if the “non-threat” category was on the right of the screen. For the other half of the critical trials, the “non-threat” category was paired with the “near-time” category (incongruent pairing) and the “threat” category was paired with the “distant-time” category (incongruent pairing). Again, the location of categories was counterbalanced in that for half of the trials, one of the paired categories was on the left of the screen and for the other half of the trials, this same paired category was located on the right hand side of the screen to correct for the influence of right- or left-handedness.

The speed of reaction time during the IAT is based on a carryover effect due to the temporal construal manipulation presented before this task. This carryover effect has been shown to produce significant results in a number of studies utilizing the IAT, for example, investigating women’s self-identity with math versus the arts (Kawakami et al., 2008). Women trained to approach or avoid math by pulling a joystick toward them or pushing the joystick away from them, respectively, showed more identification with, and positive implicit attitudes during the IAT toward math than women trained to avoid math.

In this study, participants in the **near-future condition** (who should view the medical procedure as more threatening) were expected to be faster at categorizing a "near-time" word when it was paired with a threatening word rather than when paired with a non-threatening word. This was thought to be because the associations are strong between "near-time" and "threat" if a person is threatened by the medical procedure, therefore they will be faster at choosing the category that pairs the near-time and threatening words together than individuals who are not as threatened by the procedure (distant-future condition) (Greenwald, McGhee, & Schwartz, 1998). On the other hand, people in the **distant-future condition** were hypothesized to be slower at categorizing a "near-time" word when it was paired with a "threat" word than people in the near-future condition because the association between "near-time" and "threat" is not as strong.

Appendix G

Conscientious Responders Scale (CRS; Marjanovic, Struthers, Cribbie, & Greenglass, 2014)

Note: To use the CRS effectively, its items will be inserted randomly throughout the length of the questionnaires, not all in a row or cluster.

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

1. To answer this question, please choose option number four, “neither agree nor disagree.”
2. Choose the first option—”strongly disagree”—in answering this question.
3. To respond to this question, please choose option number five, “slightly agree.”
4. Please answer this question by choosing option number two, “disagree.”
5. In response to this question, please choose option number three, “slightly disagree.”

Since the content of the items above direct the participant how to respond, there is an objectively correct response for each item. In particular, each item answered correctly is given a score of 1 and for every item answered incorrectly, a score of 0 is administered. The score is totaled by summing up all of the participants’ correct responses. Therefore, the scores may range from 0 (indicating all incorrect responses) to 5 (indicating all correct responses).

Appendix H

Informed Consent Form

Date: April 23, 2015

Study Name: Impressions of medical procedures study

Researchers: Rachelle Sass (Graduate Student), Dr. Esther Greenglass (Supervisor)

Purpose of the Research: The purpose of this research is to examine how people evaluate and interpret descriptions of medical procedures and what general impressions are formed by various descriptions so that health professionals are able to create informative and tactful descriptions about their procedures.

What You Will Be Asked to Do in the Research: During the study, you will be asked to read about a medical procedure and then complete four short questionnaires about your thoughts and interpretation of the procedure, as well as a reaction time task. All measures will be administered on the computer. The study should take approximately 40-45 minutes in total.

Risks and Discomforts: We do not foresee any risks or discomfort from your participation in the research. If any of the materials in this study remind you of difficult personal issues that you would like to discuss, you may contact the Counseling and Development Centre (CDC) at York University. The CDC provides free, confidential counseling about personal issues on an individual basis.

Benefits of the Research and Benefits to You: Your participation in this study provides you with an opportunity to assist health practitioners in creating informative, non-threatening descriptions of valuable medical procedures. Completion of the study is voluntary and you may end your participation at any time without penalty. In exchange for your participation, you are eligible to receive one experiment credit from the URPP if completed for credit through the course PSYC 1010 – Introduction to Psychology. If you complete the study as an undergraduate

student at York University without being enrolled in PSYC 1010, you will instead receive an entry into a draw for one of ten gift cards or the grand prize of a Samsung Galaxy tablet.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. If you decide to stop participating, you will still be eligible to receive the promised course credits for agreeing to be in the project if enrolled in PSYC 1010. Likewise, you will be eligible to be entered into the draw even if you decide to withdraw from the study without completing it if participating as an undergraduate student at York University not enrolled in PSYC 1010. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researchers, York University, or any other group associated with this project now or in the future. In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible.

Confidentiality: All information you supply during the research will be held in confidence and your name will not appear in any report or publication of the research. All data and research materials will be securely stored by the researchers through password encrypted computer files and only research staff will have access to this information. The data will be securely stored for five years. After that time, it will be securely held in the archives of the principal investigator for the purposes of data sharing with other researchers upon request and to ensure long-term access so that data can be fully used and interpreted. The data will ultimately be destroyed through deletion of the data files. In our research papers, information from participants will be put into numbers, pooled, and statistically analyzed by computer. No identifying information will be used in reporting the results so that no person can be personally identified. Confidentiality will be provided to the fullest extent possible by law.

Questions About the Research? This research has been reviewed and approved by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to

the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process or about your rights as a participant in this study, please contact the Office of Research Ethics, York University. If you have further questions about this study or if you would like the results of the study, please feel free to contact the principal investigator, Rachelle Sass or Dr. Esther Greenglass of York University.

Legal Rights and Consent:

I consent to participate in the **Impressions of medical procedures study** conducted by *Rachelle Sass* and *Dr. Esther Greenglass*. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by agreeing to participate in this study. Clicking 'Next' below indicates my consent.

Appendix I

Demographic Information

1. What is your age? ____

2. What is your gender? ____ Female _____ Male

3. What is your year of study? _____

4. Is English your first language?

   - ❑ Yes
   - ❑ No

5. Do you have a medical history of (check all that apply):

   - ❑ Diabetes
   - ❑ Severe allergies
   - ❑ Neurological conditions
   - ❑ Psychiatric conditions
   - ❑ Respiratory conditions
   - ❑ Cancer
   - ❑ Heart disease
   - ❑ HIV/AIDS
   - ❑ Degenerative diseases
   - ❑ Physical or sensory disability
   - ❑ None
   - ❑ Other (please specify): _____

6. Please select the number that best describes your present state of health:

1	2	3	4	5	6	7
Very Unhealthy						Very Healthy

Appendix J

Demand Characteristics Check

1. As far as you can recall, what was the purpose of this study?

2. Was there anything about the study that you found confusing or unusual?

3. Was there anything about the study that made you feel uncomfortable?

Appendix K

Debriefing Form

The Effect of Temporal Construal and Proactive Coping on Threat Appraisal

You were told that the purpose of this research is to examine how people evaluate and interpret descriptions of medical procedures and what general impressions are formed by various descriptions so that health professionals are able to create informative and tactful descriptions about their procedures. This cover story was told because a complete explanation of the research goals may have biased responses. In actuality, the purpose of this research is to determine whether people who are more threatened by a stressful event will view the event as closer in time than those who are less threatened by the event. It has been demonstrated that if a person focuses on the concrete, specific details of an event, they will view the event as being psychologically closer in time and if they focus on abstract, non-specific details of an event, they will view the event as being psychologically farther away in the future.

In this study, we presented you with a stressful situation (a medical procedure involving blood being drawn from your arm with a hypodermic needle) described in either concrete or abstract terms. We then asked you to fill out a survey to evaluate the threat caused by this medical procedure and complete a reaction time task to see whether the concept of time—"near future" and "distant future" words—is associated with threat—"negative" (threatening) or "positive" (non-threatening) words. This way, if we find any differences between the two conditions, we can most likely attribute them to the way you interpreted the procedure based on the concrete or abstract description and the amount of threat it caused. We will also be looking at differences in people's coping style to a stressful event and whether this will also affect feelings of threat from the medical procedure.

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 will detract from the validity of the research findings. We are most grateful to you for taking the time to participate in this important research which will contribute to knowledge about how people cope with threat. If you have any questions or concerns about this research, please feel free to contact Rachelle Sass (researcher) or Dr. Esther Greenglass (thesis supervisor) of York University. Thank you.

Appendix L

Transformation of Data

Two variables in this study were transformed due to the uneven distribution of data: Check 1 and threat. In particular, to examine the normality of the data, both plots and calculations were used to determine the distribution and amount of skew. I examined histograms of the variables under study as well as conducting calculations which involved dividing the skewness value by the standard error. As a general rule, if the result of this calculation has an absolute value greater than 3.29, then the data are significantly skewed at $p < .001$ and will be closer to normal if transformed (Field, 2013). If the transformation reduces this number to a substantial degree (less than or close to 3.29), then the skewness has been corrected for. Figures 7 – 10 show histograms before and after log transformations of the variables Check 1 and threat, whereas Tables 39 – 42 show descriptives demonstrating the skewness and standard error values of these variables; the data from all other variables approximated normal.