



6-2010

Regulatory focus and decisional delay: Chronic indecision caused by a prevention focus

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Recommended Citation

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REGULATORY FOCUS AND DECISIONAL DELAY:
CHRONIC INDECISION CAUSED BY A PREVENTION FOCUS

A Dissertation

Presented in

Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy

BY

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JUNE, 2010

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ACKNOWLEDGMENTS

I would like to express my sincere appreciation to my dissertation chair, Joseph Ferrari, for his support and encouragement throughout this project. Over the years, his guidance in the process has been of great help. I'd also like to thank my committee, but most especially David Allbritton and Jessica Choplin. Their questions and suggestions provided me with the opportunity to make additional insights that I'm not sure I would have thought about otherwise. I would also like to thank my wife, Carissa, for her patience and encouragement throughout the process. She had been extremely supportive and provided the impetus for me to continue when I otherwise may not have. Without her, I'm not sure I would have finished this lengthy process. She is my better half. Last and not least, I want to say that I'm also doing this for my sons, Nathaniel and Samuel. I hope this work shows them what they can accomplish when they must enough self-discipline and stick-to-itedness.

VITA

The author was born in Alton, Illinois, on April 11, 1975. He graduated from Roxana Community High School in 1993, received his Bachelor of Science degree from the University of Illinois at Champaign-Urbana in 1997, and received his Masters of Arts in Experimental Psychology from DePaul University in 2000. He currently is a Manager of Market Research at the Career Education Corporation focusing on consumer research both quantitative and qualitative.

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“There is no more miserable human being than one in whom nothing is habitual but indecision.”

William James, The Principles of Psychology (1890)

The quote from William James implies that decisions are a part of all people's lives. Some decisions that individuals make have far-reaching effects (e.g., *what college to attend?; should I marry?*), while other decisions are trivial and have little effect beyond the immediate future (e.g., *what to eat for breakfast?; what shirt will I wear to work?*). However, nearly everyone has experienced a decision where they simply did not care about which option they chose. Consequently, they may have experienced a moment or two of *indecision* regarding what to do. Other times, several options may have benefits and drawbacks that conflict, again resulting in indecision.

Some people report high levels of chronic indecisiveness in their daily lives (c.f. Ferrari, Johnson, & McCown, 1995). That is, these persons report that they frequently and consistently delay making decisions. Mann (1982) labeled these persons who engaged in frequent decisional delay as “*Indecisives*.” Consequently, the chronic delay or avoidance of decision-making has been called *decisional procrastination* (Ferrari et al., 1995). Conversely, people who do not engage in frequent decisional delay are called “*Decisives*.”

Research into potential causes of chronic indecision indicate that gender seems to play little role in chronic indecisiveness (e.g., Effert & Ferrari, 1989; Ferrari, 1992; Ferrari, 1995; Ferrari et al., 1995; Harriott & Ferrari, 1996; Harriott, Ferrari, & Dovidio, 1996; Specter & Ferrari, 2000). Neither do cognitive deficits or impairments (i.e., in the sense that indecisives function in a clinically normal fashion) seem to cause chronic

indecision nor were scores on a measure on chronic indecision related to scores on an intelligence test (Ferrari & Dovidio, 1997).

Other research points towards some potential causes, but each has flaws. Ferrari and Olivette (1994) found that woman raised in homes with authoritarian fathers (c.f., Baumrind, 1970) tended to report higher scores on a measure of indecision ($r = 0.32$). However, this study examined only women; it remains unclear if authoritarian parenting by mothers and/or fathers has an effect on future chronic decisional procrastination in men, and what the mechanism of the effect may be. In a review of *decisional avoidance* (i.e., situational decisional procrastination) literature, Anderson (2003) hypothesized that chronic indecisiveness may be a result of trait neuroticism, but ascribing the cause of one personality variable to another merely shifts from one personality variable to another without explaining the cause of the second trait.

Another potential cause, stress, has more research behind it. Janis and Mann's (1977) theory of decision-making under conflict suggested that decisional procrastination (as a part of a broader decision coping pattern called *Defensive Avoidance*) may be due to stressful situations and lack of options perceived as good, but its primary focus is situational rather than chronic indecisiveness, though later work (Mann, Burnett, Radford, & Ford, 1997) suggested individual differences in stress tolerance could lead to more frequent use of decisional procrastination as a tactic. A more recent study (Ferrari and Pychyl, 2007) provides evidence that suggests sensitivity to stress may cause chronic decisional procrastination. In two experiments, the researchers found that indecisives tended to deplete their self-control resources more than decisives (Ferrari & Pychyl, 2007). The temporary reduction in the ability to regulate behavior in indecisives

compared to decisives pointed towards an inability to effectively cope with stress or threats (c.f., Muraven & Baumeister, 2000; Lazarus & Folkman, 1984). However, that leaves open the question of what might cause indecisives to have larger reductions in their ability to regulate behavior, compared to decisives.

Rather than focusing on personality traits (such as neuroticism or conscientiousness), Higgins (2000a) suggested a combination of *cognitive accessibility* (i.e., the activation potential of information in memory) and *motivational focus* (Higgins specifically mentioned regulatory focus) may be the influential aspects of a person's behavior. Consequently, the present study focused on Higgins's *Regulatory Focus Theory* (Higgins, 1997; 1998) as an explanation for a person's temporary reduction in the ability to regulate effectively their behavior. More specifically, the present study examined one type of regulatory focus, called a *prevention focus*, as a potential cause for self-regulation failure by indecisives.

Regulatory Focus Theory and Chronic Indecision

Regulatory Focus Theory distinguishes between two different kinds of end states or goals: those related to advancement and growth and those related to safety and security (Higgins, 1997). Instead of concentrating on presence of a positive outcome (a gain) or the presence of a negative outcome (a loss), the theory adds the consideration of absence of both positive and negative outcomes (non-gains and non-losses, respectively; Higgins, 1997). *Ideal self-guides* (because they focus on hopes and dreams; c.f., Higgins, 1987) are considered by the theory to be related to regulatory focus concentrated on advancement and growth, a *promotion focus*. *Ought self-guides* (because they focus on mismatches to desired end states; e.g., living up to one's responsibilities; c.f., Higgins,

1987) are considered to be related to a regulatory focus concentrated on safety and security, a *prevention focus*.

A promotion focus is concerned with the presence or absence of positive outcomes (i.e., getting that new job, a gain, or not getting it, a non-gain). This acts like a maximal goal, or a standard that individuals hope to achieve (e.g., do your best; Idson, Liberman, & Higgins, 2000). A prevention focus, meanwhile, is concerned with the presence or absence of negative outcomes (i.e., keeping your job, a non-loss, or losing your job, a loss). This focus acts as a set of conditions as to what a person should do at a minimum (Idson et al., 2000).

Regulatory focus theory also makes predictions concerning the type and intensity of emotions experienced based on the outcome. The theory predicts that respective pleasure and pain of gains and losses are experienced more intensely than the same for non-gains and non-losses. In the case of gain versus non-loss, a promotion success (gain) is the achievement of a maximal goal while a prevention success (non-loss) is the achievement of a minimal goal. On the other hand, a prevention failure (loss) is the failure to achieve a minimal goal and a promotion failure (non-gain) is the failure to achieve a maximal goal (Idson, et al., 2000). The type of emotions experienced also may differ depending on the outcome. There is evidence that promotion success (gains) produce cheerfulness-related emotions, and prevention success produce quiescence-related emotions (e.g., security or confidence; Higgins, 2001) while promotional failure produces dejection-related emotions and prevention failure produce agitation-related emotions (e.g., anxiety and worry; Higgins, 1998).

Prior research found those who report higher amounts of chronic indecision also tend to report a constellation of emotional experiences seemingly related to those described for individuals experiencing a prevention focus (Higgins, 1998; 2001). Compared to decisives, indecisives report having lower confidence in their decision-making skills (Greblo & Mirels, 1997), more judgmental self-doubt (Mirels, Greblo, & Dean, 2000), a higher need for certainty in their decisions (Frost & Shows, 1993), and a greater intolerance for uncertainty (though that study only examined women; Rassin & Muris, 2005). Additionally, chronic decisional procrastination may be related to anxiety-based emotions. Research has found that indecisives tend to report more worry-proneness (Rassin & Muris, 2005), worry (Spada, Hiou, & Nikcevic; 2006), trait *Neuroticism* on both Costa and McCrae (1992) *Five Factor Model* (Milgram & Tenne, 2000) and Eysenck's Neuroticism Scale (Beswick & Mann, 1994), and manifest anxiety (Hammer, 2000).

Moreover, a regulatory focus may be situationally-induced or an individual difference variable (Higgins, Shah, & Friedman, 1997). If a self-guide is made more available or accessible, then the regulatory goals associated with it may predominate. Self-guides that are chronically more accessible can lead to a dispositional regulatory focus. Higgins and Silberman (1998) also found that differences in parenting style can make different self-guides stronger: parenting that focused on protection and using punishment to discipline can make ought self-guides stronger (leading to a prevention focus) and parenting that focused on praising accomplishments and using withdrawal of affection to discipline can make ideal self-guides stronger (leading to a promotion focus).

One interesting aspect of a prevention focus is that it may require more frequent use of attentional resources. In order to help avoid undesired end states, Higgins (1997, 1998) suggested that a prevention focus may result in greater *strategic vigilance* (i.e., vigilance in the sense of paying close attention). Supporting this hypothesis, Forster, Higgins, and Bianco (2003) found that a prevention focus may lead to strategic vigilance to minimize errors while a promotion focus may lead to strategy of speed and efficiency. They found that people with a prevention focus may take longer on tasks like proofreading compared to those with a promotion focus, but those with a prevention focus also may have higher accuracy. This may link *regulatory focus theory* with *ego-depletion*, the temporary depletion of resources available to regulate behavior (c.f., Muraven & Baumeister, 2000) examined by Ferrari and Pychyl's (2007) experiment.

Ego-depletion, Vigilance and Regulatory Focus

Muraven and Baumeister (2000) discuss vigilance as one method by which self-control resources may become depleted. They noted that vigilance may require constant monitoring of the environment and mental processes, and people poorer at self-control may score lower on tests of vigilance (e.g., people with ADHD; Barkley, 1997). Other processes that deplete self-control reserves include decision-making, mood regulation, and coping with stressful situations (Muraven and Baumeister, 2000).

An experiment conducted by Trawalter and Richeson (2006) suggests a direct link between a prevention focus and ego-depletion may be accurate. The researchers placed participants into an interracial interaction with the instruction either to avoid prejudice, to promote a positive interracial exchange, or with no instruction on goals. Subsequent to this interaction, they gave participants a Stroop Color-Word task (Stroop, 1935), as used

in at least one other ego-depletion study (Wallace & Baumeister, 2002) to evaluate the relative levels of self-control resources available to people. Trawalter and Richeson (2006) found that people in the “avoid prejudice” and control conditions performed worse on the Stroop task than people in the “promote a positive exchange” condition. This suggests a prevention focus may lead to depleted self-control resources for later functioning (at least shortly after a situation in which a prevention focus was strong).

In examining ego-depletion and chronic decisional procrastination, Ferrari and Pychyl (2007; Experiment 1) placed participants under one of three feedback conditions for a Stroop task: success (participants were told they were doing better than other participants), failure (participants were told they were doing worse than other participants), and no feedback. Taken with indecisives’ lack of confidence (Effert & Ferrari, 1989; Greblo & Mirels, 1997), Ferrari and Pychyl (2007) expected the lack of feedback would require indecisives to expend extra effort to maintain speed and accuracy, more so than for decisives. However, an alternate explanation may be that the lack of confidence indecisives display reflects the goal of avoiding mistakes found in a prevention focus (Higgins, 1997; 1998).

After 100 Stroop trials, participants then completed a task tasting a foul “sports drink” (in fact, a mixture of orange juice, vinegar, and water), requiring them to further engage in self-control to do so. Indecisives in the no feedback conditions drank significantly less of the liquid than the other groups. As predicted, indecisives in the no feedback condition also spent more time on each Stroop task trial, compared to decisives in the same condition, suggesting indecisives indeed may have spent more cognitive resources because in addition to processing the stimuli they also were thinking about how

they were performing (Ferrari & Pychyl, 2007). In the second experiment, Ferrari and Pychyl (2007) found that indecisives may be aware of decrements in their self-control resources. As they progressed through the Stroop trials, indecisives' predictions about the number of cups they thought they would drink declined while the decisives' predictions remained constant. After the Stroop task, indecisives again drank fewer cups of the "sports drink," compared to decisives. They also took longer to make a decision in the Stroop task trials, compared to decisives.

The difference between indecisives and decisives in the no feedback condition on the amount of fluid consumed suggests that indecisives may function using a prevention focus. However, indecisives in the failure condition recorded similar response times and consumed similar amounts as decisives. With a prevention focus, it may be reasonable to expect that the goal of avoiding mistakes would have become stronger and thus spent more time examining each Stroop trial and thus more ego-depletion would occur. It may be that the feedback removed the need for strategic vigilance because feedback was provided online, removing the need for vigilance, and consequently consuming fewer resources.

Stress and Decision-Making

It seems unlikely that merely having fewer self-regulatory resources available "automatically" results in chronic indecision. In contrast, it seems probable that when faced with simple, less challenging decisions people are less likely to be indecisive. However, when confronted with complex, challenging choices, indecision emerges especially for persons with a disposition toward indecisiveness. As argued by Baumeister and his colleagues (c.f., Muraven & Baumeister, 2000; Wallace & Baumeister, 2002), the

availability of resources for behavior regulation may affect people's ability to cope with stress. In this with this, Lazarus and Folkman (1984) elaborated a model of stress and coping that relies on a two-step cognitive appraisal in a given situation. People first assess whether or not a situation (i.e., a task, a decision, etc.) poses a threat to them. Then they decide whether or not they have the resources to effectively cope with the threat.

The amount of resources at hand may dictate how people cope with the stress (Lazarus & Folkman, 1984). When people feel they have sufficient resources, they may tend to engage in *problem-focused coping*. In this case, people defend against the threat by defining the problem at hand, creating solutions to deal with the problem, and weighing the cost and benefits of each solution before implementing them (i.e., they interact with their environment to effect a change). However, if a person feels there are inadequate resources for coping directly (e.g., lack of personal capacity to cope), they may experience greater anxiety or other negative emotions and engage in *emotion-focused coping*. In this case, coping involves somehow reducing or tolerating the negative emotions characterized as stressful.

Decision-Making under Conflict

Stress (or other conflicts) may affect how people cope with a decision. Janis and Mann's (1977) theory of decision-making under conflict proposed that people may tend to use of any of five different coping patterns when there is some sort of stress or other conflict. In any given situation, the presence or absence of three conditions is thought to determine which coping pattern is used: 1) awareness of the risks about alternatives; 2) hope of finding a better alternative; and, 3) the belief there is adequate time to search for information and deliberate before making a choice (Janis & Mann, 1977; Mann, Burnett,

Radford, & Ford, 1997). It is also thought that a person will rely on a particular pattern of coping given such things as tolerance of stress, sensitivity to time pressure, and other individual difference variables (Mann et al., 1997).

Each of the five coping patterns possesses unique attributes, but of them, only one, *vigilance* (not to be confused with the earlier use of the term), is an adaptive decision-making pattern, characterized by a thorough search of information and consideration of all alternatives. For each of the other coping patterns (hypervigilance, unconflicted change, unconflicted adherence, & defensive avoidance), a person is missing one or both of these two characteristics, resulting in a nonadaptive style. For instance, in hypervigilance, people will search frantically for a way out of a dilemma, but because of time constraints, the person acts impulsively with a hastily created solution (i.e., the full range of information is overlooked).

Decisional procrastination is derived from the coping pattern of *defensive avoidance* which may occur when the alternatives available to a person are all relatively unpleasant or a person is under a great deal of stress (Janis & Mann, 1977; Friedman & Mann, 1993). In defensive avoidance, information is neither assimilated nor interpreted in a way that promotes making a decision (Janis & Mann, 1977). Depending on the situation, defensive avoidance can take one of three different forms: *buckpassing*, *rationalization*, and *evasion*. In evasion, a person avoids making a decision entirely (i.e., they engage in *decisional avoidance* or procrastination). According to Janis and Mann (1977), this usually will occur in situations where the problem is immediate and no particular option offers a clearly better outcome than the other options that are available.

Further research examined aspects of the Janis and Mann's (1977) theory of decision-making finding that threats or stressors may cause changes in behavior and a lack of those threats produced little or no change (Mann & Dashiell, 1976; Moore, Jensen, & Hauck, 1990). Additional research has found evidence that the decisional coping patterns may be generalized across cultures (Friedman & Mann, 1993, Mann et al., 1998) and that a person may rely on one decision strategy more often than others (Janis & Mann, 1977; Friedman & Mann, 1993; Mann et al, 1997).

Information Search and Emotion-focused Coping

Relevant to Janis and Mann's (1977) decision-making theory, one experiment (Luce, Bettman, & Payne, 1997) indicates that how people search information may be revelatory of the type of coping being used. Luce et al (1997) hypothesized that strong negative affect would result in people using both problem-focused and emotion-focused coping simultaneously because negative affect would signal decision importance but increase the use of decisional avoidance tactics by increasing the perception of threat. That is, participants in a decision situation laden with negative affect would search more information overall but also tend to use a heuristic information search pattern (i.e., search information by attribute). The concept behind this hypothesis is that people may use noncompensatory strategies (i.e., non-normative) in order to cope with emotion inherent to the situation but at the same time increase their effort in decision-making. The researchers argued that emotion-focused coping can involve avoidance by many means, ranging from not making a decision at all (i.e., Janis & Mann's decisional avoidance), changing subjective meaning of the situation (e.g., Luce et al note one example can be

blaming another for the situation), or using heuristic search strategies (e.g., searching by attributes).

To test their hypothesis, Luce et al. (1997) used a computerized version of Payne's (1976) information board. Payne's (1976) original version used a posterboard with index cards where information is presented in an "n" by "n" matrix with alternatives in rows and dimensions of attributes in the columns, but the computerized version displayed the information on a screen with the attributes of each alternative masked. Participants accessed information by clicking on the desired cell in the matrix, which would then be available for viewing. This paradigm is known as the "behavioral process approach" (Jacoby, Jaccard, Kuss, Troutman, & Mazursky, 1987), and allows tracking of how much information is searched, the order in which it is searched, the time from start to finish, and other variables that an experimenter may wish to obtain. They were allowed to access as little or as much information as they wanted and so repeated this procedure until they had viewed enough cells to make a decision.

As predicted, Luce et al (1997) found participants who had been induced to feel greater negative affect processed more information (i.e., opened more cells in Payne's information board) than when less negative affect was induced, but at the same time, individuals who experienced greater negative affect searched by attribute rather than alternative, as predicted if participants were also engaging in decisional avoidance. Moreover, the researchers found that increased negative affect increased the perception of threat. Additionally, the researchers also analyzed participants' information search over duration of the experiments. The data from all three experiments in the study were pooled, and, when search patterns were analyzed, participants in the high emotion

conditions started off their search in a relatively attribute-based manner and used it for longer than the researchers considered normal. The participants then finished by searching across dimensions of attribute, focusing on the alternative they would eventually choose. Luce et al (1997) interpret the results as the participants as examining the attributes in order to make a choice without having to engage in any difficult trade-offs.

It is important to note that Luce et al (1997) examined only the effects of negative affect on coping strategy without regard to presence or absence of resources with which to cope. Presumably, the amount of coping resources varied randomly across their participants and any decrements in problem-focused coping would have been randomly distributed across conditions. Theoretically if participants in any group where negative emotion was strong had less coping resources, it seems likely that group would have engaged in less problem-focused coping.

Indecision and Information Search.

In a similar vein, Ferrari and Dovidio (2000, 2001) provided evidence that indecisives, compared to decisives, search information differently as cognitive resources become taxed. They examined how indecisives and decisives searched information to make a decision in simpler versus more complex situations (Ferrari & Dovidio, 2000) and when under lower versus higher cognitive loads (Ferrari & Dovidio, 2001). Both studies used the original posterboard version of Payne's (1975) information board with information stored in envelopes that participants would search by pulling out an index card and turning it so the information on it was visible.

Ferrari and Dovidio (2000) claimed indecisives and decisives may differ in how they go about making decisions under simple and complex situations. To test this hypothesis, they manipulated the complexity of the decision task by expanding (or contracting) the number of index cards a participant would see, going from four attributes to six and from two alternatives to five (i.e., possibly making one version of the task more stressful than the other by increasing trade-offs required when more attributes were present, Luce, 1998). The researcher's primary dependent measures were the *depth of the search* (defined as the amount of total information search, information searched on the chosen alternative, & information search on the non-chosen alternatives), the *search sequence*, and time taken to complete the task (though participants were not given any time limits).

Compared to the simpler task, indecisives in the more complex task tended to search information by attribute and when searching by alternatives, they usually only examined one. Indecisives in the complex task also tended to search a larger proportion of the information about the alternative they eventually chose compared to the alternatives that they did not choose. In contrast, decisives were less selective in their information search, opting to examine a larger proportion of the non-chosen alternatives' information than indecisives. Indecisives also tended to prefer to search within the dimensions of attributes (i.e., to focus on attributes within a specific column) while decisives tended to search within the alternatives (i.e., across dimensions of attributes). In addition, Ferrari and Dovidio found that indecisives took longer to complete the task than decisives.

In a subsequent study, Ferrari and Dovidio (2001) examined how indecisives avoided searching more information than decisives when under high cognitive load (i.e., also adding more stress to the decision situation), using the same information board paradigm outlined in Ferrari and Dovidio (2000). Holding a set of eight random digits in working memory and/or counting random clicks during the task were used as two cognitive load manipulations. The digit set manipulation alone did not affect indecisives' search patterns. In contrast, counting clicks showed a significant difference in performance for indecisives versus decisives. Again, indecisives tended to make more cell shifts within attributes and search relatively less information that was available compared to decisives even more so than without the cognitive loads.

Ferrari and Dovidio's (2000, 2001) experimental studies increased the cognitive effort required indecisives, much like the situation for participants in Luce et al (1997). Although the environmental stress conditions were cognitive variables (i.e., increased information complexity or cognitive loads) rather than affective factors in both Ferrari and Dovidio's studies, indecisives switched to search strategy similar to the avoidant pattern similar to outcomes reported by Luce et al. (1997). The heuristic strategy of eliminating alternatives based on non-preferred attributes requires fewer cognitive, executive resources and may be even easier in terms of required effort (Payne, Bettman, & Johnson, 1993). Consequently, it is proposed that when indecisives experience high stress levels, they may respond with coping strategies that require fewer resources.

Regulatory Fit

However, depletion of self-control resources may not necessarily mean that both decisives and indecisives will not apply self-control resources in later situations. In the

literature on ego-depletion, one experiment found that people who form goals before undergoing ego-depletion continue to work on an unsolvable puzzle longer than those individuals who did not set a goal (Webb & Sheeran, 2003). This result suggested that even ego-depleted individuals may put energy into tasks that they are motivated to complete.

Similarly, Higgins and his colleagues (e.g., Higgins; 2000b; Shah, Higgins, & Friedman, 1998; Higgins, Idson, Frietas, Spiegel, & Molden, 2003) found that when goal-directed behaviors fit the regulatory foci people possess, a phenomenon called *Regulatory Fit* occurs (Higgins, 2000b). When this fit occurs, people may experience greater motivation to work on a task. Specifically, Higgins (2000b) described regulatory fit as the experiences people have when the means they choose to perform a task matched their regulatory orientations. That is, regulatory fit is the extent to which a method a person uses to perform a task matches their self-regulatory frame.

For example, one study (Shah et al., 1998) found that when a person's predominant regulatory focus matched a subsequent framing condition (i.e., approaching a gain; "earn an extra dollar for good performance" vs. avoiding a loss; "not lose a dollar for not missing many"), people with a promotion focus tendency performed better in the "approaching a gain" frame than in the "avoid a loss" frame. In contrast, the opposite occurred for people who tend toward a prevention focus. Another study (Frietas, Liberman, & Higgins, 2002) found that the enhanced motivational tendency of regulatory fit may also help people with a prevention focus avoid distractors while engaging in a task. Taken together, these lab-based studies suggested that enhanced motivation under

regulatory fit also may apply to everyday tasks, including report writing and dieting (Speigel, Grant-Pillow, & Higgins, 2004).

Higgins's (2000b) regulatory fit model and Janis and Mann's (1977) conflict theory of decision-making seem to share similar postulates. One might hypothesize that to the extent the nature of the stress or conflict fits the regulatory focus of a person they may be more (or less likely) to use a vigilant coping pattern. For example, decisional conflicts because of a loss (c.f., Baron & Ritov, 1984; Tversky & Kahneman, 1977) might be more motivating for someone with a prevention focus, while decisional conflicts because of a non-gain might be more motivating for someone with a promotion focus. With increased motivation in a decision situation, there may be increased desire for accuracy. It may require greater effort to compensatory processing of alternatives (i.e., evaluation by alternative; c.f., Payne, et al., 1993), but the results may tend to be more accurate (as opposed to effort minimization; Payne, Bettman, & Luce 1996).

Indecisives and Confidence to Make a Decision

Likewise, indecisives may not always use a non-compensatory strategy to make decisions (i.e., they may use a non-avoidant strategy). Hammer (2000) used a computerized version of Payne's (1976) *information board* to investigate the effect of task-relevant cognitive loads on information search by indecisives and decisives (replicating prior research by Ferrari and Dovidio, 2000; 2001). Hammer (2000) used two different cognitive loads: requiring some participants to hold information from the cells in memory by allowing each cells to be seen only one; and; requiring some participants to record their confidence to make a decision after viewing each piece of information.

However, Hammer (2000) found that the effect of recording confidence to make a decision (or not) had varying effects on indecisives and decisives. Recording confidence to make a decision may have acted as a cognitive load for decisives (i.e., they responded as expected if under a load; moving to a noncompensatory strategy to minimize effort), but indecisives did not perform as expected if writing confidences had acted as a cognitive load. Indecisives in the “no confidence recording” condition made proportionately fewer inter-dimensional shifts (search by alternative rather than by attribute), and proportionately more intra-dimensional shifts compared to decisives. Indecisives who monitored their confidence to make a decision made fewer intra-dimensional shifts and more inter-dimensional shifts. However, the reverse was true for decisives; they tended to make proportionately fewer intra-dimensional shifts and more inter-dimensional shifts when not recording their confidence to make a decision while making more intra-dimensional shifts and fewer inter-dimensional shifts when recording their confidences to make a decision.

Consistent with Frost and Shows (1993), indecisives may have reached a higher level of certainty by doing a more extensive information search. There is some research linking need for confidence with risk reduction (Raghunathan & Pham, 1999). Perhaps, a goal of risk reduction would be to avoid losses, a prevention focus goal. By focusing indecisives’ attentions towards feelings of confidence, these individuals may have increased regulatory fit to the task at hand. As a consequence, they may become more motivated and engage in more effortful decision-making strategies.

RATIONALE

It seems logical that decisional procrastination possesses more than one cause. Anderson (2003) claimed that decision avoidance is itself a multifaceted phenomenon, and it is likely to be the same for decisional procrastination. A review of the literature suggests that *Regulatory Focus Theory* and *Regulatory Fit* (Higgins, 1997; 1998) may provide an explanation for decisional procrastination and some of the present result literature.

Indecisives, compared to decisives, feel more acutely the effects of ego-depletion (Ferrari & Pychyl, 2007). After engaging in an (cognitively) effortful task, indecisives were less able to engage in self-regulatory behaviors than decisives. Other research (Trawalter & Richeson, 2006) suggested that a prevention focus may result in greater ego-depletion because of the requirements of strategic vigilance. People who reported stronger tendencies toward indecision also tend to report higher amounts of agitation-based emotions (e.g., Beswick & Mann, 1994; Hammer, 2000; Milgram & Tenne, 2000; Rassin & Muris, 2005; Spada et al, 2006), which seems related to a prevention focus (Higgins, 1998; 2001).

Figure 1 (below) shows the above-described relationship with a placeholder (“Other factors?”) for how the situation may or may not influence decisional procrastination. As the placeholder implies, it may require more than ego-depletion for decisional procrastination to occur. There may be two related ways that influence the presence or absence of decisional procrastination.

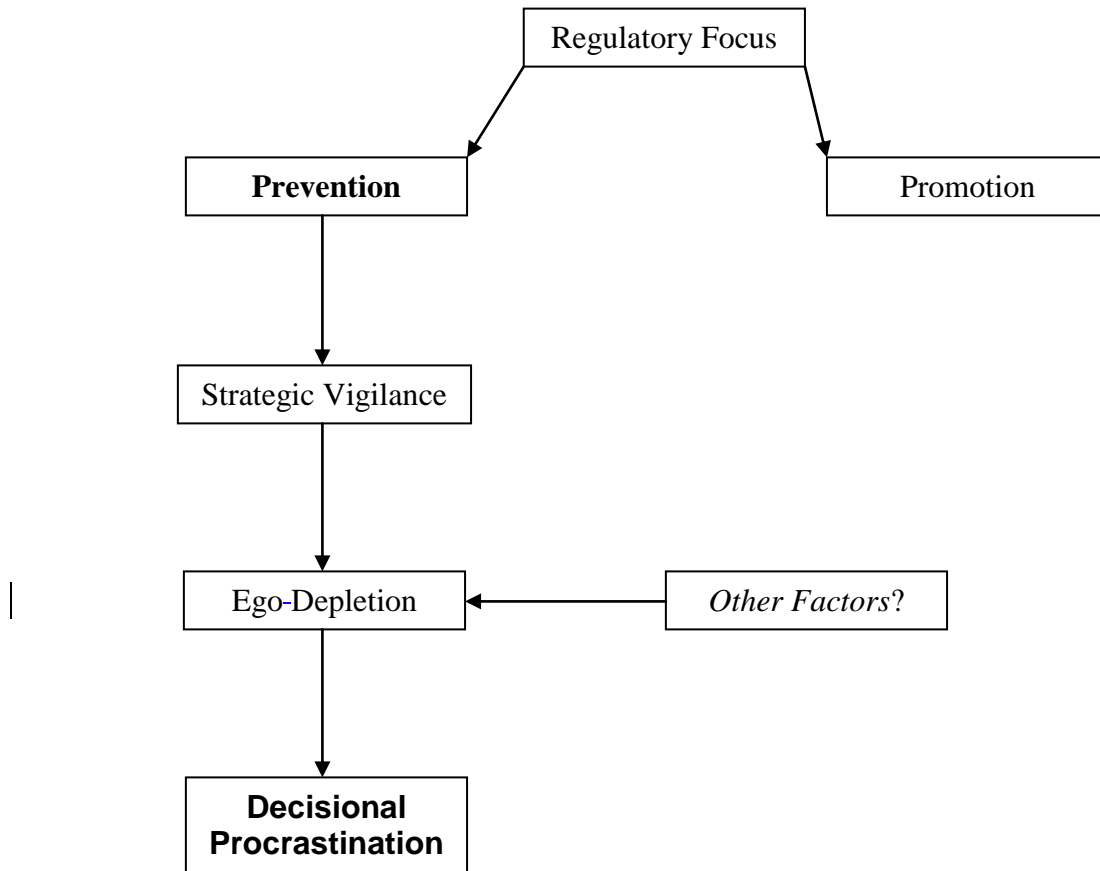


Figure 1. The basic relationship between Regulatory Focus Theory and Decisional Procrastination is shown. A chronically accessible prevention focus may lead to strategic vigilance over a long period and thus decrease self-regulatory resources, leading to ego-depletion. By itself, this may not lead to decisional procrastination; other factors may be needed to induce decisional procrastination.

Accurate decision-making also may require an input of effort (Payne et al., 1993). When the energy for effort is missing, it seems that on the average people would be less likely to engage in effortful decision-making. However, even with lower energy levels (e.g., with ego-depletion), people may still engage in effortful tasks if properly motivated (Webb & Sheeren, 2003).

One way to provide that motivation may be through Regulatory Fit processes. When a person has an active regulatory focus, engagement with a task in a way that matches their regulatory orientation may increase their motivation in the task (Higgins, 2000b). It seems likely that decision situations that primarily focus on gains versus non-gains may result in regulatory fit for people with a promotion focus while those with a prevention focus may feel less motivated to engage.

With respect to decisional procrastination, Hammer (2000) found that indecisives' search patterns changed only when they were recording their confidence to make a decision. That is, they tended to search information by alternatives rather by attributes. For decisives, recording confidence at making a decision may have acted as additional "cognitive load" in that they searched information by attribute rather by alternative (as expected from Ferrari & Dovidio, 2001). By considering their performance confidence, indecisives may have focused on risk reduction (Raghunathan & Pham, 1999). In turn, risk reduction attention may focus on loss avoidance and may have increased task's regulatory fit for indecisives.

It would seem likely that using a different question (e.g., *how eager are you to make a decision right now?*) might have a different effect (i.e., eagerness corresponds to a promotion focus; see Figure 2 for a diagram; Higgins, 1997; 1998). In this situation,

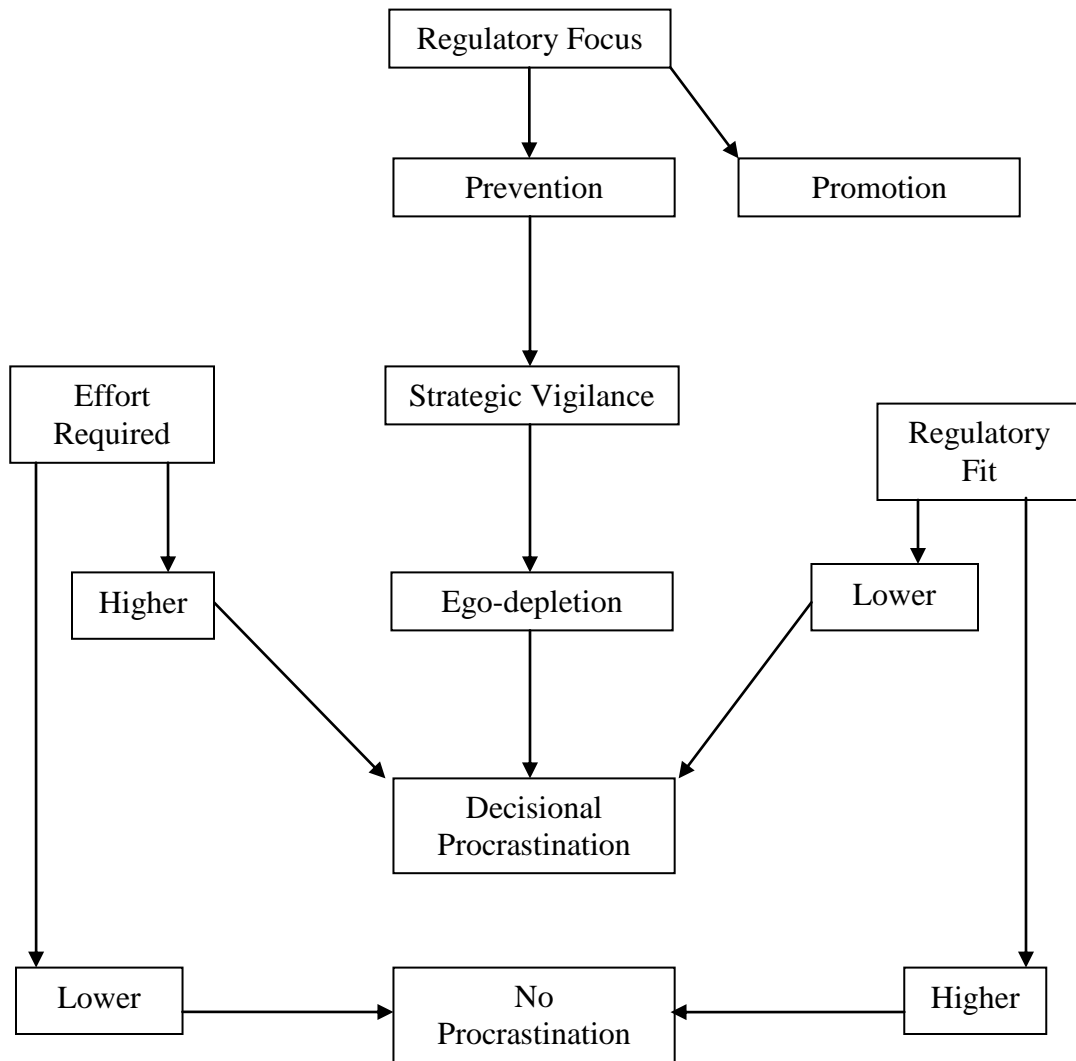


Figure 2. This diagram shows how regulatory fit and decision effort may interact. People with a promotion focus seem less likely to be affected when regulatory fit is low as they may have greater self-regulatory resources available. However, people with a prevention focus may have fewer resources available and thus when a decision would be more effortful and have lower regulatory fit strength it seems likely they would be more likely to engage in decisional procrastination.

people with a prevention focus may be more likely to engage in avoidant search strategies, consistent with previous research (Ferrari & Dovidio, 2000; 2001). Conversely, a decision situation that focuses on non-losses versus losses may be perceived as more engaging for people with a prevention focus than people with a promotion focus. Consequently, people with a promotion focus may be more likely to disengage from the decision. As they may have self-regulatory resources available (compared to indecisives), it seems unlikely they would engage in avoidant behaviors (i.e., decisional procrastination).

Another way in which Regulatory Focus may play a role in decisional procrastination processes includes coping with threats and stressors. The *Conflict Theory of Decision-Making* (Janis & Mann, 1977) suggested that decisional procrastination may occur when a decision needs to be made in the immediate time frame but there appear to be no clearly preferable options. Among the things that may deplete these resources is constantly attending to the surrounding environment for threats (Muraven & Baumeister, 2000) as people with a chronic prevention focus may do (Forster et al., 2003; Higgins, 1997, 1998; Trawalter & Richeson, 2006).

It seems important to note that motivation to engage in a task may override the effects of ego-depletion (Webb & Sheeren, 2003). This outcome implies that Regulatory Fit (Higgins, 2000b) may also play a role in coping with threats and stressors when depleted of self-regulatory resources. How a stressor or threat is framed potentially also plays a role. For example, situations framed as “loss” versus “non-loss” may increase the motivation of people with a prevention focus to engage with the decision, while framing as “gain” versus “non-gain” for people with a promotion focus may increase motivation

to engage (Higgins, 2000b). This means that the effect of ego-depletion may be moderated by motivation. It seems likely that the effect of the two components would be subject to the relevant strength of each. Where ego-depletion is stronger than the regulatory fit to the threat, it seems likely that decisional procrastination would occur. Where regulatory fit is stronger than ego-depletion, it seems likely that decisional procrastination would not occur (see Figure 3 for a diagram).

Overview of the Present Study

The present study examined how a prevention focus may lead to decisional procrastination as a result of a stressor or threat in a decision situation. Janis and Mann's (1977) *Conflict Theory of Decision-Making* provides a model in which to conceptualize the concept and research on decisional procrastination. In fact, there is a reliable and valid self-report scale on decisional procrastination based on this theory (Mann, 1982).

In order to examine the effect of regulatory focus on decisional procrastination, the present study required all participants to complete 500 trials of a Stroop Color-Word task, similar to one used in previous research on ego-depletion (e.g., Wallace & Baumeister, 2000). Participants received one of two instructions before starting the Stroop task. A random half of the participants were told they will start with zero points and gain one point per each correct answer on the Stroop task, while the other half of participants were told they would start with 500 points and lose one point for each incorrect answer. These instructions were used in the past in regulatory focus research (Idson et al., 2000) to induce promotion and prevention foci, respectively. Because indecisives were hypothesized to have a chronically available prevention focus, it was

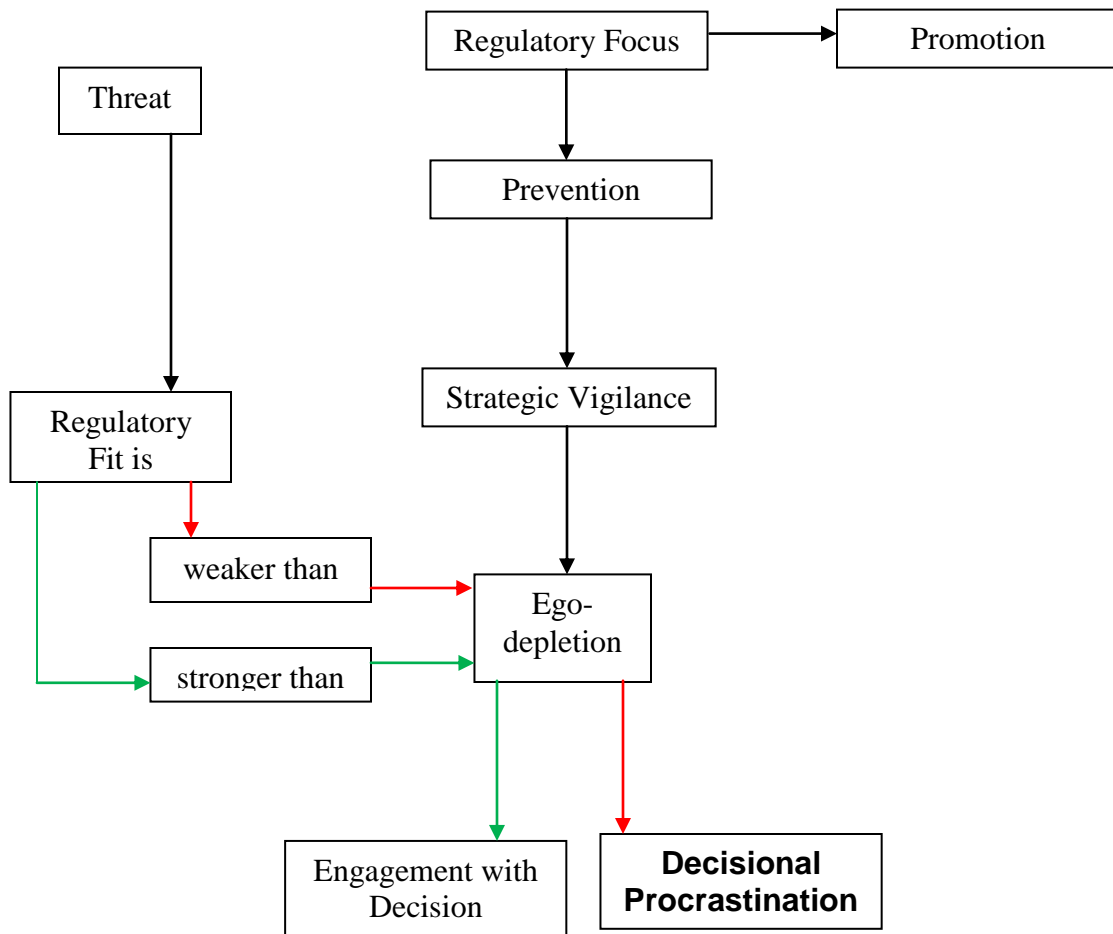


Figure 3. This diagram shows how threat, regulatory fit and prevention focus may interact. The colored arrows indicate the hypothesized relationship.

expected that “lose points” instruction would affect them more strongly than decisives. In other words, it was expected indecisives would experience greater ego-depletion than decisives.

In order to examine a “response-to-threat” condition in a decision-making situation, the present study manipulated threat level by having participants imagining they obtained their ‘dream job.’ However, before they graduated a required course with a poor instructor stood in their way. In the high threat condition, participants were told that their GPA was just above the minimum needed and they needed to pass all the courses. In the low threat condition, participants were told their GPA was enough above the minimum needed that doing in poorly in one course wouldn’t matter much. For the decision-making task, the “choosing a college course” task used in previous research (Ferrari & Dovidio, 2000, 2001; Hammer, 2000) was used. Participants were told they would be choosing a college course from among several alternatives with multiple attributes. It was presented using a computerized version of Payne’s (1975) information board accessed through the Internet and used effectively in Hammer (2000).

Overall, the design of the proposed experiment was a 2 (*Decisional Procrastination: Decisives vs. Indecisives*) by 2 (*Threat Level: Low vs. High*) by 2 (*Stroop Task Instruction: “Promotion-Gain Points for Correct Answers” vs. “Prevention-Lose Points for Incorrect Answers”*) between groups factorial.

For this experiment, the dependant variables were grouped into two general types: *temporal measurements* and *information search* measurements. The temporal measurements were prior measures used by Ferrari and Dovidio (2000; 2001) and formatted for electronic data collection. These dependent variables included: *average*

time per trial in the Stroop task, percentage correct in the Stroop task; amount of fatigue experienced from the Stroop task; perceived threat of the situation; perceived importance of the decision; total decision-making time (in seconds); average time per cell (in milliseconds); average time per cell on the non-chosen options (in ms); average time per cell on the chosen option (in ms), average time per cell (in milliseconds, the amount of the information searched overall, the amount of information searched on the chosen alternative (including reacquisitions of cells), the amount of the information searched on the non-chosen alternatives (including reacquisitions of cells), the proportion of intra-dimensional transitions to total transitions; and, the proportion of inter-dimensional transitions to total transitions.

Predicted Results

Ferrari and Dovidio (2000, 2001) found that indecisives searched less information overall plus searched more often within attributes. In a study similar to those of Ferrari and Dovidio (2000, 2001), Luce et al (1997) found that people in high negative emotion conditions may tend to engage in problem-focused and emotion-focused coping at the same time. This meant that these people may tend to search more information overall, but do so in a way described as avoidant, namely searching information by attributes to eliminate alternatives. In Luce et al's study, however, participants were not depleted of resources. If they had experienced depleted resources, it seems likely only emotion-focused coping may have occurred.

The present study expected results similar to Ferrari and Dovidio (2000; 2001). That is, the present study hypothesized that ego-depletion in indecisives would result from a chronically available prevention focus. If so, then giving indecisives a task that

induces a situational prevention focus should deplete them of self-regulatory resources faster than decisives. If subsequently placed into a threatening situation, it was expected that the more depleted indecisives would behave in a manner consistent with emotion-focused coping as per Luce et al (1997). However, in this case, it was expected that the problem-focused coping component would not occur for the indecisives who been depleted more thoroughly.

If regulatory focus played no role in chronic decisional procrastination, it was expected that the results would be similar to Luce et al (1997) in that both problem-focused and emotion-focused coping would occur based on *Regulatory Fit* to the threat level but irrespective of decisional procrastination. That is, participants who received the “lose points” instruction to induce a situational prevention focus were expected to be more motivated in the higher threat condition (and thus expend more effort to search by alternative) and less motivated in the lower threat condition (and thus tend to search by attribute). Participants in the “gain points” instruction (inducing a situational promotion focus) would then be expected to be less motivated in the high threat condition (and use more avoidant tactics).

Statement of Hypotheses

Hypothesis I: If indecisives underwent greater depletion of self-control resources in the prevention focus, a 3-way interaction was expected between decisional procrastination level, Stroop regulatory focus instruction, and threat level indicating that indecisives and decisives responded differently to regulatory focus and threat level, such that 3-way interactions would appear for amount of time searching information, amount of information searched, amount of information searched on the non-chosen option, amount of information search on the chosen option, the proportion of inter-dimensional shifts, and the proportion of intra-dimensional shifts.

Hypothesis IIa: If depletion of self-control resources was stronger than the threat presented, an ordinal two-way interaction was expected for indecisives such that those in the prevention focus-higher threat condition would display more avoidant information search behaviors than indecisives in the other conditions, specifically, indecisives were expected to make more searches within attributes rather across attributes. Indecisives were also expected to search a higher proportion of information on the chosen alternative and a lower proportion of the non-chosen alternatives when compared to decisives.

Hypothesis IIb: If the depletion of self-control resources and regulatory fit strength to the threat were equivalent, a two-way interaction between regulatory focus instruction and threat level would not be expected for indecisives regarding avoidance information search behaviors. That is, indecisives in all four conditions would respond similarly.

Hypothesis III: Decisives were expected to show a disordinal two-way interaction between Stroop task instruction and threat level such that in the low threat condition decisives who received promotion instruction were expected search more information inter-dimensionally and search less intra-dimensionally than those who received a prevention focus instruction in the Stroop Color-Word task. The converse was expected for decisives in the high threat condition.

Alternate Hypothesis: If a chronic prevention focus plays no role in decisional procrastination, a disordinal two-way interaction for all participants (regardless of decisional procrastination level) between regulatory focus instruction and threat level was expected such that in the low threat condition participants who received promotion instruction were expected search more information inter-dimensionally, search less intra-dimensionally, and search more information on the non-chosen alternatives than those who received a prevention focus instruction. The converse was expected for participants in the high threat condition.

CHAPTER II: METHODS

Participants

Participants were 376 introductory psychology students (M age = 19.0) not graduating after the current quarter, who received course credit for participating.

Psychometric Measures

Participants completed Mann's (1982) 5-item *Decisional Procrastination (DP) Scale*, designed to evaluate tendencies toward indecisiveness as a means to avoid stressful decision-making situations. This brief inventory asked respondents to complete each item along a five point Likert scale (1 = *not true for me*; 5 = *true for me*; see Appendix B for scale). Previous research has shown that scores on this scale have a high internal consistency (current alpha = .84; Effert & Ferrari, 1989, Ferrari & Dovidio, 1998; Ferrari & Dovidio, 1997; Specter & Ferrari, 2000; current alpha =; see Ferrari et al., 1995 for more information) and temporal stability (retest $r = 0.62$; Radford et al., 1986). Validity studies indicate that scores on the *DP* scale were related to scores on academic procrastination (delay on tasks related to academic performance), locus of control, forgetfulness, absentmindedness, and noncompetitiveness (see Ferrari et al., 1995; Mann et al., 1997). The *DP* scale also significantly correlates with college course planning ($r = -0.32$; Burnett et al, 1989) and career planning ($r = -0.43$), since each requires at least some amount of decision-making. There was also a significant albeit modest relationship ($r = 0.15, p < 0.05$) between indecision and academic performance (Beswick et al., 1988).

Participants completed Reynold's (1982) short form of the *Marlowe-Crowne Social Desirability (MCSD) Scale*. This inventory asked participants to respond "true" or

“false” to statements relating to their behaviors and attitudes (see Appendix C for scale). This scale has good reliability (current alpha = .78) and correlates strongly with the full Marlowe-Crowne Scale ($r = 0.93$; Reynolds, 1982). This measure was used to as a manipulation check on *DP* scale scores to determine if participants were responding in a socially desirable manner.

To measure depletion of self-control resources, the Iowa Fatigue Scale (Hartz, Bentler, & Watson, 2003) was modified to gauge the effect of the Stroop Task as resource depleting. Participants responded using a 5-point Likert scale (0 = Not at all; 5 = Extremely). The items were modified to clarify that the participants were to respond based upon how they felt at that moment (i.e., “right now”). Research indicates good internal consistency for the unmodified scale (alpha = .90; Hartz et al, 2003) while the modified scale had acceptable consistency (current alpha = .76). The scale also may be split into various subscales (cognitive fatigue, alpha = 0.36; fatigue, alpha = 0.68; energy, alpha= 0.54; productivity, alpha= 0.43). Hartz et al. (2003) tested the instrument on a clinical sample of patients who each had an illness of one symptom or outcome was fatigue. In their validation study, they found these participants reported a median score of 29.

Procedure

All experimental procedures were presented through a computerized version of Payne’s (1976) information board written in JavaScript and developed by Hammer (2000) as a reliable measure of decision-making. The use of a computerized version of the experiment enabled measurement of participants’ response times and other dependent variables for the present study with no experimenter bias.

After giving informed consent, participants completed the experiment online. The online program instructed participants on the use of the computer program as well as explaining with an example figure. Participants were instructed to carefully read all directions provided, and that once they feel they understand them, they would move onto the tasks. For example, participants were shown dummy information board and told that leftmost column provided contained the number of alternatives available and that each row represented one of the alternatives that they could choose. All other columns represented dimensions of attributes that all the alternatives shared. Participants were instructed on how to search information and make a choice when they were ready.

Participants were randomly assigned to one of four experimental conditions: a prevention focus frame where they were told they would lose points for incorrect answers on the Stroop task and a subsequent high threat decision situation (*PREVENT/HIGH*), a promotion focus frame where they were told they would gain points for correct answers on the Stroop task and a subsequent high threat decision situation (*PROMOTE/HIGH*), a prevention focus frame where they were told they would lose points for incorrect answers on the Stroop task and a subsequent low threat decision situation (*PREVENT/LOW*), a promotion focus frame where they were told they would gain points for correct answers on the Stroop task and a subsequent low threat decision situation (*PROMOTE/LOW*).

Table one (below) shows the overall design without the level of chronic indecisiveness.

Table 1

Overall Design of the Manipulations

| Threat Level | Regulatory Focus (Stroop Point Assignment) | |
|--------------|--|--------------|
| | Lose Points | Gain Points |
| Low | PREVENT/LOW | PROMOTE/LOW |
| High | PREVENT/HIGH | PROMOTE/HIGH |

Participants first completed a 500-trial Stroop color-word task, of which 115 trials had a match between the word cue and the color the word was shown in (i.e., “Blue” shown in blue). Participants were told they would see color words printed in various ink color on the screen (i.e., red, blue, green, & yellow). They were instructed to indicate the color of the ink of each word by pressing the appropriate key (“r” for red; “b” for blue; “g” for green; “y” for yellow). Half of the participants were randomly assigned to the PREVENT condition of the Stroop task. They were told they would start with 500 points and as they answer each time, points would be deducted for incorrect answers. The other half of participants were told they would start with zero points and as they answer they would receive points for correct answers (PROMOTE condition). The Stroop protocol has been used in past research on ego-depletion (Wallace & Baumeister, 2000), including with indecisives and decisives (Ferrari & Pychyl, 2007). The point assignment protocol has been used in past research on regulatory focus to emphasize promotion foci (gaining points for correct answers) or prevention goals (losing points for incorrect answers; e.g., Idson et al, 1999; Liberman et al, 1999). Prior research in regulatory focus used only manipulations to induce a promotion focus or prevention without a neutral condition (e.g., Crowe & Higgins, 1997; Higgins et al, 1997; Idson et al, 1999). After the last trial, participants completed the modified Iowa Fatigue Scale as a manipulation check measuring their current level of fatigue.

In the second half of the experiment, all groups first were asked to imagine they would be graduating the quarter after the current one. They were asked to imagine that they had managed to obtain their dream job, but that they needed to have a minimum GPA at graduation. All participants were asked further to imagine they were confident

about all the classes except one. In this class, the participants were told their friends informed them that the instructor insults students, gives surprise quizzes, the tests generally did not reflect information from the lectures or book, the instructor gave out “D’s” & “F’s” to encourage harder work later, and that the instructor seems to not know the material personally. These attributes were aggregated from the website “ratemyprofessor.com.”

In addition to this, participants in the LOW threat condition were told that they had a GPA well above the minimum needed and a low grade in any one class would not affect the job. However, participants in the HIGH threat condition were told that the job had been difficult to obtain and their GPA was just above the minimum and that they needed to do well in all their classes to keep the job. All participants then were told that the college had decided to open several other courses at the last minute to meet the graduation requirements because there are too many students who need that requirement to graduate.

Based on previous research (e.g., Jacoby et al., 1987; Ferrari & Dovidio, 2000; 2001; Hammer, 2000), participants were instructed that they could search information about several course sections and make a decision about which course section they desired the most. Additionally, they were told that they could only see information while the cursor was over it. Participants were told once they removed the cursor from a piece of information it would close though they could go back and view it again.

The task used eight rows as “alternatives” and eight columns as “attributes,” yielding a total of 64 unique pieces of information that participants could have searched. Eight alternatives were labeled as “Course A” through “Course I” (see Appendix A).

There were also eight attributes per alternative, namely: “time of the day,” “lecture length,” “class credits,” “expected work,” “class size,” “personal interest,” “book costs,” and “friends’ opinions.”

For example, in the present study the *time of day* the potential class would be offered was 8:00 A.M., 12:00 AM, or 4:00 P.M.; *lecture length* was one, two, or three hours; *class size* was small, medium, or large; *personal interest* was low, medium, or high; *class credits* were two, three, or four; *expected work* was low, medium, or high; *book costs* were \$50, \$100, or \$150; and, *friends’ opinions* were most liked, mixed, and most disliked (see Appendix B for a model of the display). A participant may have desired information about the “class credits” for “Course B”. Thus, this participant would have moved the mouse over to that cell and clicked, whereupon the participant would have seen the number of credit hours that course was worth.

As in Luce et al (1997), before moving to the decision task participants were asked two questions on a scale from 0 (Not at all) to 10 (Very): 1) “To what extent do you feel threatened by this situation?;” and 2) “To what extent do you feel this decision is important?” After answering these, participants moved on to the decision-making task. The total time spent on a task was recorded, as well as the average time spent in each cell, and which cells were searched along with the transitions made. When participants were ready to make a decision, they clicked the appropriate button at the bottom of the screen that represented the choice they preferred.

After making their choice, participants were taken to a new screen where they answered some questions about themselves and the decision task they just completed. Participants first were asked 12 questions about their mood (taken from Crowe &

Higgins, 1997) that included those related to cheerfulness (happy, upbeat, & satisfied), dejection (discouraged, sad, & disappointed), quiescence (calm, secure, & relaxed), and agitation (uneasy, tense, & worried). For each mood item, participants were asked the following question: “Please indicate on scale from 0 to 4 (where 0 means “Not at all” and 4 means “Very”), how you felt while searching information to choose a new class?” However, only the negatively valence moods were used for analysis. Those were summed into composite scores for analysis.

Finally, participants completed Mann’s (1982) 5-item, Likert scale (1 = “Not True for Me”; 5 = “True for Me”) *DP* scale and Reynold’s (1982) 13-item, true/false short form of the *MCSD* scale. Hammer (2000) found no significant performance difference between participants’ who completed the *DP* scale as part of a prescreening questionnaire and participants who completed the *DP* scale after performing an experimental decision making task. Participants in the present study then were debriefed and told the study is complete.

Primary Dependent Variables

The primary dependent performance measures in this study included: (1) total time to make a decision (in seconds); (2) average time per cell (in milliseconds-hereafter referred to as ms); (3) average time (ms) per cell on the non-chosen options; average time (ms) per cell on the chosen option; (5) proportion of intra-dimensional transitions made; (6) proportion of inter-dimensional transitions made; (7) proportion of total information searched (calculated by dividing the number of cells searched by 64); (8) proportion of cells of information searched for the alternatives that were not chosen (the number of cells searched divided by 56); (9) proportion of cells of information searched for the

alternative that was chosen (the number of cells searched divided by 8); (10) number of repeated cell searches on the non-chosen options; (11) number of repeated cell searches on the chosen option; (12) the composite agitation-related emotions score on a scale from three to twelve; (13) the composite dejection-related emotions score on a scale from three to twelve; (14) the average Stroop trial time; and, (15) percent correct on the Stroop task.

Manipulation Checks

There were three important manipulation checks administered to participants. The first was the modified Iowa Fatigue Scale. The purpose of this check was to certify differing levels of fatigue between the two regulatory focus conditions. That is, it was expected that participants in the PREVENT condition of the Stroop task would experience greater fatigue than those in the PROMOTE condition. The second manipulation check was the feeling of threat and important the participants felt about the upcoming decision after reading the description of it. Participants in the high threat condition were expected to feel more threat and that the decision had a higher importance than those in the low threat condition. The final manipulation check in this experiment was score on the short form of the MCSD scale. Though Hammer (2000) demonstrated no statistical difference in DP scores taken from a prescreening survey and DP scores taken after an experiment, the present study used the MCSD scale to examine if DP scores (and other self-report variables) were affected by social desirability concerns. The computer recorded all dependent measures taken from participants.

All dependent measures and manipulation checks were stored as Web “cookies” and emailed as a file to be stored as well as sent to an online database for downloading

later in a tab delimited format. All cookies were destroyed upon participants' completion of the experiment.

CHAPTER III: RESULTS

Initially, 641 participants completed the Stroop task, but 265 participants dropped out before completed the second (“choosing a college course”) decision-making task. There were 376 individuals (132 men, 244 women) who participated in the full experiment. Unfortunately, 169 individuals (56 men, 113 women) did not complete the tasks and/or did not follow instructions. After categorizing participants on their decisional procrastination level, preliminary analyses were conducted on the sample of 376 participants. This analysis was performed to determine if removal of the 169 individuals who did not follow instructions were significantly different than the 207 participants who completed the study and followed all directions.

Categorizing Indecisives and Decisives

All 376 participants were categorized on their decisional procrastination tendency (i.e., decisives vs. indecisives), based on a median-split of self-reported scores on Mann’s (1982) *Decisional Procrastination Scale* (DP) ($Mdn = 13.0$). No significant differences on DP scores were found between women ($M = 13.1$; $SD = 4.4$) and men ($M = 13.5$; $SD = 4.5$). Participants who scored 13 or greater on the DP scale were categorized as *indecisives* in the present study (60 men, 125 women; M score = 16.7; $SD = 2.6$). In turn, participants who scored 12 or less on the DP scale were categorized as *decisives* (72 men, 119 women; M score = 9.7; $SD = 2.7$). Table 2 shows the sample sizes of decisives and indecisives across experimental conditions.

A *chi-square analysis* was conducted to compare the 169 participants who did not follow instructions and the 207 who did to determine if there were any differences between the two groups on who was categorized as decisives and who was categorized as

Table 2

Participants by Condition

| Manipulations | Decisives | Indecisives |
|------------------------|-----------|-------------|
| Promotion Instruction | | |
| Lower Threat | 46 | 44 |
| Higher Threat | 47 | 41 |
| Prevention Instruction | | |
| Lower Threat | 45 | 49 |
| Higher Threat | 53 | 51 |

indecisives, but no significant differences were found ($\chi^2(1, N = 376) = 0.000, p < 0.98$).

Preliminary Analyses

The Stroop Color-Word Task contained 115 trials where the word clue and the color context were in concordance (i.e., “Blue” shown in blue typeface). For 87 participants, their percentage correct on the Stroop Task matched the number of times the word clue and color context were in concordance. This result indicated that they were reporting the word rather than the color of the word as instructed; consequently, the resource depletion may not have been as strong for these individuals.

In addition, another 82 participants did not search at least one cell of the non-chosen alternative and at least one cell of the chosen alternative. Because these respondents did not follow instructions or complete the task, preliminary analyses were conducted to examine if those 169 individuals (called “removed”) differed significantly from the other 207 participants (considered “retained”) on manipulation membership, gender, *DP* score, *MCSD* score, and *IF* score.

A *chi-square analysis* was conducted between those who followed instructions (Retained) and those who didn't (Removed) on membership in each manipulation (Stroop Instruction and Threat Level) and gender. Table 3 shows these results. There also appears to be no significant differences between those who would be retained and those who would be removed for membership in the manipulations and gender. Finally, a *one-way MANOVA* using retention as a between groups factor and *DP*, *MCSD*, and *IF* subscale scores as dependent measures yielded no significant differences, $F(9, 356) = 1.07, p < 0.38$. Because there seems to be little evidence that the retained and removed participants differed in regards to gender, self-report scales, and membership in the manipulations, it was decided that it was appropriate to remove individuals who failed to follow instructions or complete all measures from any further analyses (see Table 4 for sample sizes by condition).

Manipulation Checks

There were three manipulation checks used in the present study. The first manipulation related to the self-report measures. That is, two concerns were that time period in a academic quarter might be related to when participants' decisional procrastination scores or social desirability tendencies might lead participants to misreport in socially appropriate ways on Mann's (1982) *Decisional Procrastination* scale (DP) and the *Iowa Fatigue Scale* (IF; Hartz et al., 2003). The short form of the *Marlowe-Crown Social Desirability Scale* (MCSD; Reynolds, 1982) examined this potential confound. Table 5 shows all zero-order intercorrelations. The day of the quarter in which participants completed the experiment were not related in any way to the self-

Table 3

Count of Retained and Removed Data by Stroop Instruction, Threat Level, and Gender

| | Retained | Removed |
|---------------------------------|----------|---------|
| Stroop Instruction ¹ | | |
| Promotion | 103 | 75 |
| Prevention | 104 | 94 |
| Threat Level ² | | |
| Low | 102 | 83 |
| High | 105 | 87 |
| Gender ³ | | |
| Male | 76 | 55 |
| Female | 131 | 106 |

¹ $\chi^2(1, N = 376) = 1.47, p < .23$

² $\chi^2(1, N = 376) = 0.02, p < .90$

³ $\chi^2(1, N = 376) = 0.92, p < .34$

Table 4.

Final Sample Sizes by Condition

| Manipulations | Decisives | Indecisives |
|------------------------|-----------|-------------|
| Promotion Instruction | | |
| Lower Threat | 26 | 23 |
| Higher Threat | 28 | 26 |
| Prevention Instruction | | |
| Lower Threat | 24 | 29 |
| Higher Threat | 28 | 23 |

$n = 207$

Table 5

Zero-order Correlates Among Self-Report Scales

| | 1 | 2 | 3 | 4 |
|---|----|--------|--------|-------|
| 1) Marlowe Crown Social Desirability Scale (MCSD) | -- | -.262* | -.286* | -.031 |
| 2) Mann's Decisional Procrastination Scale (DPS) | | -- | .093 | -.003 |
| 3) Iowa Fatigue Scale (IFS) | | | -- | -.043 |
| 4) Quarter Day ¹ | | | | -- |

$n = 207$; * $p < 0.001$

¹Data collection occurred between late May 2007 and March 2008. Quarter day counts the number of days from the start of any quarter where data was collected.

report measures. There also was no significant correlation between the *DP* scale and *IF* scale, but there was a significant correlation for *MCSC* scale with both the *DP* scale and the *IF* scale. This suggested that social desirability influenced participants' responses to the other scales. In this case, higher social desirability may have lead people to report lower scores on the decisional procrastination and fatigue scales. Consequently, the *MCSD* scores were included in subsequent analyses as a covariate.

The second manipulation check was the inclusion of a fatigue scale to measure the effect of the Stroop Task on a depletion of resources available for self-regulation. The present study found a median score of 34 on the *IF* scale, but in Hartz et al. (2003), a median score of 29 was found for patients suffering from diseases with fatigue as a symptom or result. This suggested that there was fatigue among participants overall. However, the present study predicted that there would be greater ego-depletion by indecisives when given a situational prevention focus.

A 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA* (controlling for social desirability) was conducted using as dependent measures the percent of correctly answered Stroop trial, average time per trial, and the *IF* scores. No significant main effects were found, but there was a significant interaction of Stroop Instruction with Decisional Procrastination Level (see Table 6 for results). It should be noted that even when the above analysis was conducted without a covariate (i.e., controlling for social desirability) the pattern of significances remained similar (i.e., only the interaction was significant).

Univariate analyses revealed that no one dependent measure was statistically significant for the interaction between Stroop Instruction and Decisional Procrastination

Table 6

Multivariate Analysis of Variance of Stroop Task

| Source | <i>Pillai's Trace</i> | <i>Hypothesis df</i> | <i>Error df</i> | <i>F</i> |
|--|-----------------------|----------------------|-----------------|----------|
| Marlowe Crown Social Desirability Scale | .080 | 3 | 200 | 5.78** |
| Stroop Regulatory Focus Instruction (RF) | .001 | 3 | 200 | 0.047 |
| Decisional Procrastination (DP) | .000 | 3 | 200 | 0.029 |
| RF*DP | .055 | 3 | 200 | 3.88* |

* $p < 0.01$; ** $p < 0.001$

Level, but there was a difference approaching significance for the total percent correct (see Table 7). Because there was no dependent measure that showed a univariate significant difference, series of 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Decisional Procrastination: Low vs. High) *MANCOVAs* (controlling for social desirability) was conducted using as dependent measures the percent of correctly answered Stroop trial, average time per trial, and the *IF* scores with each measure removed in turn (Table 8 shows the results).

The *MANCOVA* analyses revealed the test statistics decreased when the overall percent correct and mean time per trial were removed, but not when the *IF* scores were removed. This indicated that the overall percent correct and mean time per trial contributed to most of the variance in the full *MANCOVA* analysis. Table 9 shows the means for overall percent correct and mean time per trial by Stroop instruction and

Table 7

Univariate Components of Stroop Instruction and Decisional Procrastination Level

Interaction

| Dependent Measures | <i>df</i> | <i>MS</i> | <i>F</i> |
|--------------------------|-----------|-----------|----------|
| Overall Percent Correct | 1 | 0.079 | 3.60* |
| Mean Time Per Trial | 1 | 218609 | 17.3 |
| Iowa Fatigue Scale Score | 1 | 53.8 | 3.11 |
| Error | | | |
| Percent Correct | 202 | 0.022 | -- |
| Mean Time Per Trial | 202 | 104461 | -- |
| Iowa Fatigue Scale Score | 202 | 43.8 | -- |

* $p < 0.06$

Table 8

Two-way Interaction Results for Stroop Task *MANCOVAs* with Successive Removal of

Dependent Measures

| Source | <i>Pillai's Trace</i> | <i>Hypothesis df</i> | <i>Error df</i> | <i>F</i> |
|--------------------------|-----------------------|----------------------|-----------------|----------|
| All 3 Measures | .055 | 3 | 200 | 3.88 |
| Percent Correct Removed | .016 | 2 | 201 | 1.64 |
| Mean Time/Trial Removed | .023 | 2 | 201 | 2.42 |
| <i>IF</i> Scores Removed | .050 | 2 | 201 | 5.24 |

Table 9

Mean Time per Trial and Overall Percent Correct by Stroop Instruction and Decisional Procrastination Level

| | Overall Percent Correct | Mean Time/ Trial (msec) |
|------------------|----------------------------|----------------------------|
| Promotion Focus | | |
| Decisives | 0.89 (.17) | 1131 (440) |
| Indecisives | 0.93 (.12) | 1064 (250) |
| Prevention Focus | | |
| Decisives | 0.93 (.14) | 1058 (252) |
| Indecisives | 0.89 (.16) | 1122 (300) |

Values in parentheses are standard deviations.

decisional procrastination level.

Decisives who received a prevention focus instruction had a higher percent correct and lower mean time per trial than decisives who received a promotion focus. Indecisives who received a promotion focus had a higher percent correct and lower mean time per trial than those who received a prevention focus. This suggests there was an effect (modest as it may be) of Stroop Instruction on how indecisives and decisives behaved in the *Stroop Color Word Task*, but it was not as predicted. This suggested that other factors also influenced participant behavior.

The third manipulation check was the perceived threat of the situation and the perceived importance of upcoming decision. Using questions taken from Luce et al. (1997), participants responded 10-point scale regarding the perceived threat and importance. Perceived threat and importance were measured to make sure the higher threat level was threatening to participants. Luce et al. (1997) found that higher levels of negative affect increased both the threat and importance of a decision. As the perceived threat and importance items occurred after the threat level manipulation, it seemed relevant to analyze them at the same time as the main analysis.

Then, a 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (DP: Low vs. High) *MANCOVA* (controlling for social desirability) analysis was conducted using perceived threat, perceived importance, total time to make a decision, average time per cell, average time searching non-chosen options, average time searching chosen option, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including re-acquisitions), information searched on the non-chosen options (including re-

acquisitions), and information searched on the chosen option (including re-acquisitions) as the dependent measures.

A significant main effect, $F(10, 189) = 2.57, p < 0.01$, for Threat Level was found in the *MANCOVA*. Univariate results for Threat Level showed that only perceived threat and perceived importance have a significant main effect (see Table 10). Participants in the higher threat condition report higher perceived threat ($M = 8.0; SD = 2.3$) compared to participants in the lower threat condition ($M = 7.2; SD = 2.6$). Likewise, participants in the higher threat condition report higher perceived importance ($M = 8.9; SD = 1.6$) compared to participants in the lower threat condition ($M = 7.8; SD = 2.3$). These results suggested that the threat manipulation functioned as planned.

Main Analysis

Despite a lack of effect for the interaction between Stroop Instruction and Decisional Procrastination Level, the median score for the *IF* scale suggested that fatigue had occurred for participants overall (when compared against the median score reported by Hartz et al., 2003). Consequently, the main analyses proceeded.

Hypothesis 1: If indecisives underwent greater depletion of self-control resources in the prevention focus, a 3-way interaction was expected between decisional procrastination level, regulatory focus instruction, and threat level indicating that indecisives and decisives responded differently to regulatory focus and threat level, such that 3-way interactions would appear for amount of time searching information, amount of information searched, amount of information searched on the non-chosen option, amount of information search on the chosen option, the proportion of inter-dimensional shifts, and the proportion of intra-dimensional shifts.

Table 10

Univariate Components of Main Effect for Threat Level

| Dependent Measures | <i>df</i> | <i>MS</i> | <i>F</i> |
|--|-----------|-----------|----------|
| Perceived Threat | 1 | 47.619 | 8.54* |
| Perceived Importance | 1 | 63.215 | 17.3** |
| Total Time | 1 | 13739 | 3.11 |
| Average Time per Cell | 1 | 40458 | 0.268 |
| Average Time per Cell on Non-chosen | 1 | 33158 | 0.202 |
| Average Time per Cell on Chosen | 1 | 56322883 | 1.41 |
| Proportion of Inter-dimensional Shifts | 1 | .076 | 1.48 |
| Proportion of Intra-dimensional Shifts | 1 | .100 | 1.89 |
| Total Number of Cells Searched | 1 | 1597.315 | 1.59 |
| Number of Non-chosen Cells Searched | 1 | 740.321 | 1.09 |
| Number of Chosen Cells Searched | 1 | 162.756 | 3.18 |
| Error | (199) | (5.96) | -- |

* $p < 0.01$ ** $p < 0.005$

To test Hypothesis 1, a 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA*, controlling for social desirability, was performed. The dependent variables in this analysis were perceived threat, perceived importance, total time to make a decision, average time per cell, average time searching non-chosen options, average time searching chosen option, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including reacquisitions), information searched on the non-chosen options (including reacquisitions), and information searched on the chosen option (including reacquisitions). Results are shown in Table 11. As expected, the only significant effect (outside of the main effect for Threat Level) was the interaction between Stroop Instruction, Threat Level, and Decisional Procrastination. It should be noted that the removal of the covariate (i.e., controlling for social desirability) does not change the pattern of significances.

It should be noted that response shifts occurring on the diagonal were disincluded from the analysis in order to make the proportion of inter-dimensional and intra-dimensional shifts independent from one another (i.e., the measures do not sum to 1.0). When the diagonal shifts were included as a separate dependent measure, the pattern of significances in the *MANCOVA* remained the same. The mean number of diagonal shifts was 4.5 ($SD = 4.1$), ranging between 0 ($n = 30$) and 21 ($n = 2$).

An analysis of the univariate components indicated that the multivariate results are due to interactive effects for the proportion of inter-dimensional shifts and the proportion of intra-dimensional shifts (see Table 12). Figures 4 and 5 depict the interaction between Stroop Instruction, Threat Level and Level of Decisional

Table 11

Multivariate Analysis of Covariance on Perceived Threat, Perceived Importance, and
Primary Dependent Measures

| Source | <i>Pillai's Trace</i> | <i>Hypothesis df</i> | <i>Error df</i> | <i>F</i> |
|--|-----------------------|----------------------|-----------------|----------|
| Marlowe Crown Social Desirability Scale | 0.060 | 10 | 189 | 1.44 |
| Stroop Regulatory Focus Instruction (RF) | 0.061 | 10 | 189 | 1.30 |
| Decisional Procrastination (DP) | 0.078 | 10 | 189 | 1.03 |
| Threat Level (THRT) | 0.107 | 10 | 189 | 2.57** |
| RF*DP | 0.071 | 10 | 189 | 1.61 |
| RF*THRT | 0.074 | 10 | 189 | 1.76 |
| DP*THRT | 0.015 | 10 | 189 | 0.489 |
| RF*THRT*DP | 0.103 | 10 | 189 | 2.28* |

* $p < 0.02$ ** $p < 0.01$

Table 12

Univariate Components of the 3-Way MANOVA Interaction

| Source/Dependent Measures | <i>df</i> | <i>MS</i> | <i>F</i> |
|--|-----------|-----------|----------|
| Perceived Threat | 1 | 6.766 | 1.21 |
| Perceived Importance | 1 | 1.197 | 0.328 |
| Total Time | 1 | 8.942 | 0.002 |
| Average Time per Cell | 1 | 235903 | 1.56 |
| Average Time per Cell on Non-chosen | 1 | 286249 | 1.75 |
| Average Time per Cell on Chosen | 1 | 3337831 | 0.083 |
| Proportion of Inter-dimensional Shifts | 1 | .260 | 5.07* |
| Proportion of Intra-dimensional Shifts | 1 | .452 | 8.53** |
| Total Number of Cells Searched | 1 | 1.274 | 0.001 |
| Number of Non-chosen Cells Searched | 1 | 58.185 | 0.086 |
| Number of Chosen Cells Searched | 1 | 42.237 | 0.825 |

* $p < 0.05$ ** $p < 0.01$

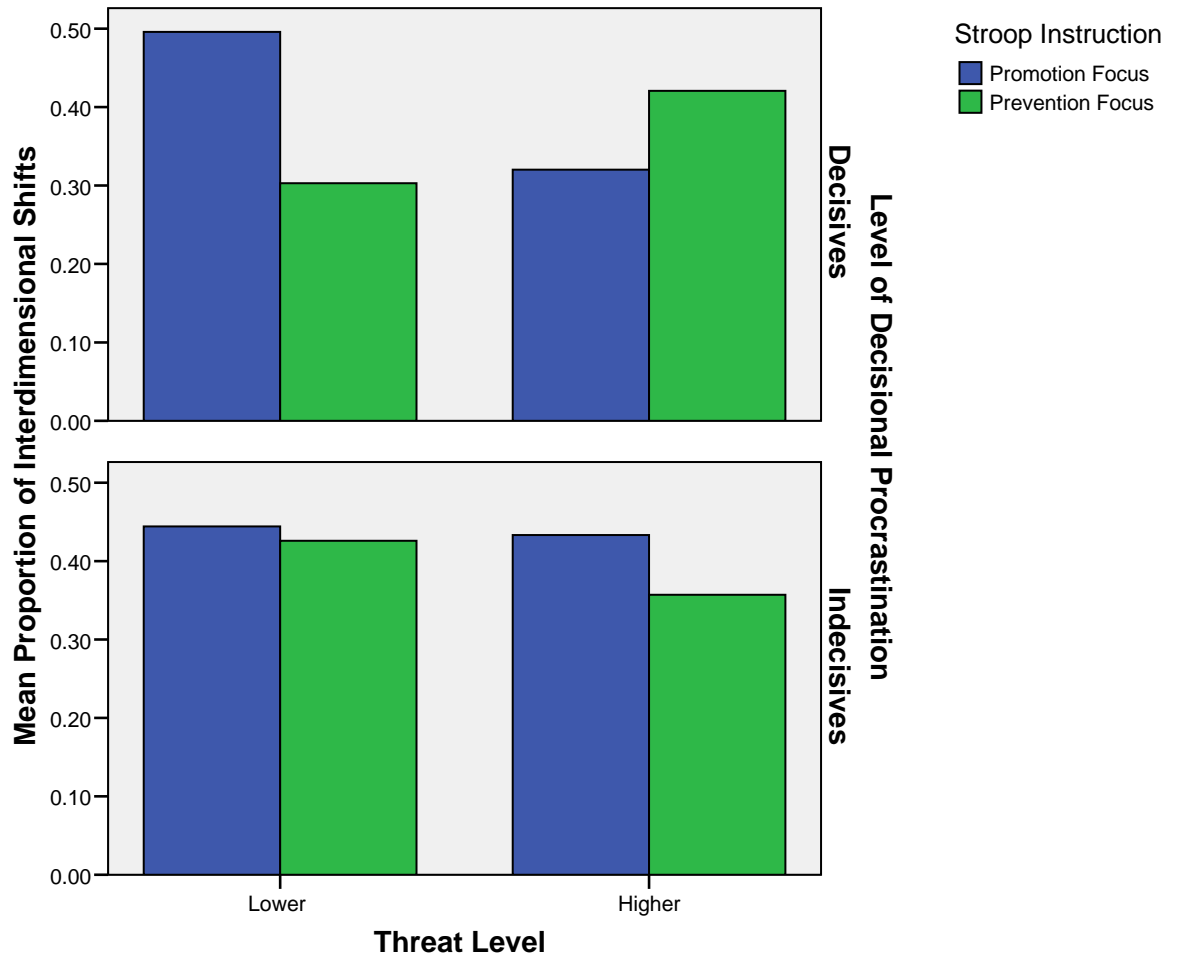


Figure 4. The mean proportion of inter-dimensional shifts is shown by level of decisional procrastination, threat level, and Stroop instruction.

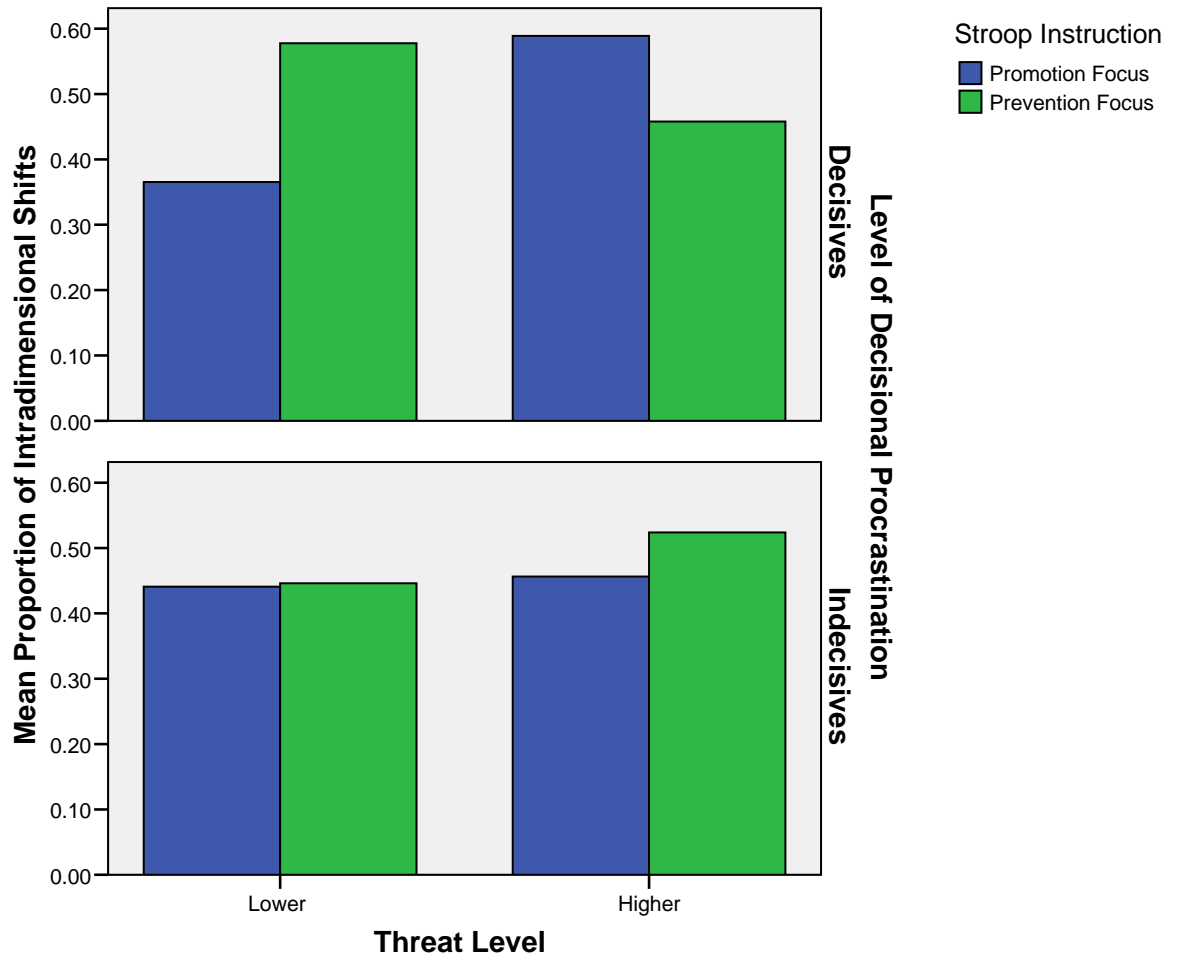


Figure 5. The mean proportion of intra-dimensional shifts is shown by level of decisional procrastination, threat level, and Stroop instruction.

Procrastination. Based on the figures, there were significant disordinal interactions between Stroop Instruction and Threat Level for inter- and intra-dimensional shifts with decisives. That is, decisives who received a promotion instruction in the Stroop task made proportionately more inter-dimensional shifts in the low threat condition compared the high threat condition, but decisives who received prevention instruction appear to have made proportionately more inter-dimensional shifts in the high threat condition compared to those in the low threat condition.

Furthermore, decisives who received a promotion instruction in the Stroop task made proportionately more intra-dimensional shifts in the high threat condition compared the low threat condition, but decisives who received prevention instruction appear to have made proportionately more intra-dimensional shifts in the low threat condition compared to those in the high threat condition. For indecisives there appeared to be an ordinal interaction between the two manipulations. That is, there was no significant difference in how indecisives who received a promotion instruction in the Stroop task search information between lower and higher threat levels (i.e., the proportion of inter- and intra-dimension shifts appeared to be similar), but indecisives who received a prevention instruction appear to have made proportionately fewer inter-dimensional shifts and proportionately more intra-dimensional shifts in the high threat condition, compared to the low threat condition.

Hypothesis IIa: If depletion of self-control resources was stronger than the threat presented, an ordinal two-way interaction was expected for indecisives such that those in the prevention focus-higher threat condition would display more avoidant information search behaviors than indecisives in the other conditions, specifically, indecisives were

expected to make more searches within attributes rather across attributes. Indecisives were also expected to search a higher proportion of information on the chosen alternative and a lower proportion of the non-chosen alternatives when compared to decisives.

Hypothesis IIb: If the depletion of self-control resources and regulatory fit strength to the threat were equivalent, a two-way interaction between regulatory focus instruction and threat level would not be expected for indecisives regarding avoidance information search behaviors. That is, indecisives in all four conditions would respond similarly.

To examine Hypothesis II a and b, the simple effects of a 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) MANCOVA (controlling for social desirability) with perceived threat, perceived importance, total time to make a decision, average time per cell, average time searching non-chosen options, average time searching chosen option, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including reacquisitions), information searched on the non-chosen options (including reacquisitions), and information searched on the chosen option (including reacquisitions) as dependent measures was examined within Indecisives. However, the interactive effect of Stroop Instruction and Threat Level within Indecisives was non-significant for the proportion of inter-dimensional shifts, $F(1, 201) = 0.152, p < 0.70$, and intra-dimensional shifts, $F(1, 201) = 0.172, p < 0.67$.

Hypothesis III: Decisives were expected to show a disordinal two-way interaction between Stroop task instruction and threat level such that in the low threat condition

decisives who received promotion instruction were expected search more information inter-dimensionally and search less intra-dimensionally than those who received a prevention focus instruction in the Stroop Color-Word task. The converse was expected for decisives in the high threat condition.

To examine Hypothesis III, the simple effects of a 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA* (controlling for social desirability) with perceived threat, perceived importance, total time to make a decision, average time per cell, average time searching non-chosen options, average time searching chosen option, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including reacquisitions), information searched on the non-chosen options (including reacquisitions), and information searched on the chosen option (including reacquisitions) as dependent measures was examined within Decisives. The interaction of Stroop Instruction with Threat Level within Decisives for the proportion of inter-dimensional shifts was significant, $F(1,201) = 10.0, p < 0.002$, as were Intra-dimensional Shifts, $F(1, 201) = 12.9, p < 0.0005$, suggesting that decisives' behaviors depended on their assigned condition.

Decisives who received a promotion focus instruction made a significantly higher, $F(1, 200) = 7.32, p < 0.00$, proportion of inter-dimensional shifts in the lower threat condition ($M = 0.50, SD = 0.26$) than in the higher threat condition ($M = 0.32, SD = 0.23$). At the same time, decisives who received a prevention focus instruction made a higher proportion of inter-dimensional shifts in the higher threat condition ($M = 0.42, SD = 0.24$) than in the lower threat condition ($M = 0.30, SD = 0.26$) that approached

significance, $F(1, 200) = 3.16, p < 0.08$. Decisives who received a promotion focus instruction made a significantly higher, $F(1, 200) = 11.2, p < 0.001$, proportion of intra-dimensional shifts in the higher threat condition ($M = 0.59, SD = 0.23$) than in the lower threat condition ($M = 0.37, SD = 0.26$). At the same time, decisives who received a prevention focus instruction made a higher proportion of intra-dimensional shifts in the lower threat condition ($M = 0.58, SD = 0.28$) than in the higher threat condition ($M = 0.46, SD = 0.26$) that approached significance, $F(1, 200) = 3.07, p < 0.08$.

Alternate Hypothesis: If a chronic prevention focus plays no role in decisional procrastination, a disordinal two-way interaction for all participants (regardless of decisional procrastination level) between regulatory focus instruction and threat level was expected such that in the low threat condition participants who received promotion instruction were expected search more information inter-dimensionally, search less intra-dimensionally, and search more information on the non-chosen alternatives than those who received a prevention focus instruction. The converse was expected for participants in the high threat condition.

The same 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) MANCOVA (controlling for social desirability) that was conducted for the Hypothesis I served to examine the Alternate Hypothesis. The dependent measures remained perceived threat, perceived importance, total time to make a decision, average time per cell, average time searching non-chosen options, average time searching chosen option, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including reacquisitions), information searched on the non-chosen options

(including reacquisitions), and information searched on the chosen option (including reacquisitions). Table 11 shows that the interaction between Stroop Instruction and Threat Level was not statistically significant.

Follow-Up Analyses

Figures 4 and 5 indicated that there was a slight difference for indecisives who received a prevention focus instruction in the higher threat condition. The *DP* scale scores ranged from 5 to 25 (a participant who answered the equivalent of all 3 would have had a score of 15). It seemed possible that participants whose *DP* scores were in the middle of the scale obscured the results of participants who reported more extreme scores. Consequently, a series of follow-up analyses were conducted to examine if removing the middle third of scores would show significant differences for indecisives as predicted by Hypothesis II.

Participants were re-categorized on their decisional procrastination tendency (i.e., decisives vs. indecisives) was calculated based on a three-way split of self-reported scores on Mann's (1982) *Decisional Procrastination Scale* (DP). Participants who scored 15 or greater on the *DP* scale were categorized as extreme indecisives in the present study (18 men, 40 women; M score = 18.8; SD = 2.5). In turn, participants who scored 12 or less on the *DP* scale were categorized as decisives (26 men, 38 women; M score = 8.3; SD = 2.0). Table 13 shows the sample sizes of decisives and indecisives across experimental conditions.

First, the manipulation checks were revisited. There remained a significant correlation between the DPS and MCS ($r = -0.33$, $n = 122$), suggesting that social desirability played a role in responses on the DPS. Subsequent to this, a 2 (Stroop

Table 13.

Participants by Condition in the Follow-Up Analysis

| Manipulations | Decisives | Indecisives |
|---------------|-----------|-------------|
| Promotion | | |
| Lower Threat | 17 | 14 |
| Higher Threat | 18 | 10 |
| Prevention | | |
| Lower Threat | 12 | 18 |
| Higher Threat | 17 | 16 |

$n = 122$

Instruction: Promotion vs. Prevention) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA* (controlling for social desirability) was conducted using percent of correctly answered Stroop trial, average time per trial, and the *IF* score as dependent measures was conducted to evaluate fatigue and performance on the Stroop Task.

There were no significant main effects, but there was a significant interaction, $F(3, 115) = 4.16; p < 0.001$, on the *MANCOVA* between Stroop Instruction and Decisional Procrastination Level. Analysis of the univariate components revealed that there was an interactive effect for the Percentage of Correct Answers, $F(1, 117) = 5.04, p < 0.05$, and an interactive effect that approached significance for the *IF* scores, $F(1, 117) = 3.04, p < 0.09$.

Table 14 shows the means for each dependent measure in the analysis. It appeared that decisives given a prevention instruction scored a higher percent correct on the Stroop task compared to those given a promotion instruction (as expected under

Table 14

Means of Dependent Measures in the Follow-Up Stroop Task Analysis

| Dependent Measures | Promotion Instruction | | Prevention Instruction | |
|---------------------|-----------------------|----------------|------------------------|----------------|
| | Decisives | Indecisives | Decisives | Indecisives |
| Percent Correct | 88.5 (16.2) | 93.8 (11.5) | 94.9 (7.85) | 89.1 (17.0) |
| Ave. Time Per Trial | 1071 (238) | 1063 (221) | 1063 (197) | 1106 (334) |
| IFS Score | 32.9 (7.0) | 37.0 (6.4) | 34.8 (7.7) | 34.2 (6.6) |

Values in parentheses are standard deviations.

Regulatory Focus theory). Indecisives appeared to have scored a higher percentage correct when given a promotion instruction compared to when they were given a prevention instruction, contrary to what Regulatory Focus theory would predict. While it remains unclear if there might be an interactive effect for the *IF* scores, it appeared that indecisives reported a higher score with a promotion focus instruction than with a prevention focus instruction while decisives reported only a slight increase in their mean *IF* score.

A *MANCOVA* analysis requires that the *n* per cell exceed the number of dependent measures by at least one. However, the present study possesses 11 measures in total for this analysis. In order to meet the parameters of the analysis, therefore, the average time per cell for the non-chosen option and for the chosen option were removed. Subsequently, a 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA*

(controlling for social desirability) was performed using perceived threat, perceived importance, total time to make a decision, average time per cell, proportion of inter-dimensional shifts, proportion of intra-dimensional shifts, total amount of information searched (including reacquisitions), information searched on the non-chosen options (including reacquisitions), and information searched on the chosen option (including reacquisitions) as the dependent measures to reexamine perceived threat and perceived importance as manipulation checks as well as to examine the hypotheses.

In this analysis, a significant main effect was found for Level of Decisional Procrastination, $F(7,107)=2.79, p < 0.02$. Analysis of the univariate components revealed perception of threat as the only statistically significant measure, $F(1,113) = 11.6, p < 0.001$. Indecisives ($M = 8.5, SD=2.1$) reported greater perception of threat compared to decisive ($M = 7.0, SD=2.7$). The only other significant multivariate effect was for the interaction between Stroop Instruction, Threat Level, and Decisional Procrastination, $F(7, 107)=2.39, p < 0.03$. An analysis of the univariate components revealed significant interactive effects for inter-dimensional shifts, $F(1, 113)=9.70, p < 0.002$, and intra-dimensional shifts, $F(1, 113)=9.70, p < 0.002$. Figures 6 and 7 depict the interactions.

Hypothesis IIa and Hypothesis IIb were reexamined using the simple effects of the 2 (Stroop Instruction: Promotion vs. Prevention) by 2 (Threat Level: Lower vs. Higher) by 2 (Decisional Procrastination: Low vs. High) *MANCOVA*. The interaction of Stroop Instruction with Threat Level within Decisives for Inter-dimensional Shifts showed a significant difference, $F(1, 116) = 4.43, p < 0.04$, as do Intra-dimensional Shifts, $F(1, 116) = 8.08, p < 0.005$. Though Figures 6 and 7 indicate a potentially

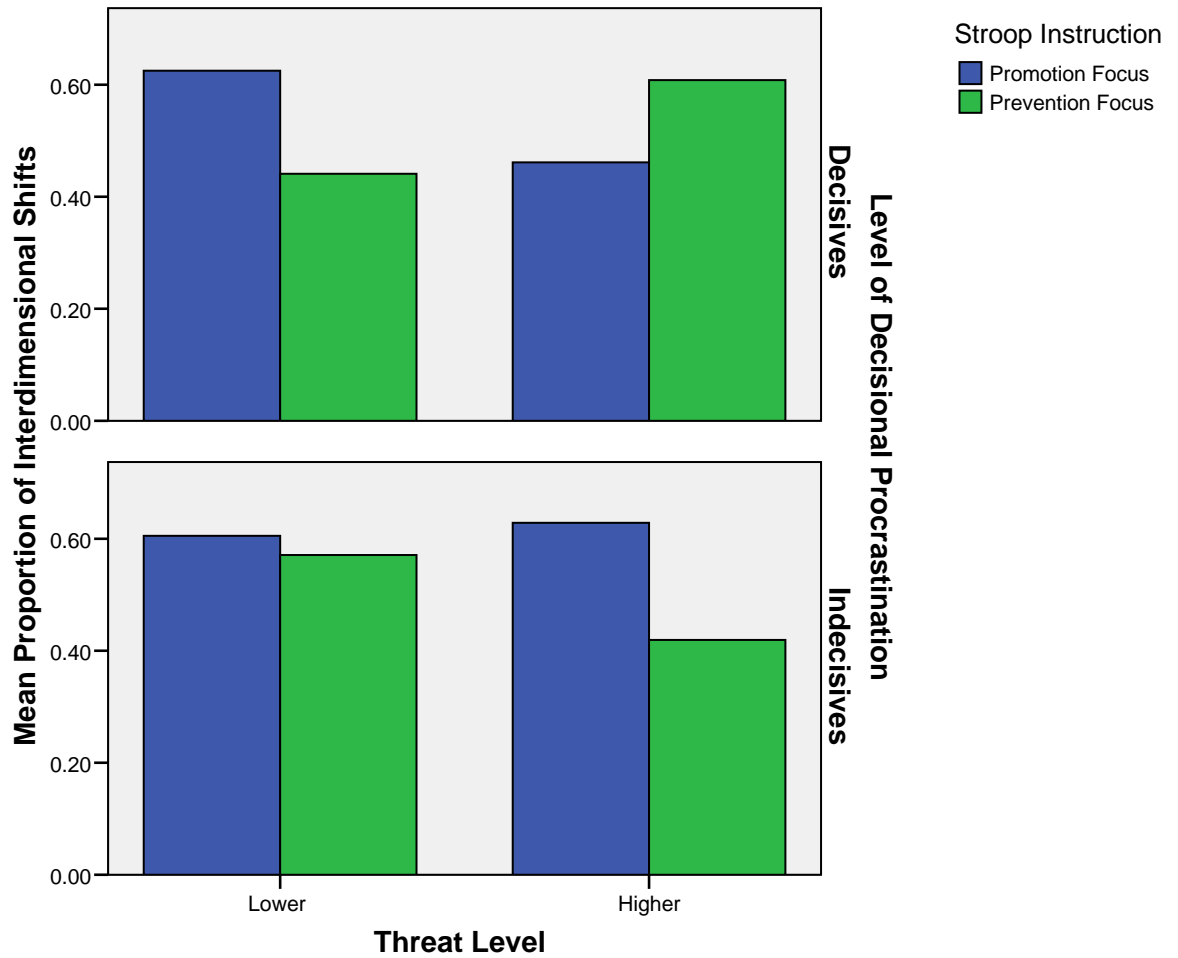


Figure 6. Proportion of inter-dimensional shifts by Level of Decisional Procrastination, Stroop Instruction, and Threat Level when middle DP scores are removed.

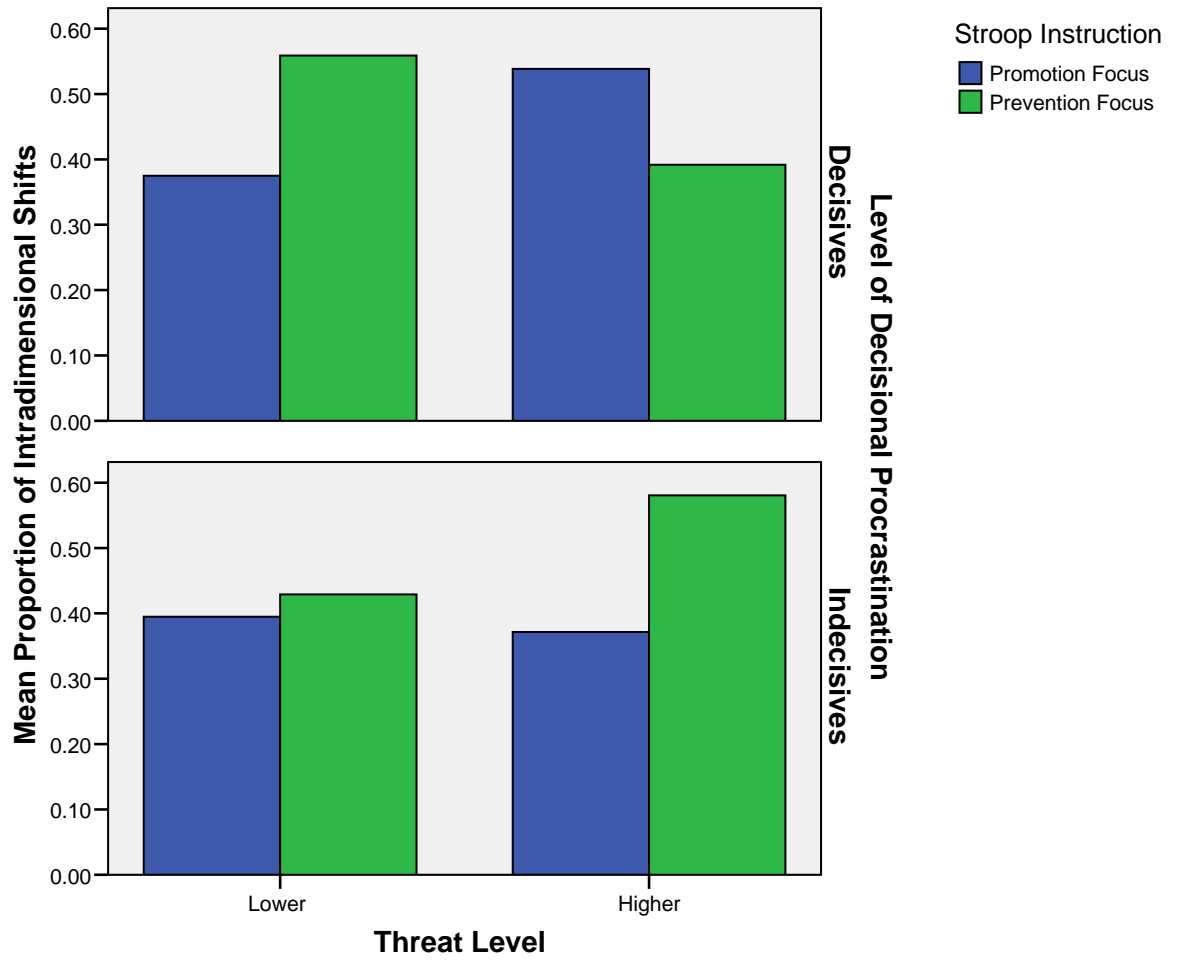


Figure 7. Proportion of inter-dimensional shifts by Level of Decisional Procrastination, Stroop Instruction, and Threat Level when middle DP scores are removed.

significant interaction, the interactive effect of Stroop Instruction and Threat Level with Indecisives only approached significance for the proportion of inter-dimensional shifts, $F(1, 116) = 2.67, p < 0.07$, and was non-significant intra-dimensional shifts, $F(1, 116) = 2.00, p < 0.11$. However for indecisives, the sample size of the cells for indecisives was low.

This follow-up analysis found similar results to the main analysis, in that the pattern of significances did not change. That is, the effects that were statistically significant remained so and those that were not significant remained so. However, the figures show clear numerical changes that may have been significant had there been more sample size in each condition.

CHAPTER IV: DISCUSSION

The present study examined decisional procrastination within the context of coping with environmental, situational threats. Prior research (e.g., Ferrari & Dovidio, 2007) found that individuals identified as indecisives, compared to decisives, may become more ego-depleted during tasks requiring a vigilance task (e.g., Stroop tasks). The present study hypothesized that one potential cause for ego-depletion may be a *prevention focus* (Higgins, 1997; 1998), such that more self-regulatory resources are spent searching the environment for potential losses (with the goal of avoiding them). In fact, one study (Trawalter & Richeson, 2006) provided a direct link between ego-depletion and prevention foci. In line with Janis and Mann's (1977) decision making theory, the present study examined decisional procrastination as a function of ego-depletion resulting from a prevention focus and the presence of a threat.

It was expected (Hypotheses I and II) that the Stroop Instruction (either *promotion focus* or *prevention focus*) would influence decisives and indecisives to behave differently in situations of threat. It was expected that the indecisives would respond by showing greater fatigue in the Prevention Focus condition. Results indicated that there appeared to be no significant difference in fatigue effects across conditions. However, median scores on the *Iowa Fatigue Scale*, also included in the present study, were similar to fatigue scores in the 75th percentile of Hartz et al. (2003). That is, median scores for a non-clinical population were higher than the median scores in a clinical population where fatigue was a symptom. This outcome suggested that in the present study while fatigue was not modulated based on manipulations, participants did, in fact, become fatigued

after completing the Stroop Color-Word task. This outcome enabled the main experimental study analysis to be completed.

Hypothesis I: If indecisives underwent greater depletion of self-control resources in the prevention focus, a 3-way interaction was expected between decisional procrastination level, regulatory focus instruction, and threat level indicating that indecisives and decisives responded differently to regulatory focus and threat level, such that 3-way interactions would appear for amount of time searching information, amount of information searched, amount of information searched on the non-chosen option, amount of information search on the chosen option, the proportion of inter-dimensional shifts, and the proportion of intra-dimensional shifts.

Hypothesis I reflected that there would be a difference in how indecisives and decisives react to threatening situations when different regulatory foci were emphasized. Specifically, it was expected that the regulatory focus (promotion or prevention) primed by each Stroop Instruction condition would strengthen or attenuate a participant's chronically-available regulatory focus, affecting decision-making behaviors by indecisives and decisives in a subsequent exposure to varying levels of threat.

Results from the present study partially supported this hypothesis. More specifically, a significant three-way interaction between Stroop Instruction, Threat Level, and Level of Decisional Procrastination was found. This outcome meant that there was a significant difference between at least one of the two-way interactions based on the presence of a third factor. An examination of the univariate analyses showed significant interactions for the proportion of inter-dimensional shifts and the proportion of intra-dimensional shifts, but not any other dependent measures. Three-way interactions were

not statistically significant for other dependent variables, namely: the amount of time spent searching information (in any form of measurement), the total amount of information searched, the amount of information search on the non-chosen options, and the amount of information searched on the chosen option. In other words, it appears information search patterns may have differed but not the overall amount of information searched or time spent making a decision.

The pattern of results explored under Hypothesis I was similar to results by Luce et al. (1997), who investigated the role of negative emotion in decision-making. In their study, participants responded with both promotion-focused and emotion-focused coping, represented by greater information search and search patterns that focused on the attributes rather than the alternatives. In contrast, research on indecisives' decision making habits (e.g., Ferrari & Dovidio, 2000; 2001) found that indecisives tended to search less information while searching information by attributes more often than by alternative. The outcome in the present study most likely resulted from the lack of differences in the amount of fatigue experienced by participants after the Stroop Color-Word Task. Because participants reported no significant differences in the amount of fatigue, it seems likely that they had similar amount of self-regulatory resources available. Consequently, they would have engaged in similar amounts of information search (as was found).

Hypothesis I reflected the fact that all three factors may be required to see any differences in behavior. Hypothesis II, however, examined the expected psychological phenomenon underlying the differences - ego-depletion.

Hypothesis IIa: If depletion of self-control resources was stronger than the threat presented, an ordinal two-way interaction was expected for indecisives such that those in the prevention focus-higher threat condition would display more avoidant information search behaviors than indecisives in the other conditions, specifically, indecisives were expected to make more searches within attributes rather across attributes. Indecisives were also expected to search a higher proportion of information on the chosen alternative and a lower proportion of the non-chosen alternatives when compared to decisives.

Hypothesis IIb: If the depletion of self-control resources and regulatory fit strength to the threat were equivalent, a two-way interaction between regulatory focus instruction and threat level would not be expected for indecisives regarding avoidance information search behaviors. That is, indecisives in all four conditions would respond similarly.

Hypotheses IIa and IIb reflected the conceptual mechanism (i.e., a prevention focus in indecisives) causing ego-depletion differences between indecisives and decisives proposed in Hypothesis I. There were two potential outcomes hypothesized: namely, the potential for ego-depletion to either be stronger than or similar in strength to regulatory fit.

The expected outcome postulated for Hypothesis IIa appeared not to occur. When only indecisives were examined, the interaction between Stroop Instruction and Threat Level was not statistically significant. In other words, it appears that the effect of ego-depletion was not stronger than the effects of Regulatory Fit. For ego-depletion to be the underlying process, a statistically significant ordinal two-way interaction (between Stroop

Instruction and Threat Level) would have occurred. As a consequence, indecisives in the Prevention Focus/Higher Threat Condition would have engaged in more avoidant information search patterns than indecisives in the other three conditions. It was also expected that indecisives in that Prevention Focus/Higher Threat condition would have searched significantly less information about the non-chosen options and significantly more on the chosen options than the other three conditions, which did not occur.

Hypothesis IIb reflected the possibility that if the effect of ego-depletion and the effect of Regulatory Fit were similar in strength then they should “cancel each other out” in the Prevention Focus Instruction/Higher Threat Condition. Ego-depletion was expected to be stronger in the Prevention Focus Instruction, because the Promotion Focus Instruction was expected to attenuate indecisives’ chronic prevention focus. In the lower threat condition, avoidant behaviors (i.e., lower information search and search by attributes) were not expected because there was no threat to trigger them (or less of a threat). Therefore, while indecisives who received a Prevention Focus Instruction may have been more ego-depleted, they seemed less apt to engage in avoidant information search behaviors because there was no situational reason for avoidant reactions.

Thus, analyses of the information search data revealed no statistical significant two-way interactions for inter-dimensional shifts and intra-dimensional shifts, indicating that Hypothesis IIb was supported (or ego-depletion is not a real phenomenon, however the literature indicates the ego-depletion is real). Since there were no significant differences across Stroop conditions for fatigue, it seems likely that ego-depletion was similar across those conditions as well. This result means that only threat level and Regulatory Fit were different for indecisives. As before, the lower threat condition was

expected to have a low impetus for avoidant information search, and the promotion focus instruction was expected to attenuate a chronic prevention focus (and thus reduce regulatory fit to the higher threat condition). Without greater ego-depletion for indecisives who received a prevention focus instruction, those participants were likely to have sufficient resources for self-regulation to use fewer avoidant search tactics.

It is possible that the Stroop Color-Word Task manipulation did not function as expected. The prevention focus instruction was expected to increase the accuracy rates for participants who received it and for indecisives in particular as the instruction was expected to strengthen a hypothesized chronic prevention focus. In fact, accuracy rates were similar between the Prevention and Promotion Focus Instruction conditions and indecisives given the Prevention Focus Instruction actually had a lower accuracy rate than indecisives with a Promotion Focus Instruction (as part of a multivariate difference). This may account for why there was no difference in reported amounts of fatigue.

It may be relevant to think about these results in terms of the reported results by Ferrari and Dovidio (2007). In that study, the researchers found that indecisives were aware of their diminishing resources (at least implicitly) because as they progressed through a (different) Stroop task, their estimates of the cups of an unpleasant liquid they would drink decreased. In the present study, all participants were told that they would be engaging in two decision-making tasks. Consequently, indecisives may have let their attention relax somewhat and inaccuracies resulted.

Interestingly, the multivariate difference also may have been significantly influenced by the mean time per trial. Indecisives given the Prevention Focus Instruction tended to spend slightly more evaluating each trial (on the average) than those who

received a Promotion Focus Instruction. The converse occurred for decisives. That suggested that time spent evaluating information may not be the cause of ego-depletion (or to be more accurate, the only cause).

Hypothesis III: Decisives were expected to show a disordinal two-way interaction between Stroop task instruction and threat level such that in the low threat condition decisives who received promotion instruction were expected search more information inter-dimensionally and search less intra-dimensionally than those who received prevention focus instruction in the Stroop Color-Word task. The converse was expected for decisives in the high threat condition.

Hypothesis III reflected that decisives were expected to possess less of a chronic prevention focus (and potentially more of a chronic promotion focus) and experienced less ego-depletion in the Stroop Color-Word Task. In addition, the prevention focus instruction was expected to attenuate any chronic promotion foci possessed by decisives.

In the present study, it appeared that Hypothesis III was supported partially. Decisives given a promotion focus instruction made significantly more inter-dimensional shifts in the lower threat condition than in higher threat condition while at the same time making significantly more intra-dimensional shifts in the higher threat condition than in the lower. Though the difference only approached significance, decisives given a prevention focus instruction made more inter-dimensional shifts in the higher threat condition than the lower and more intra-dimension shifts in the lower threat condition than the higher. These behaviors appeared to be consistent with those expected for Regulatory Fit. That is, a prevention focus was expected to fit more strongly with a higher threat level. Moreover if the prevention focus instruction attenuated a chronic

promotion focus, it seems plausible that Regulatory Fit would be weaker for the prevention focus instruction compared to the promotion focus instruction (and thus, accounting for difference in statistical significances).

Alternate Hypothesis. If a chronic prevention focus plays no role in decisional procrastination, a disordinal two-way interaction for all participants (regardless of decisional procrastination level) between regulatory focus instruction and threat level was expected such that in the low threat condition participants who received promotion instruction were expected search more information inter-dimensionally, search less intra-dimensionally, and search more information on the non-chosen alternatives than those who received a prevention focus instruction. The converse was expected for participants in the high threat condition.

The Alternate Hypothesis in the present study reflected the potential for there to be no differences between indecisives and decisives in their chronically-available regulatory foci. Without that difference, only a two-way interaction between Stroop Instruction and Threat Level would have been possible.

The present study did not support the Alternate Hypothesis. Results showed a three-way interaction between Stroop Instruction, Threat Level, and Level of Decisional Procrastination, but the two-way interaction between Stroop Instruction and Threat level was not significant. The present study hypothesized that indecisives and decisives possessed different chronically-available regulatory foci. If indecisives and decisives had not differed, it was expected that any chronically-available regulatory foci would have been randomly distributed among both groups. In that case, the quasi-manipulation of decisional procrastination level would not have interacted significantly with the two

manipulations (Stroop Instruction and Threat Level) and only the two-way interaction of the manipulations would have been significant (as opposed to the three-way interaction).

Follow-Up Analyses

The follow-up analyses reexamined the hypotheses in light of removing the middle third of *DP* scores, so that only the extreme-ends remained. With the Stroop Color-Word task, indecisives who received a prevention focus instruction had a significantly lower accuracy rate than those who received a promotion instruction (and the converse happened with decisives). This time it appeared that fatigue may have been slightly (i.e., approaching significance) higher for indecisives who'd received a promotion focus than those who had received a prevention focus. It seemed that indecisives were undergoing greater ego-depletion when they responded accurately to the Stroop Color-Word Task (i.e., indicating the color of the word rather than the word itself).

Though the sample size was diminished, follow-up analyses reconfirmed that extreme-end indecisives and extreme-end decisives behaved differently under the influence of regulatory focus instruction and threat level (i.e., there was a statistically significant three-way interaction between Stroop Instruction, Threat Level, & Decisional Procrastination Level). Extreme scored decisives again behaved as expected if ego-depletion hadn't affected them as strongly as extreme-end indecisives. That is, extreme-scored decisives conformed to what would be expected through Regulatory Fit. Though analyses revealed no statistically significant differences among extreme-end indecisives, the interaction between Stroop Instruction and Threat Level approached significance for

inter-dimensional shifts. This suggested that a prevention focus may be the mechanism behind ego-depletion in indecisives, but the evidence remained inconclusive.

Limitations of the Present Study

Taken together, it appeared that the manipulations worked as intended. The Stroop task itself reduced the resources available for self-regulation as expected. Participants overall reported fatigue that was higher than that reported by the clinical sample from the scale development (Hartz et al., 2003). In addition, the threat manipulation appeared to function as expected since the higher threat condition received significantly higher threat and importance scores than the lower threat condition.

However, there are caveats to the present study. While the threat levels were meant to reflect lower or higher amounts of threat with respect to a job opportunity, it is possible that participants did not interpret the threat in that manner. In the lower threat condition, participants were told that the job was secure and that doing poorly in one class would not hurt their chances of keeping it. In this respect, participants may have seen the non-gain of a new class as threat rather than focus on the job opportunity. This explanation may mean that the two threat conditions (lower vs. higher) were qualitatively different (different types of threat) rather than quantitatively (different amounts of threat). Consequently, comparisons across the two threat conditions may be somewhat suspect.

The instructions given in the Stroop Color-Word Task were expected to cause a difference in the amount of fatigue participants subsequently reported as well as affecting indecisives and decisives differentially, but analysis showed that this was not the case. It seems plausible that the length of the Stroop Color-Word task may have overwhelmed any effects due to the instructions given. Consequently, ego-depletion would be similar

for all groups. However, this limitation may not be problematic as the Stroop Instruction factor showed a differential influence upon decisives (and possibly indecisives) depending on the level of threat.

The behavior of indecisives in the Stroop Color-Word task may not be a limitation per se, but rather needs to be accounted for in follow-up studies. It was expected that indecisives given a prevention focus instruction would have been more apt to be accurate (and spend more time to verify accuracy). In fact, indecisives given a prevention focus instruction had a lower accuracy rate than those given a promotion focus instruction despite spending slightly more time per trial on the average. There may even be an alternate explanation which is more subtle than ego-depletion. A prevention focus revolves around the motivation to avoid losses while a promotion focus revolves around the motivation to obtain gains. Rather than ego-depletion as a cause of indecisives' behaviors, it is possible that the motivations generated by a regulatory focus could subtly influence behavior in choice processing. That is, avoidant information search could be a consequence of an active prevention focus though that seems less likely.

Implications for the Current Study

While the present study found only partial support for the hypotheses, there still may be some implications for the "real world" to be considered. The results suggested that regulatory focus may play some role in chronic decisional procrastination. In other words, a person's long-term motivational focus (i.e., obtain gains; avoid losses in the case of regulatory focus theory) may affect how they make decisions. While the implications for indecisives remain murky, it seems clear that when decisives' motivations and

experience of threat are at odds they may tend to make decisions in a manner that may not give them the best results (though it may still be satisfactory). For example by focusing on one attribute upon which to eliminate alternatives, decisives potentially might ignore interactions among attributes that might contain better benefits and/or fewer undesired consequences. By shifting their goals to match the situations, decisives (but potentially not indecisives) may make better choices for themselves.

Future Research Directions, on Decisional Procrastination and Decision-making Strategies

The present study also suggested several topics of exploration for future research. It remains unclear if a prevention focus causes chronic decisional procrastination (because of ego-depletion). Future studies may include a protocol in which indecisives are forced to expend cognitive resources or obfuscate that an additional task is to be performed as well as exploring what happens when indecisives know there are upcoming tasks that require their attention. In addition, a prevention focus may increase affinity for avoidant tactics. Future research should explore the potential for regulatory focus itself to increase affinity for how information searches are approached in indecisives and decisives without ego-depletion present. The present study also found a (negative) correlation between social desirability and decisional procrastination not present in prior research on the topic that needs to be explored. Finally, the present study only tested one aspect of Regulatory Focus Theory with respect to chronic decisional procrastination. How indecisives and decisives frame a task may also affect decision-making behavior, especially in light of the potential for ego-depletion with a prevention focus. Future

research may wish to examine how Regulatory Fit, ego-depletion, and decision framing affect information search in decisives and indecisives.

Conclusions

The present study hypothesized that a chronic prevention focus in indecisives may explain why Ferrari and Pychyl (2007) found that they became more ego-depleted than decisives. When regulatory focus and threat level were manipulated, indecisives and decisives behaved differently in a decision-making task indicating that regulatory foci may differentially influence responses to threat depending on the level of chronic decisional procrastination. However, it was hypothesized that it was a chronic prevention focus in indecisives causing greater ego-depletion that is the cause. Therefore, the present study cannot draw any definitive conclusions about the mechanism of the effect.

Indecisives appeared to have circumvented ego-depletion by reducing accuracy on the Stroop Color-Word Task when they had been given instructions that emphasized a frame related to a prevention focus. It seems that regulatory focus may be implicated in chronic decisional procrastination in some manner, but the precise mechanism (or mechanisms) remain unclear.

CHAPTER V: OVERVIEW

The present study examined decisional procrastination hypothesized that one potential cause of chronic decisional procrastination was a *prevention focus* (Higgins, 1997; 1998). Prior research (e.g., Ferrari & Dovidio, 2007) found that individuals identified as indecisives, compared to decisives, may become more ego-depleted (c.f., Muraven & Baumeister, 2000) during tasks requiring vigilance (e.g., Stroop tasks). One study (Trawalter & Richeson, 2006) even provided a direct link between ego-depletion and a prevention focus. Prior research (Ferrari & Dovidio, 2000; 2001) also found that indecisives may tend to search information in a way that some researchers (e.g., Luce, et al, 1997) consider to be avoidant, a strategy used when resources are unavailable for coping directly with the problem at hand.

There were two potential ways in which regulatory focus may play a role, but the present study only examined how ego-depletion resulting from a prevention focus may affect decision-making behavior under stress or threat (i.e., similar to Janis & Mann's 1977 theory of decision-making under conflict-one origin of research in decisional procrastination). In this case, ego-depletion (as a result of a prevention focus) and threat were hypothesized to be opposing forces in that greater ego-depletion would tend to increase the likelihood of indecisive behaviors while a threat would tend to increase the likelihood of engagement with the decision (a phenomenon called *Regulatory Fit*, Higgins, 2000b). If indecisives possessed a chronically-available prevention focus (compared to decisives), then it was expected that exposure to a situational prevention focus would result in greater ego-depletion compared to decisives. When exposed to a subsequent threat, it was expected that indecisives would engage in more avoidant search

tactics than decisives as well as searching less information overall. It was expected that decisives would not experience ego-depletion to the same degree as indecisives, and that Regulatory Fit to the threat would be the operative force working on them.

The present study tested if indecisives and decisives possessed different regulatory foci through the use of two tasks: a Stroop Color-Word task and a variant of the “choosing a college course” task (Ferrari & Dovidio, 2000; 2001). The Stroop task was meant to cause differing amounts of ego-depletion depending on the instructions received. One set, gain points for correct answers (related to a *Promotion Focus*) was expected to result in less ego-depletion while the other, “lose points for incorrect answers” (related to a *Prevention Focus*) was expected to result in greater ego-depletion. The “college course choice” task was the actual test. Subsequent to the Stroop task, participants also completed a measure of fatigue and then received a threat level manipulation (lower vs. higher). The participants completed the college course choice task using Payne’s (1975) information and then completed measures of chronic decisional procrastination and social desirability. Of the two self-report measures listed above, the chronic decisional procrastination scale (Mann, 1982) was used to split participants into indecisives (high scores) and decisives (low scores) using the median.

Manipulation checks were used to verify that the experiment proceeded as expected. Participants in the higher threat condition reported a greater perception of threat than those in the lower threat condition, and the Stroop Color-Word task appeared to have depleted participants overall as they reported high fatigue levels. However, it was expected that the instructions on the Stroop task would have resulted in differing levels of fatigue, which did not occur. In addition, it was expected that indecisives and decisives

would have performed differently on the Stroop Task depending on the instructions received, which occurred but not as expected. Indecisives with the Lose Points instruction had been expected to perform better than when they had received the Gain Points instruction, but in fact, they had performed worse. This suggested that indecisives may have been conserving self-regulatory resources as per Ferrari and Pychyl (2007). This had implications for the conclusions that could be drawn.

Overall, the present study partially supported the hypotheses. The results indicated the Regulatory Focus plays a role in some manner, and though the present study hypothesized a mechanism (ego-depletion), the results are unclear in that respect.

A *MANOVA* found a significant three-way interaction between Decisional Procrastination Level, Stroop instruction, and Threat Level, suggesting that all three factors contributed to the behavior of the participants. However, it was only the search patterns that showed an interaction. The amount and type of information searched by participants showed no interactive effects.

When indecisives were examined separately, the present study found no significant interaction between Stroop Instruction and Threat Level for search strategies (or any other measure), suggesting the ego-depletion and threat balanced. It is worth noting that participants were told they would complete two tasks. Ferrari and Dovidio (2007) found that indecisives were aware of diminishing resources. Consequently, indecisives given the lose points instructions (hypothesized to result in greater depletion) may have let their attention relax (thus explaining the lower percentage correct in the Stroop task). However, this is speculative and potentially an interesting direction for future research.

It had been expected that Regulatory Fit (i.e., when the situation and regulatory focus match) would drive decisives' behaviors in the "choosing a college course" task. In fact, this was what occurred. When decisives were examined separately, the present study found that decisives used a less avoidant information search strategy when the threat level matched the regulatory focus induced the Stroop task instructions (i.e., lower threat/gain points; higher threat/lose points).

Future directions for research include devising an ego-depletion procedure that indecisives cannot inadvertently circumvent in order to better test ego-depletion as the mechanism by which a prevention focus may cause chronic decisional procrastination. In addition, how indecisives and decisives frame a task may also affect decision-making behavior, especially in light of the potential for ego-depletion with a prevention focus. Future research may wish to examine how Regulatory Fit, ego-depletion, and decision framing affect information search in decisives and indecisives.

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APPENDIX A

Consent Form

CONSENT TO PARTICIPATE IN RESEARCH

Choosing College Courses Under Pressure

What is the purpose of this research?

We are asking you to be in a research study because we are trying to learn more about how students choose college courses. You will be asked to review information about college courses, one of which you must choose to “take” in order to “graduate on time.” We wish to examine how students make decisions with multiple options when under pressure. You are invited to participate in this study because you are student at DePaul University and will not be graduating at the end of this quarter. This study is being conducted by Corey Hammer at DePaul University under the supervision of Dr. Joseph Ferrari.

How much time will this take?

This study will take about 10 minutes of your time.

What will I be asked to do if I agree to participate in this study?

If you agree to be in this study, you will be asked to review some information about hypothetical courses and choose one to take. You will then answer some questions about the decision you made.

What are the risks involved in participating in this study?

Being in this study does not involve any risks other than what you would encounter in daily life. You will be placed under some mild stress, but no more than you would experience when choosing a real college course. Some questions may ask about some personal preferences regarding decision-making behaviors but all information will remain anonymous—no direct or indirect identifying information will be recorded.

What are the benefits of my participation in this study?

You will not personally benefit from being in this study. However, we hope that what we learn will help understand the decision-making processes of students better.

Can I decide not to participate? If so, are there other options?

Yes, you can choose not to participate. Even if you agree to be in the study now, you can change your mind later and leave the study. There will be no negative consequences if you decide not to participate or change your mind later.

How will my privacy be protected?

The records of this study will be kept private. In any report we might publish, we will not include any information that will identify you. Research records will be stored securely and only researchers will have access to the records.

Whom can I contact for more information?

If you have questions about this study, please contact Corey Hammer through the Psychology office at 773-325-8788 or directly at corey_a_hammer@yahoo.com. If you have questions about your rights as a research subject, you may contact Shay-Ann Heiser Singh, DePaul University’s Director of Research Protections at 312-362-7593 or by email at sheiser@depaul.edu.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have all my questions answered. I consent to be in this study.

APPENDIX B

Mann's (1982) 5-item Decisional Procrastination Scale and demographics taken during administration of the scale.

People differ in how they go about making decisions. Please indicate how you make decisions by selecting the response to each question that best fits your usual style.

1 = NOT TRUE for me 4 = OFTEN TRUE for
me
2 = OFTEN UNTRUE for me 5 = TRUE for me
3 = SOMETIMES True/False for me

_____ 1. I waste a lot of time on trivial matters before getting to the final decisions.

_____ 2. Even after I make a decision I delay acting upon it.

_____ 3. I don't make decisions unless I really have to.

_____ 4. I delay making decisions until it's too late.

_____ 5. I put off making decisions.

APPENDIX C

Reynold's (1982) 13-item Short Form
of the Marlowe-Crown Social
Desirability Scale

Listed below are a number of statements concerning personal attitudes and traits.

Read each item and decide whether the statement is true or false as it pertains to you.

- | | | |
|---|---|---|
| T | F | 1. It is sometimes hard for me to go on with my work if I am not encouraged. |
| T | F | 2. I sometimes feel resentful when I don't get my way. |
| T | F | 3. On a few occasions, I have given up doing something because I thought too little of my ability. |
| T | F | 4. There have been times when I felt like rebelling against people in authority even though I knew they were right. |
| T | F | 5. No matter who I'm talking to, I'm always a good listener. |
| T | F | 6. There have been occasions when I took advantage of someone. |
| T | F | 7. I'm always willing to admit it when I make a mistake. |
| T | F | 8. I sometimes try to get even, rather than forgive or forget. |
| T | F | 9. I am always courteous, even to people who are disagreeable. |
| T | F | 10. I have never been irked when people expressed ideas very different than my own. |
| T | F | 11. There have been times when I was quite jealous of the good fortune of others. |
| T | F | 12. I am sometimes irritated by people who ask favors of me. |
| T | F | 13. I have never deliberately said something that hurt someone's feelings. |

APPENDIX D

Hartz, Bentler, & Watson's (2003)

Iowa Fatigue Scale

For each of the following items, choose a number that best indicates how you feel right now:

Not at all = 1

A little = 2

Moderately = 3

Quite a bit = 4

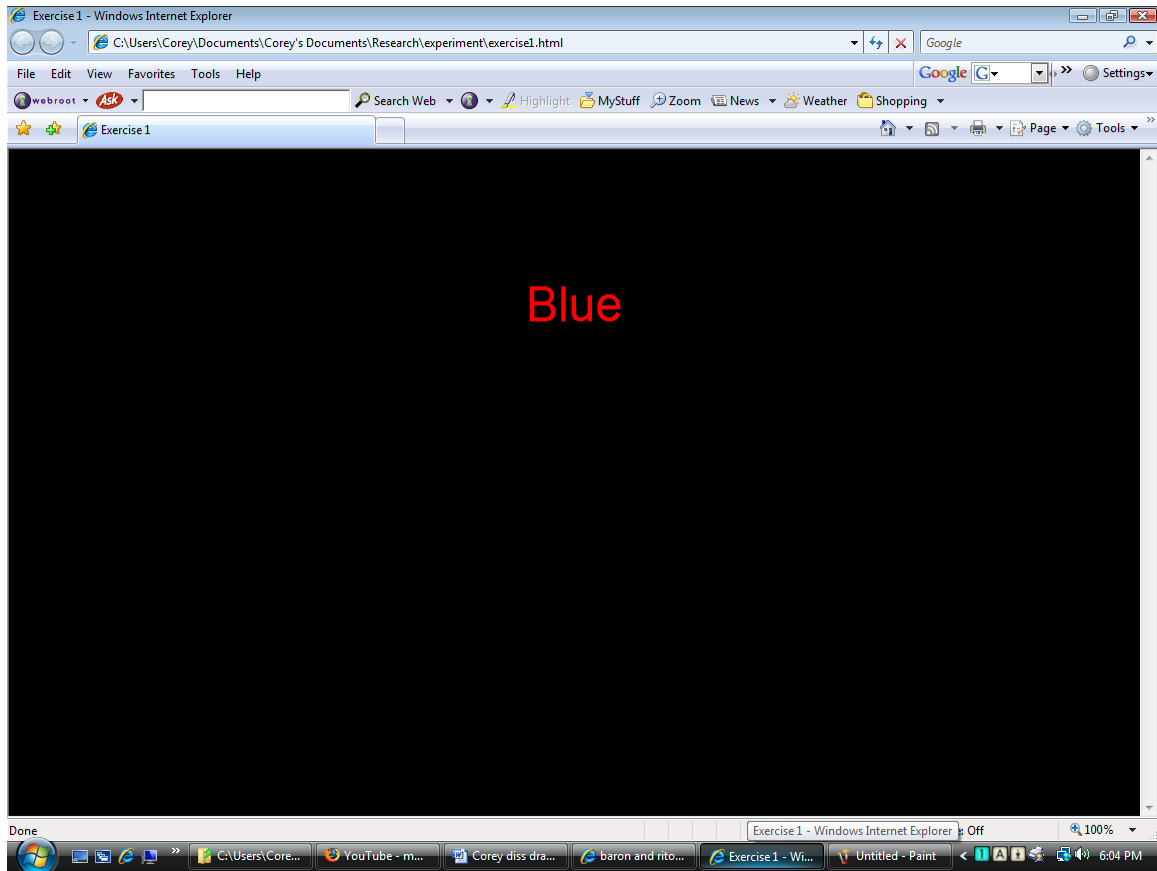
Extremely = 5

1. I feel worn out right now.
2. I feel energetic right now
3. I feel slowed down in my thinking right now.
4. I could do quite a lot with the rest of the day.
5. I have trouble concentrating right now.
6. I feel drowsy right now.
7. Physically, I feel in good shape right now.
8. I will have low output right now.
9. I have trouble with my memory right now.
10. I feel rested right now.
11. I can concentrate well right now.

APPENDIX E

The Stroop Color-Word Task Screenshot

Chronic Indecision and Regulatory Focus 103



APPENDIX F

Screenshot of a Sample Information Board

| | Time of Day | Lecture Length | Book Costs | Class Size | Personal Interest | Class Credits | Expected Work | Friends' Opinion |
|-------------------|--------------------|-----------------------|-------------------|-------------------|--------------------------|----------------------|----------------------|-------------------------|
| Course "A" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "B" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "C" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "D" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "E" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "F" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "G" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |
| Course "H" | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here | Click Here |

Click below to choose a course:

-