

Time pressure, personality, and information availability in escalation of commitment: An application of the Funder Personality Triad

by

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Abstract

The current work focused on the exploration of specific individual differences and task aspects on escalation of commitment. Further, it sought to expand the literature in decision-making by utilizing a specific personality framework, Funder's personality triad (2001), as a means to explain and analyze the impact of two specific personality traits (need for cognition) and task aspects (time pressure, information availability) on a specific behavior (escalation of commitment). Participants were recruited utilizing an online survey tool. All participants received the same measures (i.e., need for cognition, covariate measures). Task details and components, such as time and information available to complete the task, were specifically manipulated with participants being assigned to one of possible four conditions. Finally, the target behavior, escalation of commitment, was measured by the dollar amount participants invested in their assigned task condition during the completion of the task. Results demonstrated a significant main effect for information availability on escalation of commitment. No significant main effect was observed for time pressure. Further individual's need for cognition was a significant predictor of escalation of commitment. The interaction hypothesis between personality and each of the task components was not supported. Lastly, supplemental analysis demonstrated that the effects of information and time were strengthened when controlling for each of these aspects (although time remained non-significant).

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Funder's Personality Triad

Historically, the field of personality psychology has focused on achieving an understanding of the entire being (Funder, 2001). Throughout the past decades of study, behavioral prediction has gained importance. When referencing behavioral prediction in personality psychology, Funder (2001) means the behavioral patterns and predictabilities that make individuals act similarly and those aspects that makes us psychologically unique from others. Many paradigms, theories, and typologies have evolved in the continued search to explain and “account for patterns of thought, emotion, and behavior” (Funder, 2001; pg 198). Some of the classic paradigms reflected the zeitgeist during which they developed. For example, the psychoanalytic paradigm focuses on Freudian theory and the mind from nascence through adulthood in the development of personality (Blum, 1953). Another example, the Cognitive Affective Personality System (Mischel, 2004; Shoda & Mischel, 1998), is inclusive of the cognitive revolution. In his review, Funder also discusses the biological and evolutionary approaches to studying personality. In short, personality and human behavior have intrigued and populated psychological interest consistently for decades.

When considering the study of human behavior and personality psychology, Funder indicates that a complete picture of human behavior requires a study within a context. Funder (2001) describes his method for the study of human behavior as a personality triad. Specifically, Funder postulates that in order to fully understand human behavior one must study the combination of the person, the situation, and the behavior. These three aspects, although distinct, are interdependent and intrinsically connected. In order to understand any of these three aspects

one must consider the other two. As each of these acts interdependently, measuring the impact of any of these aspects requires measurement and accounting for the other two remaining variables. For instance, accurately measuring an individual's personality and controlling the situation allows us to predict behavior. Similarly, eliciting behavior and controlling the situation permits inferences regarding the person in distinct personality-behavior profiles (Mischel, 2004; Vansteelandt & Van Mechelen, 2004). Like pieces of a complicated puzzle, each aspect of the triad when measured together contributes to a complete image of behavior.

The personality triad provides a clear theoretical backdrop and basis for the empirical study of human behavior. The current study aims to utilize the postulated aspects of the personality triad as a means to understand a specific behavior: decision-making. More specifically, a decision-making phenomenon, known as escalation of commitment, is explored and observed in the context of the triad. The current therefore utilizes the Funder triad as the theoretical rationale for testing its hypotheses. Further, as is explored in later sections, research in escalation of commitment has focused on some but not all aspects outlined in the triad. The main contribution of the current study lies within its complete test of the interaction between the individual, the situation, and its impact on the behavior of interest. Human judgment and decision-making has three specific components (Appelt, Milch, Handgraaf, & Weber, 2011; Mohammed & Schwall, 2009): characteristics of the decision-maker, characteristics of the decision-making task, and characteristics of the decision environment. Each of the components characterized by these authors is present in the personality triad. Funder (2001) and Appelt, et al. (2011) both indicate that each of these three aspects must be taken into account in order to fully understand a behavioral phenomenon. Providing a complete perspective to the study of escalation of commitment is the aim and contribution of the current study to extant literature.

It is therefore logical to extend this line of thinking into more specific types of decision-making. Following research recommendations for decision making (e.g., Appelt, Milch, Handgraaf, & Weber, 2011), a theoretically relevant measure of the person and specific manipulations of the decision context will be applied to test for their effect on the occurrence and extent of escalation of commitment. This is described in the next section.

The Personality Triad in Decision-Making

The behavior: Escalation of Commitment

Definition and determinants.

Originating from observed phenomena such as framing (Kahneman & Tversky, 1984), utility theory (Tversky & Kahneman, 1981), and the sunk cost effect (Arkes & Blumer, 1985; Garland, 1990), escalation of commitment refers to the tendency to continue investment of resources despite persistent, negative feedback (Ross & Staw, 1993; Sleesman, Conlon, McNamara, & Miles, 2012; Staw, 1997). Since its original identification in early 1990s, escalation of commitment still continues to be one of most well researched decision-making phenomena in the social sciences (Sleesman et al., 2012).

The general definition of escalation of commitment, and the one utilized in the current study, requires that it contain three important aspects (Staw, 1997): the ability to withdraw from the decision task or project, ambiguous and unknown outcomes for the decision to persist or withdraw, and lastly a previous loss must be present. Various causes for escalation of commitment have been analyzed. Recent meta analysis results reflect that the psychological determinants and project determinants are well researched and significant predictors of escalation of commitment (Sleesman et al., 2012). A non-exhaustive list of these includes both determinants that had a positive or a negative relationship with escalation of commitment. This

includes sunk costs, where an individual is motivated to continue investing as a means of self-justification to regain their lost investment whether of time or money (e.g., Arkes & Blumer, 1985; Conlon & Garland, 1993; Garland & Conlon, 1998; Heath, 1995; Karlsson, Gärling, & Bonini, 2005). Personal responsibility for prior decisions demonstrated directly in the decision problem or in specific manipulation of this determinant (e.g., Conlon & Parks, 1987; Simonson & Staw, 1992; Staw, 1997). Negatively related to escalation is decision regret, which impacts how individuals rationalize the decision making process (Ku, 2008; Moon, 2001; Wong & Kwong, 2007).

The personality triad components and escalation.

In the context of the Funder personality triad, some individual differences in escalation of commitment have been analyzed. Specifically, it has been demonstrated that the duty component of conscientiousness led to greater escalation of commitment. However, the achievement striving component of conscientiousness led to less escalation of commitment. Similarly, in regards to neuroticism Moon, Hollenbeck, Humphrey, and Maue (2003) found that depression and anxiety have differential effects on escalation. While depression tended to lead to less escalation, the anxiety component of neuroticism was associated with increased escalation. An empirical test of a distinct personality trait from those in the Big Five, it was found that higher levels of rational thinking style increased belief in prior decisions, thus increasing the occurrence of escalation of commitment (Wong, Kwong, & Ng, 2008). Overall, there have been some findings to indicate that personality has an impact on escalation of commitment. However, the low congruity and number of studies in this arena indicate that personality is likely not the whole picture in predicting escalation.

Task components have also been observed to have an effect on escalation tasks. This includes the impact of project completion level in increasing the commitment to a course of action (Moon, 2001). Additionally, a series of studies designed to tease apart the sunk cost effects from those related to project completion found that the closer an individual was to project completion the more likely they were to continue their commitment (Conlon & Garland, 1993; Garland & Conlon, 1998). A very visible and egregious example of project completion effects on escalation is the Shoreham Nuclear Power Plant (Ross & Staw, 1993). In this popular example of extreme escalation of commitment, the state of New York spent \$5 billion over 23 years on a project that was budgeted to cost \$75 million. Further, a study of de-escalation of commitment utilized the most robust escalation determinants in order to manipulate task aspects (Simonson & Staw, 1992). These authors found that goal setting and asking individuals to compare their performance to their set goal, reduced escalation. Also, reducing threat from self-justification, by providing information to participants that their performance did not relate to their abilities to make business decisions in the real world, reduced the occurrence of escalation. Further, information whether it be asymmetry (Berg, Dickhaut, & Kanodia, 2009) or in form of uncertain versus certain feedback (Bragger, Bragger, Hantula, & Kirnan, 1998) has an impact on escalation of commitment, with symmetric information and unequivocal feedback leading to less escalation. The effects of task components have been indicated in the literature as important for both its impact on escalation and de-escalation of commitment to a prior decision. Therefore, consideration of task components is an integral part of investigating escalation of commitment.

The Situation

Situational Factors.

Situational factors as part of the personality triad has contributed to some agreement in the decision making literature (Appelt et al., 2011; Weber & Johnson, 2009). Examples of situational factors researched in the context of decision making include social context aspects such as group decision making (e.g., van Knippenberg, van Knippenberg, & van Dijk, 2000), cognitive load (e.g., Drolet & Luce, 2004), and the use of time pressure (e.g., Ebert, 2001). The focus of the current study is on risky decision making at the individual level. Therefore, the most contextually appropriate situational factors are those that occur at the individual level and are related to cognitive load: time pressure and information availability.

Time pressure and risky decisions.

The presence of time pressure in the decision making process induces individuals to use three distinct cognitive coping strategies. These include acceleration, in which the individual speeds up their decision making to compensate for lack of time. Decision avoidance described as when the individual avoids making a decision, or makes a random decision when forced to make a choice. Filtration, in which individuals utilize only the most salient information in their decision making process (Miller, 1960 as cited in Ben Zur & Breznitz, 1981). Utilizing these coping strategies, various applications of time pressure have been studied in risky decision making (Young, Goodie, Hall, & Wu, 2012). From this literature, three main themes have emerged from the time pressure literature.

Under the conditions of time pressure the usual utility curve of a decision as defined by Kahneman and Tversky (1984) has been found to be flatter when time pressure is added to a risky decision making environment (Dror, Basola, & Busemeyer, 1999; Svenson & Maule, 1993). The framing effect in the risky decision situation is thus less severe in time pressure situations, however it matters which direction the framing poses. For example, Young, Goodie,

Hall, and Wu (2012) observed that individuals under time pressure in a betting task were more attracted to the risky choice when the choice was framed as a gain. This is contrary to the framing effect as defined by Kahneman and Tversky (1984). However, in a loss frame participants in the same study were unable to discriminate the riskiness of the options provided under time pressure. Ben Zur and Breznitz (1981) found evidence that time pressure reduces individual risk propensity. In their study, individuals in a high time pressure condition made less risky choices and tended to inform their decisions by attending to more negatively framed information. These findings corroborate the framing effect. However, the link between time pressure and risky choice is dependent on the variance of probabilities associated with risky decision outcomes (Ben Zur & Breznitz, 1981; Busemeyer, 1985). Attending to more negative information can change the manner in which individuals view the utility of decision. Therefore, if a risky choice problem is negatively framed, less risky decisions will be made given the increased attention to the negative information provided. Additionally, when making decisions under time pressure, decision-makers tend to ignore or under utilize critical task information thus further enhancing the likelihood to rely on negative information (Dror et al., 1999).

Time pressure impacts a decision maker's arousal levels and reduces the cognitive resources available for complete deliberation and analytical thinking (Finucane, Alhakami, Slovic, & Johnson, 2000). This effect is partially due to monitoring time available while attending to critical information related to the task. A decrease in cognitive effort thus impacts the ability to fully process and deliberate during a decision (Kerstholt, 1994). The arousal induced by the stress of a time-pressure task further reduces cognitive effort in that individuals are more likely to access affective heuristics in processing the information. The affective heuristic leads the decision maker to associate a negative or positive aspect to the task and makes

affectively matched task information more salient during the decision making process (Finucane et al., 2000).

Another impact of time pressure is on decision quality. The presence of time pressure triggers decision makers to utilize more heuristic approaches when making decisions (Kocher & Sutter, 2006). Given that decisions made under time pressure tend to utilize less information and less time a tradeoff occurs between time and decision quality. Researchers describe this decline in decision quality as a closing of the mind (Kruglanski & Freund, 1983; as cited in Kocher & Sutter, 2006).

During the closing of the mind, individuals under time pressure rely on heuristics, do not process all information, and may rely on most salient cues even when information is unrelated to decision

Overall, time pressure affects the utility of decision outcomes, the cognitive processes utilized in attending to information in a decision, and the quality of a decision based on heuristic processing and cognitive load. Given the conclusions derived from research in the role of time pressure on the propensity to modify the cognitive processes in decision making, the following hypothesis is proposed.

Hypothesis 1: Individuals assigned to the time pressure condition in the escalation of commitment task will demonstrate greater escalation of commitment than those in the no time pressure condition.

Information availability.

As demonstrated in the results of the recent meta analysis, information has the ability to impact escalation of commitment (Sleesman et al., 2012). For example, the use and presentation of exact probabilities and outcomes as an attempt to mitigate escalation of commitment

(Karlsson et al., 2005). These authors found that in the presence of certainty and clearly unfavorable outcomes, individuals still escalated their commitment. When provided with the opportunity to purchase information, individuals invested fewer resources, exited the task faster, and invested less often than those who could not purchase additional information (Bragger et al., 1998; Bragger, Hantula, Bragger, Kirnan, & Kutcher, 2003). Additionally, when presented with opportunity cost information in a single choice to persist or desist with a project individuals exited the project more often (Northcraft & Neale, 1986). Therefore, individuals show a decreased tendency to escalate when presented with opportunity costs prior to making a decision.

Some interactions between information search and information availability with personality and other task aspects have also been observed in the decision making context. The search for information, termed “risk defusing operators”, expected to decrease risk and time pressure interact such that risky alternatives are chosen more often (Huber & Kunz, 2007). These authors found that in comparison to individuals with no time pressure the information search aided in decreasing risk. Additionally, in McDougal (1995) it was found that regardless of one’s level of preference for risk (measured as an individual difference), individuals pay more attention to safe information versus risky gambling information when both types of information are available. In another study comparing differences in receiving complete and incomplete information during a complicated task (aerial attack simulation) it was found that complete information improved performance but only when time pressure was not present (Ahituv, Igbaria, & Sella, 1998).

Overall, attempts to mitigate decision making errors, poor decision making, and to de-escalate commitment have received mixed results. Some studies analyzed the behavior of acquiring information, while others compared the availability of information on decision

behavior. Given that the focus of the current study is on the availability of information and its impact as a task aspect in decision making the following hypothesis will be tested.

Hypothesis 2: Individuals in the information available condition will demonstrate less escalation of commitment

The person

Individual differences in decision-making has been a well researched topic yielding somewhat mixed results (Appelt et al., 2011; Mohammed & Schwall, 2009; Weber & Johnson, 2009). The complicated issue of parsing out the impact of individual differences has resulted in an incomplete and even contradictory understanding of risky decision-making. Some of this work focused on general personality inventories and models (i.e., Big Five traits). It was suggested by Mohammed and Schwall (2009) that rather than utilizing broad personality inventories, researchers should seek theoretically relevant and appropriate personality variables and measures.

Need for Cognition

The need for cognition is a personality trait defined as an individual's general inclination for engaging in effortful and analytic thinking and processing (Cacioppo & Petty, 1982; Chatterjee, Heath, Milberg, & France, 2000). Individuals who are identified as having a high need for cognition are characterized as more "concentrated cognizers" versus their counterparts who are described as "cognitive misers" (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Further,+ individual differences in need for cognition also refers to a general difference in the overall enjoyment of engaging in thoughtful processes (Cacioppo et al., 1996).

The trait of need for cognition has been utilized in studies varying in fields and areas. Specifically, in a series of studies of consumer choice involving risk, it was found that negative

moods interacted with need for cognition in increasing risk taking with low need for cognition participants being more susceptible to mood (Lin, Yen, & Chuang, 2006). Further, need for cognition has been found to moderate the response to framing effects of advertising information, with low need for cognition individuals being more susceptible to framing (Zhang, Keil, Rai, & Mann, 2003). This trait has also been found to be related to information search in web behavior that leads to increased information seeking (Das, Echambadi, McCardle, & Luckett, 2003). Further support for this information search effect in web site usage was also found (Sicilia, Ruiz, & Munuera, 2005). These authors found that the effect of interactivity through information processing is smaller for those high in need for cognition. Individuals low in need for cognition dedicated their attention to more peripheral website aspects.

There are some experimental studies that utilize need for cognition in the examination of decision processes. In Ordóñez and Benson (1997) individuals were asked to switch between two tasks. One in which they rated the attractiveness of a gamble and the other in which they made choices regarding a buying price. Their findings indicate there is an interaction between utilizing a time constraint between tasks and need for cognition. More specifically, individuals low in need for cognition did not switch their cognitive processes as would have been required for a time-constrained task and differing choice types. And in general, those who scored lower in need for cognition tended to reverse to prior decisions and continue with their same binary cognitive decision process. Further, an interaction between time pressure and need for cognition also demonstrates that individuals low in need for cognition apply more heuristic information processes than their high need for cognition counterparts (Verplanken, 1993). In regards to loss versus gain frames, individual differences in need for cognition were not found in a loss framed mental accounting task. Individuals low in need for cognition performed equally well on the task

(Chatterjee et al., 2000). Thus suggesting that loss serves as a motivator for cognitive processing in those who are less inclined to do so.

In regards to its interaction with decision framing, there is evidence that Need for Cognition does not weaken the framing effect and the proclivity to respond in accordance to the frame received (LeBoeuf & Shafir, 2003). These authors also found that when participants received both decision frames for the same problem those who are higher in need for cognition responded consistently with their prior response. However, a study in the area of leadership, (Carnevale, Inbar, & Lerner 2011) found that individuals who are high in need for cognition were less susceptible to framing effects and experienced greater resistance to sunk costs. In Simon, Fagley, and Halleran (2004), individuals high in need for cognition were found to be less susceptible to framing effects. This effect was moderated by the math ability of individuals completing the problem. Thus demonstrating that the entire picture is more complicated than just accounting for a personality trait. Further evidence of the decreased susceptibility to framing for those with high need for cognition is found in a study in which framing was utilized to make choices regarding a ticket purchase and a medical treatment (Smith & Levin, 1996). An interaction between need for cognition and mood congruent framing was found, such that overconfidence in the decision to allocate funding was higher for those low in need for cognition as compared to those who are high in need for cognition (Kuvaas & Kaufmann, 2004).

Given the bulk of findings that individuals who are high in need for cognition are less susceptible to problem framing, prefer to engage in and enjoy more effortful processing, and that they have a demonstrated preference for prior choices the following hypothesis is proposed

Hypothesis 3: Individuals who score higher on need for cognition will be less likely to engage in escalation of commitment

Lastly, given that individuals low in need for cognition are more susceptible to mood manipulations (Lin et al., 2006), more susceptible to framing effects (Simon et al., 2004; Zhang et al., 2003), less likely to switch methods of processing even upon receiving negative feedback (Ordóñez & Benson, 1997), and apply more heuristic processing when making decisions (Verplanken, 1993) the following interactional hypothesis is proposed.

Hypothesis 4: Need for cognition will moderate the effect of time pressure and information availability, such that those with lower need for cognition will be more susceptible to these task manipulations and more likely to escalate their commitment.

Utilizing the Funder triad as a theoretical backdrop and theoretical rationale, the current study focuses on the study of aspects of the individual and the situation (through task aspects) as a means of understanding escalation of commitment. Although various studies, as reviewed in the current work, provide evidence that each of these components (the person and the situation) impact escalation of commitment separately, the current study aims at investigating the interaction of these components. Further, the direct effects of need for cognition, time pressure, and information availability also have the potential to add to our understanding of how specific aspects impact escalation of commitment.

Method

Participants

Participants were recruited through a posting on Amazon's Mechanical Turk website. Social science and survey research is increasingly completed through online platforms. The Amazon Mechanical Turk site provides a platform from which to quickly reach survey respondents while maintaining the integrity of the study (Mason & Suri, 2012). This website provides an easy-to-use direct way in which to recruit as well as compensate participants in research. A total of 465 participants completed the study and were included in the analyses to follow.

Recruited participants were at least 19 years of age and currently employed at least part-time. Participants were compensated \$1 for their participation in the study directly through the Mechanical Turk website. The average participant was 35 years of age ($SD=10.65$). Demographically, the majority of participants self-identified as White (291) and male (269). On average participants were employed 38 hours per week ($SD=10.54$). Additionally, 45% of participants completed a bachelor's degree. Further, the majority of participants, 44.7% reported being employed in a management or professional position. Lastly, the majority of participants reported their marital status as single (51.4%).

Procedure

Upon clicking on the study link participants were directed to the informed consent page. Participants were then instructed to carefully read the entire consent document. At the bottom of the informed consent page, participants were instructed to click on the "next" button in order to provide their consent for participation in the study. Once a participant clicked the next button,

Mechanical Turk directed them to the survey hosting site (Qualtrics) and the survey tasks and questionnaires launched accordingly.

The study was a 2 (time conditions: time pressure; no time pressure) x 2 (information availability conditions: information available; no information available) between-subjects design. The survey hosting site was programmed to randomly assign participants to one of four possible conditions. Once the survey system assigned a participant to one of the four conditions, the escalation of commitment task launched. More information regarding the escalation of commitment task is found in Appendix A and B. Upon completion of the task, participants were directed to complete further measures such as need for cognition, risk propensity measure, and car knowledge (Appendix C, D, and E, respectively). At the end of the survey materials participants were provided with the Mechanical Turk ID required for compensation and a link to psychological resources.

The task

The escalation of commitment task chosen is a car task. In this car task participants were asked to make continuous decisions regarding repairs to a car in which they have made an initial investment of \$12,000. Escalation of commitment is defined in the current study as the total number of dollars invested into the repairs to the vehicle as calculated from choosing to make a repair. A larger dollar amount invested into the vehicle indicated a greater extent of escalation. A total of 6 problems were used in the escalation of commitment “Car Task”. Participants were only able to complete a subsequent problem if they chose to continue to invest in the car. The highest total dollar amount participants could possibly invest in the vehicle was \$14,020 (complete escalation) and the minimum was no additional investment or \$0 (no escalation).

The car task was designed and pilot tested for use in a previous research study to ensure that escalation of commitment could occur. The previous study that utilized this task demonstrated that the task was successful. Specifically, the previous study found a significant main effect of escalation of commitment according to manipulation of conditions. The conditions included in the previous study consisted of repair values ordered from low to high prices and repair values ordered from high to low prices, thus the escalation conditions were manipulated. Given that ordering the repair dollar values has an effect on responses, the current study did manipulate the presentation of repairs to participants. All participants were shown each task in the same order, regardless of condition. Additionally, since the purpose of the current study is to test the impact of the person (need for cognition) and the situation (time pressure) on the behavior of escalation of commitment, it is most appropriate that the repairs in the task appeared the same for all participants. In this way, the task isolates solely the variables of interest and does not manipulate the presentation of each escalation problem.

Time pressure manipulation

Some of the contradictory findings related to time pressure and decision-making are attributed to arbitrary time pressure manipulations (Maule, Hockey, & Bdzola, 2000). For the current task, data from the previous study were analyzed to calculate the average and standard deviation of the completion time for the car task. The mean time for completion of the car task in the previous study was approximately 15 minutes ($SD=6.32$). In Ordóñez and Benson (1997) the time allotted for the time pressure condition was one standard deviation below the mean. Using their task design the completion time for the time pressure task was 1 minute per task problem. In order to incite pressure, a countdown clock was present in each task item for the time pressure conditions. Participants in the time pressure conditions could thus see the total amount of time

allotted to complete the task in the same screen as the task problem. The time pressure condition directions also included the total time allowed for decision making. In the conditions with no time pressure neither the clock nor the time allotted instructions were included.

Information Availability manipulation

The information availability manipulation was achieved through the inclusion and exclusion of key task data. In the no information condition, essential information to make an effective decision will not be present. Specifically, data pertaining to the car part that requires repair was removed as well as any information regarding the condition of the vehicle.

Participants in the no information available condition did not have the benefit of knowing what the definition of the part requiring repair is and its level of utility for the vehicle. This key piece of information was missing from their decision context. Conversely, the information available condition contained key information regarding the car part that requires repair. In order to fulfill the basic escalation condition requirement of monetary loss (Staw, 1997) and in accordance with findings related to the sunk cost effects (Arkes & Blumer, 1985), pricing information for each part repair and the original investment in the vehicle were present across conditions

Measures

Escalation of commitment

The dependent variable in the current work is the escalation of commitment demonstrated by each participant via the car task. The escalation of commitment for each participant was calculated as the total dollar amount invested in the repair of the car presented in the task. Each decision point was added to calculate the total amount invested. Participant investment in the car, and in turn their escalation of commitment, could range from \$0 (no escalation) to \$14,020 (complete escalation).

Need for Cognition

The short form need for cognition measure was utilized (Cacioppo et al., 1996). This measure consists of a total of 18 items. Each item reflects a statement that participants endorse on a 5-point scale. The scale ranges from 1 (extremely uncharacteristic) to 5 (extremely characteristic). There are nine items that are reverse scored. An example item includes: “I would prefer complex to simple problems”. And an example of a reverse scored item includes: “Thinking is not my idea of fun”. Higher scores indicate a greater preference for need for cognition. In an empirical scale validation study the internal consistency was found to be very high (Cronbach’s $\alpha = .90$; Cacioppo et al., 1996). In the current study, the reliability of the scale was also found to be high, Cronbach’s $\alpha = .95$.

Risk Propensity

The seven-item Risk Propensity Scale was utilized (Meertens & Lion, 2008) in order to measure the covariate of risk. This scale has nine anchors ranging from 1 (totally disagree) to 9 (totally agree). Higher scores on this scale demonstrate higher risk seeking tendencies. In a study conducted by Meertens and Lion (2008) the reliability coefficient of this scale was found to be high (Cronbach’s $\alpha = .80$). In the current study, the reliability of the risk propensity scale was $.83$.

Subjective Knowledge of Cars

A five-item scale will be utilized to assess the general subjective knowledge of cars. This scale is adapted from Flynn and Goldsmith (1999). Their five item subjective knowledge scale was created to assess general knowledge of products and to be utilized in consumer research environments. The scale is meant to be short and adaptable to a variety of domains and products to assess general subjective knowledge of specific products. In the authors’ five part scale

validation effort, their reliability coefficients were high ranging from .87 to .94. In the current study the reliability was high, Cronbach's $\alpha=.92$.

Results

The current study's purpose was to investigate the direct effect of two manipulated task variables (time pressure and information availability) on escalation of commitment. Further, the effects of the individual difference variable of need for cognition was also hypothesized and tested. Lastly, an interaction between each of the measured variables was tested as a means to understand any moderation effects of need for cognition and the Funder model as it relates to escalation of commitment. The following sections discuss the results of testing the efficacy of each manipulation, the effects of each independent variable on escalation of commitment, and the interaction effects of these variables.

Manipulation checks

Time Pressure

In order to check for the efficacy of the time pressure manipulation, manipulation check items were completed by each participant upon reaching their final escalation of commitment problem. The first item read as follows: "Please indicate how much time pressure you felt during the task you just completed". A four point scale was provided to each participant that ranged from "None" to "A great deal of time pressure".

To ascertain the effectiveness of the time pressure manipulation, an ANOVA was conducted to test for significant group differences in the reported feeling of time pressure experienced by participants. The overall ANOVA was significant ($F_{3, 461}=26.52$; $p<.01$; table 1). Post hoc tests for significant group differences revealed that the mean differences between the time pressure conditions and those conditions under which there was no time pressure were significant and in the expected direction. Specifically, the mean difference between the information available no time pressure condition and the information available time pressure

condition is significant (mean diff= $-.700$; SE=.113; $p<.01$), the mean difference is also in the expected direction. Further, the mean difference between the information available no time pressure condition and the no information available time pressure condition was also significant and in the expected direction (mean diff= $-.626$; SE=.115; $p<.01$). Additionally, the mean difference between the information available no time pressure condition and the no information available no time pressure condition is not significant (mean differ=.090; SE=.112; $p=.856$). Mean differences between the no information available no time pressure condition and the other two time pressure conditions were significant ($-.715$, .114; $P<.01$ and $-.790$, .112; $p<.01$, respectively). Lastly, the mean difference between the information available time pressure condition and the no information available time pressure condition was not significant (.075, .114, $p=.915$). Taken together, the results of the first time pressure manipulation check item indicate that the individuals in time pressure conditions on average felt significantly greater time pressure during the task than those in the no time pressure conditions.

In addition to the above time pressure manipulation check item, a second item was presented to participants. In this item participants were asked “Did you feel you had sufficient time to complete the task?” with answer choices of “yes” or “no”. A Chi-square difference test was conducted to test for differences in the frequency of “yes” or “no” responses between each condition. Although the overall Chi-square test is significant ($\chi=24.83$; $p<.01$), visual inspection of the differences in response frequencies do not demonstrate a major difference. Differences in response frequencies between each condition were in the correct overall direction. The frequency of responses for each condition can be found in table 2.

Overall, results derived from each of the time pressure manipulation check items demonstrate that the time pressure manipulation was successful. Participants in the time pressure

condition felt significantly more time pressure than those in the no time pressure conditions when completing the task.

Information Availability

A single item was used to test the information availability manipulation: “Did you feel you had sufficient information to make a decision?” Answer choices were in a “yes” or “no” format. A Chi-square significance test was conducted in order to test for significant differences in the frequency of responses between each condition. Overall, the Chi-square results were significant ($\chi^2=11.41$; $p=.010$). Additionally, visual inspection of the frequencies reflects that the overall pattern and direction of responses is in the expected direction (table 3). Overall, the results demonstrate the information availability manipulation was effective.

Hypothesis Testing

In order to test the main effect hypotheses proposed for both the effects of time pressure and information availability on escalation of commitment, a two-way analysis of variance was conducted. In this analysis conditions were collapsed across the other variable. In other words, the two time pressure conditions were collapsed into one time pressure condition and the two no time pressure conditions were collapsed into one no time pressure condition. The same coding process was completed for the information availability conditions. Additionally, covariates were added to ANOVA. Specifically, car knowledge, risk propensity and Need for Cognition. The following sections discuss the main effect results for time pressure and information availability, respectively.

Time Pressure

Hypothesis one predicted the following: individuals assigned to the time pressure condition in the escalation of commitment task will demonstrate greater escalation of

commitment than those in the no time pressure condition. In order to test this hypothesis, the main effect of the two-way ANOVA is considered. The main effect of time pressure on escalation of commitment was not significant ($F_{1,464}=.031$; $p=.859$; table 4). Hypothesis 1 was therefore not supported. Further, the mean dollar amount invested by those in the no time pressure condition was \$3,737.64 (SE=246.94). The mean dollar amount invested by individuals experiencing time pressure was \$3,675.20 (SE=250.80). The direction of these means is not as predicted with those in the no time pressure condition investing less in the vehicle during the task.

Information availability

Hypothesis two predicted the direct effect of the information availability manipulation on escalation of commitment. Specifically, this hypothesis predicted that individuals in the no information available conditions would demonstrate great escalation of commitment compared to those in the information available conditions. The main effect for information availability was significant ($F_{1,464}=7.238$, $p<.05$, $\eta^2=.016$; table 4). Therefore, hypothesis two was supported. Additionally, the mean dollar amount invested in the car was in the predicted direction. Individuals in the information available condition had a lower mean dollar amount invested (Mean= \$3,232.86, SE=247.87) compared to those in the information unavailable condition (Mean=\$4,179, SE= 249.69). The effect size for the information availability manipulation was measured using a partial eta squared and it was .016. Therefore, information availability explains 1.6% of the variance in total escalation of commitment. Although this statistic is rather small, the mean difference between the groups is just over \$900, making this a practically important finding.

Supplemental analysis

In addition to testing the predicted main effect hypotheses 1 and 2, supplemental analyses were ran in order to dig into the interaction effects and covariate effects of time and information on escalation. Specifically, a two-way ANOVA was conducted in which the effect of each manipulation (time pressure, information availability) was controlled for as covariates. Results, illustrated in table 5, indicate that participants' perceptions of these manipulations increased the effects of the information availability variable. The information availability effect was significant and stronger ($F_{1,463}=11.81, p <.01, \eta^2=.025$). The inclusion of the manipulations as covariates yielded a stronger partial eta square value for information availability conditions, explaining 2.5% of the variance in escalation of commitment. The main effect for time, however, remained non-significant when controlling for the manipulations of time and information ($F_{1,463}=.551, p =.458, \eta^2=.001$). Lastly, the results of the two-way ANOVA indicate that the interaction between time pressure and information availability was not significant ($F_{1,463}=.236, p =.627, \eta^2=.001$).

Need for cognition

The aim of the current work is to apply the Funder personality triad in the context of escalation of commitment. In addition to testing the effects of the manipulated task aspects of time pressure and information availability, the effect of need for cognition was predicted. Specifically, hypothesis 3 predicted that individuals high in need for cognition would be less likely to engage in escalation of commitment. Given that need for cognition refers to an individual difference in effortful thinking and information processing, it was predicted that this variable would affect the escalation of commitment of participants. Therefore, it was predicted that individuals high in need for cognition would have lower levels of escalation of commitment.

In order to test this hypothesis, participants' need for cognition scores were split into high and low levels. More specifically, a median split method was applied to separate participants into

two groups. The median split approach entails the calculation of the median scores and splitting scores into groups based on the calculate median. Upon splitting participants into two groups, a one way ANOVA was conducted for mean differences in escalation of commitment. The result approached significance ($F_{1,463}=3.80, p=.052$; table 6). The direction of the means was, however, in the opposite direction of what was predicted. For individuals high in need for cognition the average dollar amount invested in the task was \$4,036.75 and the average for those low in need for cognition was \$3,351.36. Overall, need for cognition had a significant effect on escalation of commitment dollar amount invested but this effect was in the opposite direction than what was predicted.

Interaction hypothesis

In order to test for the Funder personality triad, an interaction hypothesis was proposed. Hypothesis 4 predicted that need for cognition would moderate the effect of time pressure and information availability, such that those with lower need for cognition will be more susceptible to these task manipulations and more likely to escalate their commitment.

To test the moderation effects of need for cognition, the Baron and Kenny, (1986) approach was utilized. Specifically, the main effects of each of the situational factors were tested initially. As reported in a previous section, the main effect of time pressure was not significant. Therefore, further analysis as prescribed in the Baron and Kenny method was not conducted.

For information availability, the Baron and Kenny model was applied and the main effect was significant ($F_{1,464}=7.828, p<.05, \eta^2=.017$) Given this significant finding, the next step in testing for moderation was to test the main effect of the moderator on escalation of commitment (table 7). This main effect was not significant ($F_{1,464}=4.395, p=.037$). Lastly, the interaction between the moderator and the independent variable was measured. This interaction was not

significant ($F_{1,464}=.020, p=.888$). In light of these results, hypothesis 4 was not supported. Need for cognition did not moderate the effect of information availability or time pressure on escalation of commitment.

Discussion

The aim of the current study was to apply the Funder (2001) personality triad to a decision-making behavior, the escalation of commitment. Specifically, the current work focused on testing each of the three components postulated by Funder in his triad: the person, the environment, and the behavior. The relationship between each of these was hypothesized and tested to measure and identify their impact on escalation of commitment. As a means to apply the entirety of the Funder personality triad to predicting escalation of commitment, an interaction between each of the proposed variables was tested for moderating effects. Using a car task, escalation of commitment was tested among participants in four experimental groups. A discussion of the findings follows.

The Situation: Time Pressure and Information Availability

In order to test the effects of the situation, two situational factors were manipulated during the task. These situational factors were: time pressure and information availability. The hypothesized relationships for the situational variables was that having no time pressure and sufficient (versus insufficient) key task information through the duration of the task would lead to better decisions and lower escalation of commitment (hypotheses 1 and 2, respectively).

Time Pressure

The time pressure manipulation utilized in the task was efficacious in that participants indicated feeling greater time pressure in conditions under which time for task completion was manipulated. Although participants reported feeling more time pressure under conditions in which time pressure was directly manipulated, the overall time pressure hypothesis was not supported. Specifically, the difference in the mean dollar amounts invested by the time pressure and no time pressure conditions was only \$62.45. This difference was not statistically significant

and also not in the hypothesized direction, with individuals in the time pressure condition investing marginally less money, on average.

In the time pressure manipulation, it is interesting to note that there is a significant difference, as found by both manipulation check items, in the perceived time pressure felt by participants. However, it is possible that all individuals overall felt time pressure to make a decision. Therefore, the manipulation did not have a significant effect because while there was a difference in perception of the time pressure in the immediate situation, there was also time pressure due to the nature of the task itself. It is possible that the nature of the task and its focus on a car repair elicited an artificial time pressure for all participants. Repairs needed for a car are usually viewed as time sensitive, and perhaps this artificially created a sense of urgency in participants' decision-making.

The time pressure main effects findings corroborate the complicated and sometimes equivocal findings in this research. Specifically, if all individuals felt a general similar sense of time pressure it is possible that all individuals responded in a matter that is confirmatory of the impact of this perceived pressure. As the original work in time pressure and decision-making states (Miller, 1960 as cited in Ben Zur & Breznitz, 1981), time pressure elicits certain coping mechanisms. Namely, these mechanisms are acceleration, avoidance, and filtration. If participants felt a perception of time pressure due to the overall negative nature and car related task, there is reason to believe that these coping mechanisms were applied overall in the decision-making process.

Time pressure also has also had mixed findings in regards to its impact on the framing effect. Some authors have even noted that the utility curve normally seen in framing is flatter, and perhaps that points to why perceived time pressure did not differentially impact participant

escalation behavior (Dror et al., 1999; Svenson & Maule, 1993). The car task is also very similar to several loss framed items (Kahneman & Tversky, 1984; Tversky & Kahneman, 1981), and these types of frame have been studied under time pressure. Specifically, in a study in which positive and negative framing under time pressure was compared, the authors found that a loss frame led individuals to be less able to distinguish the riskiness in their choices (Young et al., 2012). Overall, it is likely that the non-significant findings derived from the application of time pressure are confirmatory of the mixed findings in the literature. Lastly, perhaps as all participants felt some aspect of time pressure, the specific impact of the manipulation is confounded in the perceived versus reported time pressure for participants.

Information Availability

The manipulation of information availability in the current study was found to be a significant predictor of escalation of commitment. As previously noted, individuals in the information availability condition were found to respond to the car task in a significantly different manner. Additionally, findings were in the predicted direction. Specifically, individuals who were provided less information had a higher mean dollar amount invested in the car presented in the task than those provided with more information.

The information availability findings confirm the hypothesized effect on escalation of commitment. Further, although the literature has provided mixed findings for information availability, it confirms a particular line of prior research. Specifically, that information during an escalation of commitment task impacts decision-making (Sleesman et al., 2012). Further, being provided with sufficient information, for example opportunity costs, leads to a decreased tendency to escalate commitment (Northcraft & Neale, 1986). Overall, having sufficient information about the car and the importance of the part needing repair likely provided

individuals with information necessary to make a decision. Those participants who had the ability to understand the importance of a repair were thus able to weigh it against the cost of repairs to make decisions. Overall, the current study found that having critical task information was beneficial in decision-making.

The Person: Need for Cognition

The findings for need for cognition indicate that this individual difference is a significant predictor of escalation of commitment, although one with a small effect size. The findings however, also are in the opposite direction of what was predicted. Given the strength of the framing effect and of the negative information provided in the car task, it is plausible that those low in need for cognition found the negative information more salient. Individuals high in need for cognition perhaps had a tendency to keep trying and to pursue the mental math loss in escalation and regain sunk costs (e.g., Arkes & Blumer, 1985; Heath, 1995; Karlsson et al., 2005). The need for cognition finding also corroborates those of Wong et al. (2008) in which rational thinking was found to be related to greater levels of escalation of commitment. Lastly, individuals low in need for cognition may have been exhausted by the task and quit sooner due to the fact that in general, these individuals tend to prefer to engage in less effortful tasks (Cacioppo & Petty, 1982; Cacioppo et al., 1996). Overall, the results indicate that greater rationality and need for effortful thinking, as is defined in need for cognition, was related to greater escalation of commitment.

Due to the direct effect of need for cognition, the interaction of this individual difference was tested for potential moderation. These results were not significant, and indicated that need for cognition did not moderate the relationship between time pressure and information availability and escalation of commitment. In order to understand these complicated relationships

more fully, an additional analysis was conducted in which the effect of each manipulation were tested as covariates.

In the supplemental analysis conducted, results demonstrated that the strength of the relationship between each of the independent variables was strengthened when controlling for the manipulation effect of the other manipulation. Although the significance levels of the relationships remain the same, the relationships are overall strengthened. The variance accounted for by each independent variable in escalation of commitment also increased. Given the influence of the situational factors observed in these findings, it is plausible that the situational strength created by these manipulations reduced the effect of personality while also confounding each other. Situational strength findings indicate that a strong situation will reduce the moderation effect of personality on behaviors (Beatty, Cleveland, & Murphy, 2001). An emphasis on task performance is elicited in strong task situations placing a focus on performance. Therefore the strength of the situation could have made psychological factors known for their relation to escalation of commitment more salient to the participant, for example decision regret or increased personal responsibility (Ku, 2008; Staw, 1997).

Future Research and Study Limitations

Future research on escalation of commitment should focus on controlling for the strength of the situation. Manipulations of situation strength, such as deferring responsibility or reducing the salience of negative information in escalation may allow for greater understanding of how personality affects escalation decisions. However, future work should ensure that if the escalation situation is weakened that it still fits the definition of escalation. In turn, future work should maintain the ambiguity, multiple decision points, and negative feedback associated with escalation.

Additionally, future research should be conducted to further understand the specific role of information and its availability on escalation of commitment. Although some work has been conducted in this realm such as probability information or project completion information (e.g., Conlon & Garland, 1993; Karlsson et al., 2005), more work can be done to fully understand the importance of information availability. The findings related to information availability demonstrate that critical task information is utilized and is important in escalation tasks. A better understanding of the types of information that potentially attenuate or increase escalation is recommended.

Lastly, given the general mixed results in the literature and the results of the current work, future research should focus on understanding how individual differences impact escalation of commitment. Future work should focus on understanding the specific role of these differences in a broader approach than has been utilized. Specifically, broadening the definition of individual differences beyond personality and affect to understand how the person impacts the decision making process.

Some limitations of the current study should also be addressed. First, all data was collected using self-report measures and survey methodology. Although the car task was designed with each of the components required for escalation of commitment scenarios (Staw, 1997) in mind, an experimental task cannot fully mimic real-world decisions. Further, all decisions were made in succession during one time point. It is possible that escalation decisions, specifically those relating to car repairs, could be different if participants were tested at multiple time points. Future research efforts should, as much as possible, mitigate the potential effects of these limitations.

Overall, the current work focused on applying the Funder triad to a specific pervasive decision making behavior. Although results were mostly mixed, it is important to understand that there are still many aspects of the escalation of commitment situation that should be explored.

References

- Ahituv, N., Igbaria, M., & Sella, A. (1998). The effects of time pressure and completeness of information on decision making. *Journal of Management Information Systems*, *15*(2), 153–172.
- Appelt, K. C., Milch, K. F., Handgraaf, M. J. J., & Weber, E. U. (2011). The decision making individual differences inventory and guidelines for the study of individual differences in judgment and decision-making research. *Judgment and Decision Making*, *6*(3), 252–262.
- Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes*, *35*(1), 124–140.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. <http://doi.org/10.1037/0022-3514.51.6.1173>
- Beatty Jr., C. B., Cleveland, J. N., & Murphy, K. R. (2001). The relation between personality and contextual performance in “Strong” versus “Weak” situations. *Human Performance*, *14*(2), 125–148. http://doi.org/10.1207/S15327043HUP1402_01
- Ben Zur, H., & Breznitz, S. J. (1981). The effect of time pressure on risky choice behavior. *Acta Psychologica*, *47*(2), 89–104. [http://doi.org/10.1016/0001-6918\(81\)90001-9](http://doi.org/10.1016/0001-6918(81)90001-9)
- Berg, J. E., Dickhaut, J. W., & Kanodia, C. (2009). The role of information asymmetry in escalation phenomena: Empirical evidence. *Journal of Economic Behavior & Organization*, *69*(2), 135–147. <http://doi.org/10.1016/j.jebo.2007.07.007>
- Blum, G. S. (1953). *Psychoanalytic theories of personality*. New York: McGraw-Hill.

- Bragger, J. D., Bragger, D., Hantula, D. A., & Kirnan, J. (1998). Hyteresis and uncertainty: The effect of uncertainty on delays to exit decisions. *Organizational Behavior and Human Decision Processes*, 74(3), 229–253. <http://doi.org/10.1006/obhd.1998.2779>
- Bragger, J. D., Hantula, D. A., Bragger, D., Kirnan, J., & Kutcher, E. (2003). When success breeds failure: History, hysteresis, and delayed exit decisions. *Journal of Applied Psychology*, 88(1), 6–14. <http://doi.org/10.1037/0021-9010.88.1.6>
- Busemeyer, J. R. (1985). Decision making under uncertainty: A comparison of simple scalability, fixed-sample, and sequential-sampling models. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11(3), 538–564. <http://doi.org/10.1037/0278-7393.11.3.538>
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42(1), 116–131. <http://doi.org/10.1037/0022-3514.42.1.116>
- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, 119(2), 197–253. <http://doi.org/10.1037/0033-2909.119.2.197>
- Carnevale, J. J., Inbar, Y., & Lerner, J. S. (2011). Individual differences in need for cognition and decision-making competence among leaders. *Personality and Individual Differences*, 51(3), 274–278. <http://doi.org/10.1016/j.paid.2010.07.002>
- Chatterjee, S., Heath, T. B., Milberg, S. J., & France, K. R. (2000). The differential processing of price in gains and losses: The effects of frame and need for cognition. *Journal of Behavioral Decision Making*, 13(1), 61–75. [http://doi.org/10.1002/\(SICI\)1099-0771\(200001/03\)13:1<61::AID-BDM343>3.0.CO;2-J](http://doi.org/10.1002/(SICI)1099-0771(200001/03)13:1<61::AID-BDM343>3.0.CO;2-J)

- Conlon, D. E., & Garland, H. (1993). The role of project completion information in resource allocation decisions. *Academy of Management Journal*, *36*(2), 402–413.
<http://doi.org/10.2307/256529>
- Conlon, E. J., & Parks, J. M. (1987). Information requests in the context of escalation. *Journal of Applied Psychology*, *72*(3), 344–350. <http://doi.org/10.1037/0021-9010.72.3.344>
- Das, S., Echambadi, R., McCardle, M., & Luckett, M. (2003). The effect of interpersonal trust, need for cognition, and social loneliness on shopping, information seeking and surfing on the web. *Marketing Letters*, *14*(3), 185–202.
- Drolet, A., & Luce, M. F. (2004). The rationalizing effects of cognitive load on emotion-based trade-off avoidance. *Journal of Consumer Research*, *31*(1), 63–77.
- Dror, I. E., Basola, B., & Busemeyer, J. R. (1999). Decision making under time pressure: An independent test of sequential sampling models. *Memory & Cognition*, *27*(4), 713–725.
<http://doi.org/10.3758/BF03211564>
- Ebert, J. E. J. (2001). The role of cognitive resources in the valuation of near and far future events. *Acta Psychologica*, *108*(2), 155–171. [http://doi.org/10.1016/S0001-6918\(01\)00033-6](http://doi.org/10.1016/S0001-6918(01)00033-6)
- Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making*, *13*(1), 1–17.
[http://doi.org/10.1002/\(SICI\)1099-0771\(200001/03\)13:1<1::AID-BDM333>3.0.CO;2-S](http://doi.org/10.1002/(SICI)1099-0771(200001/03)13:1<1::AID-BDM333>3.0.CO;2-S)
- Funder, D. C. (2001). Personality. *Annual Review of Psychology*, *52*(1), 197–221.
<http://doi.org/10.1146/annurev.psych.52.1.197>
- Garland, H. (1990). Throwing good money after bad: The effect of sunk costs on the decision to escalate commitment to an ongoing project. *Journal of Applied Psychology*, *75*(6), 728.

- Garland, H., & Conlon, D. E. (1998). Too close to quit: The role of project completion in maintaining commitment. *Journal of Applied Social Psychology, 28*(22), 2025–2048. <http://doi.org/10.1111/j.1559-1816.1998.tb01359.x>
- Heath, C. (1995). Escalation and de-escalation of commitment in response to sunk costs: The role of budgeting in mental accounting. *Organizational Behavior and Human Decision Processes, 62*(1), 38–54. <http://doi.org/10.1006/obhd.1995.1029>
- Huber, O., & Kunz, U. (2007). Time pressure in risky decision-making: Effect on risk defusing. *Psychology Science, 49*(4), 415.
- Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist, 39*(4), 341.
- Karlsson, N., Gärling, T., & Bonini, N. (2005). Escalation of commitment with transparent future outcomes. *Experimental Psychology, 52*(1), 67–73. <http://doi.org/10.1027/1618-3169.52.1.67>
- Kerstholt, J. (1994). The effect of time pressure on decision-making behaviour in a dynamic task environment. *Acta Psychologica, 86*(1), 89–104. [http://doi.org/10.1016/0001-6918\(94\)90013-2](http://doi.org/10.1016/0001-6918(94)90013-2)
- Kocher, M. G., & Sutter, M. (2006). Time is money—Time pressure, incentives, and the quality of decision-making. *Journal of Economic Behavior & Organization, 61*(3), 375–392.
- Ku, G. (2008). Learning to de-escalate: The effects of regret in escalation of commitment. *Organizational Behavior and Human Decision Processes, 105*(2), 221–232. <http://doi.org/10.1016/j.obhdp.2007.08.002>

- Kuvaas, B., & Kaufmann, G. (2004). Impact of mood, framing, and need for cognition on decision makers' recall and confidence. *Journal of Behavioral Decision Making*, *17*(1), 59–74. <http://doi.org/10.1002/bdm.461>
- LeBoeuf, R. A., & Shafir, E. (2003). Deep thoughts and shallow frames: on the susceptibility to framing effects. *Journal of Behavioral Decision Making*, *16*(2), 77–92. <http://doi.org/10.1002/bdm.433>
- Lin, C.-H., Yen, H. R., & Chuang, S.-C. (2006). The effects of emotion and need for cognition on consumer choice involving risk. *Marketing Letters*, *17*(1), 47–60. <http://doi.org/10.1007/s11002-006-4146-2>
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, *44*(1), 1–23. <http://doi.org/10.3758/s13428-011-0124-6>
- Maule, A. J., Hockey, G. R. J., & Bdzola, L. (2000). Effects of time-pressure on decision-making under uncertainty: Changes in affective state and information processing strategy. *Acta Psychologica*, *104*(3), 283–301. [http://doi.org/10.1016/S0001-6918\(00\)00033-0](http://doi.org/10.1016/S0001-6918(00)00033-0)
- McDougal, Y. B. (1995). Decision making under risk: Risk preference, monetary goals and information search. *Personality and Individual Differences*, *18*(6), 771–782. [http://doi.org/10.1016/0191-8869\(94\)00207-9](http://doi.org/10.1016/0191-8869(94)00207-9)
- Meertens, R. M., & Lion, R. (2008). Measuring an individual's tendency to take risks: The risk propensity scale1. *Journal of Applied Social Psychology*, *38*(6), 1506–1520. <http://doi.org/10.1111/j.1559-1816.2008.00357.x>
- Mischel, W. (2004). Toward an integrative science of the person. *Annual Review of Psychology*, *55*(1), 1–22. <http://doi.org/10.1146/annurev.psych.55.042902.130709>

- Mohammed, S., & Schwall, A. (2009). Individual differences and decision making: What we know and where we go from here. In *International Review of Industrial and Organizational Psychology* (Vol. 24). John Wiley & Sons.
- Moon, H. (2001). Looking forward and looking back: Integrating completion and sunk-cost effects within an escalation-of-commitment progress decision. *Journal of Applied Psychology, 86*(1), 104–113. <http://doi.org/10.1037/0021-9010.86.1.104>
- Moon, H., Hollenbeck, J. R., Humphrey, S. E., & Maue, B. (2003). The tripartite model of neuroticism and the suppression of depression and anxiety within an escalation of commitment dilemma. *Journal of Personality, 71*(3), 347–368.
- Northcraft, G. B., & Neale, M. A. (1986). Opportunity costs and the framing of resource allocation decisions. *Organizational Behavior and Human Decision Processes, 37*(3), 348–356. [http://doi.org/10.1016/0749-5978\(86\)90034-8](http://doi.org/10.1016/0749-5978(86)90034-8)
- Ordóñez, L., & Benson III, L. (1997). Decisions under time pressure: How time constraint affects risky decision making. *Organizational Behavior and Human Decision Processes, 71*(2), 121–140. <http://doi.org/10.1006/obhd.1997.2717>
- Ross, J., & Staw, B. M. (1993). Organizational escalation and exit: Lessons from the Shoreham Nuclear Power Plant. *Academy of Management Journal, 36*(4), 701–732. <http://doi.org/10.2307/256756>
- Shoda, Y., & Mischel, W. (1998). Personality as a stable cognitive-affective activation network: Characteristic patterns of behavior variation emerge from a stable personality structure. In *Connectionist Models of Social Reasoning and Social Behavior* (Mahwah, NJ, pp. 175–208). Erlbaum.

- Sicilia, M., Ruiz, S., & Munuera, J. L. (2005). Effects of interactivity in a web site: The moderating effect of Need for Cognition. *Journal of Advertising*, 34(3), 31–44.
<http://doi.org/10.1080/00913367.2005.10639202>
- Simon, A. F., Fagley, N. S., & Halleran, J. G. (2004). Decision framing: Moderating effects of individual differences and cognitive processing. *Journal of Behavioral Decision Making*, 17(2), 77–93. <http://doi.org/10.1002/bdm.463>
- Simonson, I., & Staw, B. M. (1992). Deescalation strategies: A comparison of techniques for reducing commitment to losing courses of action. *Journal of Applied Psychology*, 77(4), 419–426. <http://doi.org/10.1037/0021-9010.77.4.419>
- Sleesman, D. J., Conlon, D. E., McNamara, G., & Miles, J. E. (2012). Cleaning up the big muddy: A meta-analytic review of the determinants of escalation of commitment. *Academy of Management Journal*, 55(3), 541–562. <http://doi.org/10.5465/amj.2010.0696>
- Smith, S. M., & Levin, I. P. (1996). Need for cognition and choice framing effects. *Journal of Behavioral Decision Making*, 9(4), 283–290. [http://doi.org/10.1002/\(SICI\)1099-0771\(199612\)9:4<283::AID-BDM241>3.0.CO;2-7](http://doi.org/10.1002/(SICI)1099-0771(199612)9:4<283::AID-BDM241>3.0.CO;2-7)
- Staw, B. M. (1997). The escalation of commitment: An update and appraisal. In *Organizational decision making*. Cambridge; New York, NY: Cambridge University Press.
- Svenson, O., & Maule, A. J. (Eds.). (1993). *Time pressure and stress in human judgment and decision making*. New York: Plenum Press.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211(4481), 453–458. <http://doi.org/10.2307/1685855>

- Van Knippenberg, D., van Knippenberg, B., & van Dijk, E. (2000). Who takes the lead in risky decision making? Effects of group members' risk preferences and prototypicality. *Organizational Behavior and Human Decision Processes*, 83(2), 213–234.
<http://doi.org/10.1006/obhd.2000.2907>
- Vansteelandt, K., & Van Mechelen, I. (2004). The personality triad in balance: Multidimensional individual differences in situation–behavior profiles. *Journal of Research in Personality*, 38(4), 367–393. <http://doi.org/10.1016/j.jrp.2003.08.001>
- Verplanken, B. (1993). Need for cognition and external information search: Responses to time pressure during decision-making. *Journal of Research in Personality*, 27(3), 238–252.
<http://doi.org/10.1006/jrpe.1993.1017>
- Weber, E. U., & Johnson, E. J. (2009). Mindful judgment and decision making. *Annual Review of Psychology*, 60(1), 53–85. <http://doi.org/10.1146/annurev.psych.60.110707.163633>
- Wong, K. F. E., & Kwong, J. Y. Y. (2007). The role of anticipated regret in escalation of commitment. *Journal of Applied Psychology*, 92(2), 545–554.
<http://doi.org/10.1037/0021-9010.92.2.545>
- Wong, K. F. E., Kwong, J. Y. Y., & Ng, C. K. (2008). When thinking rationally increases biases: The role of rational thinking style in escalation of commitment. *Applied Psychology*, 57(2), 246–271. <http://doi.org/10.1111/j.1464-0597.2007.00309.x>
- Young, D. L., Goodie, A. S., Hall, D. B., & Wu, E. (2012). Decision making under time pressure, modeled in a prospect theory framework. *Organizational Behavior and Human Decision Processes*, 118(2), 179–188.

Zhang, G. P., Keil, M., Rai, A., & Mann, J. (2003). Predicting information technology project escalation: A neural network approach. *European Journal of Operational Research*, 146(1), 115–129. [http://doi.org/10.1016/S0377-2217\(02\)00294-1](http://doi.org/10.1016/S0377-2217(02)00294-1)

Table 1

One-Way ANOVA: Time Pressure Manipulation Check

Source	<i>df</i>	<i>F</i>	<i>p</i>
Between Groups	3	26.52**	.000
Within Groups	461		
Total	464		

Note ** Significant at the $p < .001$ level

Table 2

Frequency of Responses for Time Manipulation Check Item 2

<i>Condition</i>	<i>“Yes” Response</i>	<i>“No” Response</i>
Information Available/No Time Pressure	116	0
Information Available/Time Pressure	99	19
No Information Available/Time Pressure	101	10
No Information Available/ No Time Pressure	115	5
Total	431	34

Table 3

Frequency of Responses for Information Availability Manipulation Check

<i>Condition</i>	<i>“Yes” Response</i>	<i>“No” Response</i>
Information Available/No Time Pressure	95	21
Information Available/Time Pressure	91	26
No Information Available/Time Pressure	74	37
No Information Available/ No Time Pressure	79	41
Total	339	125

Table 4

Two-Way ANOVA: Main Effect Hypotheses (1 and 2)

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Risk Propensity	1	.504	.478	.001
Need for Cognition	1	.682	.409	.001
Subjective Car Knowledge	1	.359	.549	.001
Information Conditions	1	7.238*	.007	.016
Time Conditions	1	.031	.859	.000
Information*Time	1	.564	.453	.001
Error	458			
Total	465			
Corrected Total	464			

Note *Significant at the $p < .05$ level

Table 5

Two-Way ANOVA: Supplemental Analysis

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Time Manipulation Check (Item 1)	1	2.766	.097	.006
Information Manipulation Check	1	19.496**	.000	.041
Information Availability Condition	1	11.809*	.001	.025
Time Pressure	1	.551	.458	.001
Information Availability*Time Pressure	1	.236	.627	.001
Error	458			
Total	464			
Corrected Total	463			

Note **Significant at the $p < .05$ level; *Significant at the $p < .01$ level

Table 6

One-Way ANOVA: Need for Cognition (High, Low)

Source	<i>df</i>	<i>F</i>	<i>p</i>
Between Groups	1	3.80	.052
Within Groups	463		
Total	464		

Table 7

Two- Way ANOVA: Moderation Analysis

Source	<i>df</i>	<i>F</i>	<i>p</i>	η^2
Information Conditions	1	7.828	.005	.017
Need for Cognition (high, low)	1	4.395	.037	.009
Information Conditions * Need for Cognition (high, low)	1	.020	.888	.000
Error	461			
Total	465			
Corrected Total	464			

Appendix A

Escalation of Commitment Task: Car Task

Condition 1: Information available/Time pressure

You bought a used mid-size sedan car costing \$12,000. The car has been inspected and found to be in good condition by two mechanics you trust. There were 65,000 miles on the car at the time of purchase.

Please note that if you decide not to proceed with the repair, you have access to public transportation while you can attempt to sell the vehicle

The car has another problem and needs another repair.

The alternator needs to be replaced. The lowest estimated cost is \$500.

Definition: The alternator produces alternating current which is converted to direct current; it functions much like a generator within a car.

Remember: You have 1 minute to complete this decision

Please choose one of the following:

- A) You decide to replace the alternator.

- A) You decide not to replace the alternator.

Condition 2: Information not available/Time pressure

You bought a used mid-size sedan car costing \$12,000. The car has been inspected and found to be in good condition by two mechanics you trust. There were 65,000 miles on the car at the time of purchase.

The car needs another repair.

The alternator needs to be replaced. The lowest estimated cost is \$500.

Remember: You have 1 minute to complete this decision

Please choose one of the following:

- A) You decide to replace the alternator.
- B) You decide not to replace the alternator.

Condition 3: Information available/No time pressure

You bought a used mid-size sedan car costing \$12,000. The car has been inspected and found to be in good condition by two mechanics you trust. There were 65,000 miles on the car at the time of purchase.

Please note that if you decide not to proceed with the repair, you have access to public transportation while you can attempt to sell the vehicle

The car has another problem and needs another repair.

The alternator needs to be replaced. The lowest estimated cost is \$500.

Definition: The alternator produces alternating current which is converted to direct current; it functions much like a generator within a car.

Please choose one of the following:

- A) You decide to replace the alternator.
- B) You decide not to replace the alternator.

Condition 4: Information not available/No time pressure

You bought a used mid-size sedan car costing \$12,000. The car has been inspected and found to be in good condition by two mechanics you trust. There were 65,000 miles on the car at the time of purchase.

The car needs another repair.

The alternator needs to be replaced. The lowest estimated cost is \$500.

Please choose one of the following:

- A) You decide to replace the alternator.
- B) You decide not to replace the alternator.

Appendix B

Complete List of Car Task Problems:

<i>Problem Number</i>	<i>Car Part for Repair</i>
1	Alternator
2	Ignition Coils
3	Radiator
4	Brakes
5	Transmission
6	Engine

Appendix C

Short Form Need for Cognition Scale (Cacioppo et al., 1996)

Instructions

For each of the statements below please indicate to what extent the statement is characteristic of you. Please use the following scale:

1= extremely uncharacteristic; 2= somewhat uncharacteristic; 3= uncertain; 4= somewhat characteristic; 5= extremely characteristic

1. I would prefer complex to simple problems
2. I like to have responsibility of handling a situation that requires a lot of thinking
3. Thinking is not my idea of fun*
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities*
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something*
6. I find satisfaction in deliberating hard and long for hours
7. I only think as hard as I have to*
8. I prefer to think about small, daily projects to long-term ones*
9. I like tasks that require little thought once I've learned them*
10. The idea of relying on thought to make my way to the top appeals to me
11. I really enjoy a task that involves coming up with new solutions to problems
12. Learning new ways to think doesn't excite me very much*
13. I prefer my life to be filled with puzzles that I must solve
14. The notion of thinking abstractly is appealing to me
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort*
17. It's enough for me that something gets the job done; I don't care how or why it works*
18. I usually end up deliberating about issues even when they do not affect me personally

*Reverse Scored Item

Appendix D

Risk Propensity Scale (Meertens & Lion, 2008)

Instructions

Please indicate the extent to which you agree or disagree with the following statement by putting a circle around the option you prefer. Please do not think too long before answering; usually your first inclination is the best one.

Please use the following scale:

Totally disagree 1 2 3 4 5 6 7 8 9 Totally agree

1. Safety First*
2. I do not take risks with my health*
3. I prefer to avoid risks*
4. I take risks regularly
5. I really dislike not knowing what is going to happen*
6. I usually view risks as a challenge
7. I view myself as a....

Risk avoider 1 2 3 4 5 6 7 8 9 Risk seeker

*Reverse Scored Item

Appendix E

Subjective Knowledge Measure (Flynn & Goldsmith, 1999)

1= Strongly disagree, 4= neither agree nor disagree; 7= strongly agree

1. I know pretty much about *cars*

*2. I do not feel very knowledgeable about *cars*

3. Among my circle of friends, I'm one of the "experts" on *cars*

*4. Compared to most other people, I know less about *cars*

*5. When it comes to *cars*, I really don't know a lot

*Reversed Scored Item

Appendix F

Correlations Table

	Need for Cognition (High, Low)	Subjective Car Knowledge	Risk Propensity	Escalation Total
Need for Cognition (High, Low)	-	.062	-.032	-.090
Subjective Car Knowledge	.062	-	.130**	.030
Risk Propensity	-.032	.130**	-	.031
Escalation Total	-.090	.030	.031	-

**Correlation significant at $p < .01$ level