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I would rather be happy than right: Consumer impulsivity, risky decision making, and accountability

Suzanne Beth Bellman
University of Iowa

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I WOULD RATHER BE HAPPY THAN RIGHT: CONSUMER IMPULSIVITY,
RISKY DECISION MAKING, AND ACCOUNTABILITY

by

Suzanne Beth Bellman

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Interdisciplinary Studies – Ph. D.
degree in Decision Neuroscience in the Graduate College of
The University of Iowa

May 2012

Thesis Supervisor: Professor Irwin P. Levin

ABSTRACT

Consumer impulsivity accounts for a large percentage of purchases yet this aspect of personality is measured with a variety of instruments. Three studies were conducted to examine how measures of consumer impulsiveness relate to each other, other measures of trait level impulsivity, and a variety of decisions and judgments. These studies looked at the relationship between biases resulting from motivated reasoning and the trait of impulsiveness. Motivated reasoning and impulsiveness was considered within the context of consumer and other choice decisions. Consumer impulsivity was found to be related to both general measures of trait level impulsivity as well as containing a lot of content overlap among the three measures considered here. One measure was distinct and formed its own factor in a factor analysis suggesting it may be the most specific measure of consumer impulsivity. The other measures of consumer impulsivity overlapped quite a bit with general impulsivity. The Iowa Gambling Task was used to measure both choice behavior and anticipatory SCR, however no significant results were found. The cups task, a risky decision making task, was also administered and results mirrored classic findings such that participants were more risk averse in the domain of gains than losses. Additionally, both expected value and outcome magnitude influenced results. Individuals who scored higher on the UPPS urgency subscale made more risk advantageous choices when looking at sensitivity to expected value. The third task assessed differences in purchase time for hedonic and utilitarian items. Impulsive consumers reported they would purchase both hedonic and utilitarian items sooner than their less impulsive counterparts.

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Graduate College
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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

Suzanne Beth Bellman

has been approved by the Examining Committee
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To my mother, father, sisters, and family. I have appreciated your support, encouragement, and patience with me during this process.

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ABSTRACT

Consumer impulsivity accounts for a large percentage of purchases yet this aspect of personality is measured with a variety of instruments. Three studies were conducted to examine how measures of consumer impulsiveness relate to each other, other measures of trait level impulsivity, and a variety of decisions and judgments. These studies looked at the relationship between biases resulting from motivated reasoning and the trait of impulsiveness. Motivated reasoning and impulsiveness was considered within the context of consumer and other choice decisions. Consumer impulsivity was found to be related to both general measures of trait level impulsivity as well as containing a lot of content overlap among the three measures considered here. One measure was distinct and formed its own factor in a factor analysis suggesting it may be the most specific measure of consumer impulsivity. The other measures of consumer impulsivity overlapped quite a bit with general impulsivity. The Iowa Gambling Task was used to measure both choice behavior and anticipatory SCR, however no significant results were found. The cups task, a risky decision making task, was also administered and results mirrored classic findings such that participants were more risk averse in the domain of gains than losses. Additionally, both expected value and outcome magnitude influenced results. Individuals who scored higher on the UPPS urgency subscale made more risk advantageous choices when looking at sensitivity to expected value. The third task assessed differences in purchase time for hedonic and utilitarian items. Impulsive consumers reported they would purchase both hedonic and utilitarian items sooner than their less impulsive counterparts.

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CHAPTER ONE

INTRODUCTION

"Reason is, and ought only to be the slave of the passions ..." David Hume (1739)

Although early philosophers speculated about the roles that affect and motivation might play in our cognitive processes, only recently has the longstanding separation of motivation and cognition in the field of psychology begun to crumble. Hume's words foreshadow much of the recent work in psychology, cognitive neuroscience, and business in which modern researchers (e.g., Damasio, 1994; LeDoux, 1996) are recognizing that affect and cognition both have roles to play in decision making and behavior.

Over the last two centuries (i.e., from Hume's time until the current era of research), we see first speculation and eventually evidence that affect plays an integral role in cognition. Zajonc (1980) described the role of affect in decision making by suggesting that our immediate affective reactions to a stimulus occur automatically and then guide subsequent judgments and information processing. Similarly, Damasio (1994) argues that affective reactions or processing guides cognition. Later, Adolphs and Damasio (2001) take this argument a step further by suggesting that affective processing is an evolutionary antecedent to more complex information processing. Specifically, they hypothesized that emotional and cognitive responses occur simultaneously in response to an external stimulus, and information is retrieved from memory during this time.

In keeping with these contributions from the field of neuroscience, several social psychologists have attempted to integrate the roles of a particular cluster of emotions collectively described as motivation with cognition (e.g., Kruglanski, 1996; Kunda, 1990; Pyszczynski & Greenberg, 1987). Most importantly, Kunda articulates in her theory of motivated reasoning the mechanism by which motivation serves as a precursor to cognition (Kunda, 1990). This theory plays a central role in the background of the present work, and will be discussed in greater detail below.

Individual differences in emotional experience and expression are also being more closely examined to determine what role they play in judgment and decision-making (Lauriola & Levin, 2001a; Lauriola & Levin, 2001b; Lowenstein, Weber, Hsee & Welch, 2001). For example, evidence shows that motivation and affect influence judgments (Dunning, 1999; Forgas, 1995; Gollwitzer & Moskowitz, 1996; Kruglanski, 1996; Kunda, 1990). In addition, a specific dimension of emotionality, impulsivity, has been demonstrated to be highly relevant in decision-making. There has been a longstanding effort in the field of personality psychology to both define and measure impulsivity, which has proven to be a broad, multidimensional construct.

We are beginning to understand the importance of impulsivity in consumerism (e.g., buying strategies), with a concomitant emergence of self-report measures of consumer impulsivity (Hausman, 2000; Puri, 1996; Rook & Fisher, 1995; Weun, Jones, & Beatty, 1998). Impulse buying has been found to account for 59% of all purchases (Inman & Winer, 1998) and increasing unplanned point of purchase sales is an important area of emphasis for marketing researchers and retailers. Additionally, extreme impulse buying, sometimes referred to as compulsive buying, can result in severe financial consequences for some individuals. Evidence of these consequences can be seen throughout the media from sources including the internet, television, newspapers, and billboards, which provide individuals with contact information for agencies and support groups to help control impulse buying and reduce debt. Researchers are starting to examine some of the underlying psychological mechanisms which may play an integral role in the dynamics of impulse purchases (e.g., Baumeister, 2002). The present project aims to build on this growing body of research exploring the relationship between affect and cognition with respect to decision-making. In particular, it draws upon the related fields of neuroscience, social and personality psychology, and marketing, and is broadly designed to examine the relationships among consumer impulsivity, impulsivity more generally defined, and motivated reasoning. The study of impulsivity in personality

psychology has a long history, and despite some enduring differences in defining it, the work that has been done can inform and potentially strengthen consideration of impulsivity in the marketing domain. However, to date, measures of consumer impulsivity have not been compared to other more general measures of impulsivity. Furthermore, motivated reasoning (Kunda, 1990) provides one theoretical lens through which to examine how individual differences in impulsivity relate to motivational style.

Motivated Reasoning

Motivated reasoning is a term used to describe the process by which motivation affects behavior via cognition (Kunda, 1990). This view suggests that the processes of motivation and cognition act in tandem (rather than independently) to affect action. Kunda (1990) proposes a distinction between two types of motivational goals that affect reasoning by biasing cognitions. Specifically, they elicit different strategies and beliefs during decision making, impression formation, and attitude formation. *Accuracy goals* are thought to elicit strategies and beliefs that are most appropriate for solving the problem at hand. In contrast, *directional goals* are driven by the motivation to achieve a desired outcome and elicit beliefs and strategies that are most likely to lead to the desired conclusion. These goals are discussed in more detail below. Kunda's (1990) central claim is that these two motivational goals affect reasoning by leading to different processes and by biasing cognitions. Her emphasis is on the divergent reasoning biases that result from these differing goals. However, this is not to say that directional goals are inherently inaccurate (in other words, an individual's directional goal or preferred outcome could be taken to be as accurate as possible) but can coincide. But in general, for the purposes of explicating how directional and accuracy goals affect reasoning, I will be focusing on (as does Kunda) when these two goals do not coincide, but rather differ.

Kunda (1990) cites evidence that accuracy goals elicit more careful processing, although she notes that most of the evidence for careful processing is indirect. However,

she does not then suggest that directional goals are (by contrast) driven by heuristic processing, although she allows for this possibility. Rather, she suggests that when people are driven by directional goals, their reasoning is biased but rational. She proposes that people engage in a justification process in order to achieve the desired goal. Rather than being driven by external, contextual cues, Kunda's (1990) motivated reasoning theory suggests that it is these motivational goals that guide what beliefs and strategies are employed.

People are often unaware of how their own motivations affect their judgments and decision making. Motivated cognition tends to occur beyond awareness, either by activating or inhibiting certain thought patterns. For example, Kunda and Sinclair (1999) have found that stereotypes can be either activated or inhibited by motivation to maintain self-esteem. This, subsequently, biases the information that individuals use to make decisions.

Other researchers have found that goals can also influence individuals outside of their awareness, and both goals and motives operate subconsciously and can be primed (Bargh, 1990; Bargh & Barndollar, 1996; Bargh & Gollwitzer, 1994). On occasion, individuals may be cognizant of their motivations to act in a certain way or to arrive at a particular conclusion. At other times, they are unaware of their motivation. Directional goals (as described by Kunda, 1990) often seem to operate outside of awareness, whereas individuals are generally aware of their cognitions when they are motivated to be accurate.

Accuracy Goals

The distinction between the motivation to arrive at an accurate conclusion versus a desired conclusion has been made by many researchers in addition to Kunda (Kruglanski, 1980; Kruglanski & Ajzen, 1983; Kruglanski & Klar, 1987; Pyszczynski & Greenberg, 1987). For example, Pyszczynski and Greenberg (1987) distinguish between

a motivational and cognitive view that result in differing biases. Specifically, they describe the motivational view as biasing cognitions in order to satisfy needs or desires of the individual. The cognitive view focuses on biases as resulting from inferential and/or rational processes. Kruglanski and Ajzen (1983) differentiate between biases that result from motivational influences versus biases that result from cognitions. Their description of motivational biases is akin to Kunda's directional goals which are typically motivated by needs or desires. Whereas they describe cognitive biases as the result of inferential strategies and heuristics, Kunda (1990) distinguishes her theory of motivated reasoning from the others by suggesting that motivation underlies both forms of resulting biases (whether they are the result of desires or accuracy).

Motivated reasoning is often thought of in terms of how motivation biases our cognitions to achieve a desired outcome. However, this does not mean that cognitions motivated by accuracy (or other goals) are bias-free (Kruglanski, 1989, 2000). Accuracy within the domain of judgment and decision making tends to focus on either social perception or probability estimates (Yates, 1990).

Although Kunda (1990) describes accuracy motivation in general terms, suggesting that individuals are motivated to employ the most accurate strategies for the given situation, this definition can be applied to social perception, as well as more objective decision making or judgment tasks. In general, however, accuracy in likelihood judgments differs from accuracy in judgments of quantities (Yates, 1990). In either type of judgment, determinations of accuracy are based not on a single instance, but rather on a group of instances, so that judgments can be aggregated to form an overall accuracy rating.

Reliance on accuracy goals has been experimentally manipulated by varying the situational context in a number of ways, such as eliciting concerns about control in research participants; including expectations of future interactions, outcome dependency, accountability for judgments, and the importance of judgments (Pitman, 1998; Kunda,

1999). Accuracy has been measured by identifying those individuals who demonstrate an increased interest in and use of available information, examining the complexity of the inferences they draw from the available information, and measuring the amount of time and effort that they spend on a task. Accuracy goals can be increased, or a person may be more prone to be accurate when 1) they are accountable to others or 2) the decision carries important consequences or potential costs (Kunda, 1999). In these instances, individuals put forth an increased effort in their decision making, engaging in more elaborate processing and spending more time considering and reviewing information (Kunda, 1999; Kruglanski, 1980). One way in which accuracy has been manipulated is by asking research participants to justify their responses to an experimenter. This experimental manipulation resulted in increased accuracy (Tetlock & Kim, 1987).

Varying instructions to focus on accuracy (Neuberg & Fiske, 1987) causes participants to rely less on category-based expectancies and more on actual information provided. Neuberg (1989) found that accuracy instructions reduced negative expectations of subjects in mock interview situations in which negative expectations were manipulated. Additionally, subjects participating as interviewers were found to behave in ways that decreased self-fulfilling prophecies of subjects participating as interviewees. Neuberg and Fiske (1987) manipulated outcome dependency (effectively increasing accuracy motivation) by telling participants that they would have future interactions with a hypothetical person that required them to work together. They found that individuals who expected to have the future interaction made more accurate attributions and paid more attention to individuating information than subjects who were not anticipating future interaction. Accuracy instructions have also been found to decrease trait priming effects (Ford & Kruglanski, 1995) and the effects of subliminal priming of traits during impression formation (Thompson, Roman, Moscovitz, Chaiken, & Bargh, 1994). In all of these studies, when motivated to increase their accuracy, participants exhibited fewer attributional biases in their social judgments.

Two questions about accuracy goals will be taken up here. First, I will consider the question of how to extend accuracy into the consumer domain (a domain that does not involve social judgments but more objective judgments). Do certain product selections reflect great accuracy (e.g., utilitarian choices versus hedonic choices)? And, do individuals who describe themselves as more impulsive in terms of their buying behavior make riskier choices in decision making tasks (in other words, less accurate). Second, I will examine the question about the relationship, if any, between accuracy and impulsivity (e.g. whether people who are lower on impulsivity make more accurate choices). This is not to assume that individuals who are impulsive are always inaccurate, but to examine whether or not they demonstrate a tendency to be less accurate than their less impulsive counterparts.

Directional Goals

Directional goals (as described by Kunda, 1990) lead to a preference for reliance on beliefs and decision rules (heuristics) that support a desired outcome. In other words, directional goals tend to cause individuals to arrive at the conclusion that they want to arrive at. The goal of arriving at a particular conclusion or preferred outcome biases one's thinking and judgments (Kunda, 1990).

Directional goals will not influence individuals so much that they become irrational; rather, directional goals influence individuals only as long as they can justify their choices, even if they do so with biased memory searches or heuristics that best support the desired conclusion (Kunda, 1990). Studies have shown that motivation to see oneself in the best light or to maintain self-esteem can result in reliance on directional goals (Dunning, Leuenberger, & Sherman, 1995; Kunda & Sinclair, 1999; Sinclair & Kunda, 1999; Sinclair & Kunda, 2000).

Directional goals, which bias memory searches and decision strategies so that a desired or preferred outcome is reached, are similar to what others describe as biased

predecision processing (for a review, see Brownstein, 2003). Russo, Medvic, and Meloy (1996) call the same phenomenon “predecisional distortion.” Preferences, no matter how tentative, are thought to trigger a biased process of evaluating information so that it favors the preference.

Montgomery (1983; Montgomery & Svenson, 1989) relates pre-decisional distortion to the process of choosing among preliminary “promising alternatives.” This process occurs when a decision maker can save time and effort by selecting a preliminary preferred alternative which results in less load on working memory. It is similar in nature to alternative outcomes, and analogous to the “preliminary alternative” in Differentiation and Consolidation theory (Svenson, 1992, 2003). Svenson’s theory is rooted in both decision theory in the tradition of Abelson and Levi (1985) and social psychology (Festinger, 1957, 1964).

Along similar lines, Ditto and Lopez (1992) have shown that people require less information that supports a desired or preferred conclusion than a non-preferred conclusion. They have also found that the information that is consistent with an individual’s preferred conclusion is less carefully scrutinized than information that does not support their preferred conclusion.

Russo and colleagues have found predecisional distortion in both juror decision making (Carlson & Russo, 2001) and job-relevant tasks (Russo, Meloy, Medvic, & Husted, 1998). Directional goals have also been found to be at work in the consumer domain regarding brand preferences (Chernev, 2001). Specifically, Chernev found that consumers involved in a choice task distorted information in the predecisional stage more when they held even a small preference. Biases manifested themselves by way of differential valuing and weighting of attributes consistent with existing preferences. In a more recent set of studies, Jain (2003) found that information that was inconsistent with preferences was processed in a more biased manner than preference-consistent information.

An affective counterpart to predecisional distortion has been identified by Bechara, Damasio, Tranel, and Damasio (1997). In a decision making task involving risky decisions Bechara et al., (1997) discovered that normal subjects exhibited elevated anticipatory skin conductance responses (SCR) during the period prior to making their decision. It was suggested by these researchers that this affective response to the risky choice acted as a covert influence on reasoning processes in determining which choice was subsequently made. This finding adds strong evidence for influences occurring prior to decisions that the decision maker may not be aware of. Furthermore, collectively the evidence supports the notion that these predecisional influences can be either of a cognitive or affective nature.

Impulsivity

In the field of psychology, both clinical researchers and personality psychologists have a long history of trying to define and measure impulsivity. Historically, impulsivity has been defined as a trait that is characterized by a strong affective component and a simultaneous deficit of cognitive control over behavior. It is often described as an irresistible urge that coincides with a lack of concern for objective reasoning.

Self-report measures have been developed to assess impulsivity as both a lower order trait as well as the broader construct of disinhibition. The general temperament survey (GTS), a self-report measure, was designed to assess broad dispositions or higher order traits (Clark & Watson, 1990; Watson & Clark, 1993), including disinhibition and its opposite, constraint. Watson and Clark (1993) describe the disinhibition versus constraint factor of the GTS as a broad trait factor representing general individual differences in behaving in an undercontrolled versus overcontrolled way. They provide evidence showing that the broad trait of disinhibition is related to a range of activities including drug and alcohol use and other risky behaviors that are also conceptually related to impulsivity. The disinhibition versus constraint factor of the GTS has been

shown to correlate with the conscientiousness (i.e., the ability to inhibit impulses) and agreeableness factors of the Big Five. Specifically, individuals who were high on disinhibition (part of which is impulsivity) were found to also be low on conscientiousness ($r = -.54$) and agreeableness ($r = -.50$) (Clark & Watson, 1999).

Biological Underpinnings of Impulsivity

Gray's Behavioral Inhibition System and Behavioral Approach System. Insofar as the current studies aim to recognize a link between impulsivity and physiological changes (as well as the link between impulsivity in the consumer and psychological domain), it is important to consider the evidence that there is a biological basis for impulsivity. Several accounts of the biological basis for personality and specifically the trait of impulsivity or disinhibition will be reviewed. Jeffrey Gray was one of the early researchers to make the link between biology and personality. His model of personality includes two primary dimensions: anxiety and impulsivity, and theoretical and empirical evidence indicate that both of these dimensions have biological underpinnings (Gray, 1981). Specifically, Gray has specified two theoretical systems (conceptual nervous systems) that are each comprised of different brain structures: the Behavioral Inhibition System¹ and the Behavioral Approach System (BAS; Gray & McNaughton, 1996). According to Gray, anxiety is subsumed by the behavioral inhibition system, and the BAS underlies impulsivity.

Anxiety results from activation of the behavioral inhibition system by stimuli that signal punishment or non-reward, novel stimuli, or stimuli that inherently produce fear. When stimulated, the behavioral inhibition system is responsible for inhibiting motor behavior and increasing an organism's level of arousal (including attention devoted to the

¹ Often referred to as the BIS. However, since I will be using that abbreviation later to represent one measure of consumer impulsivity, reference to Gray's BIS will be spelled out throughout this text.

environment). Because it is theoretically involved in the inhibition of motor responses to stimuli, the behavioral inhibition system plays a role in the attenuation of impulsive behavior.

The existence of the behavioral inhibition system is supported by data from both behavioral and psychopharmacological experiments. First, psychopharmacological studies have repeatedly demonstrated a reduction in anxiety and concomitant decrease in theta rhythm, a measurable index of activity in a region of the behavioral inhibition system known as the septal area (SA), following administration of anxiolytic drugs. Second, lesions to the amygdala (hypothesized to be a key component of the behavioral inhibition system) cause some of the same effects witnessed after the administration of anxiolytic drugs (Gray & McNaughton, 1996).

Gray's (1987) BAS (which Fowles, 1980, p. 90, calls the "behavioral activation system") is responsible for behavioral approach and escape/avoidance. It is responsive to environmental stimuli that warrant 1) approach (where "approach" refers to any behavior that increases the organism's proximity in space or time to the stimuli's occurrence) or 2) escape or avoidance (behavior that decreases the organism's proximity in space or time to the stimuli's occurrence). The first set of stimuli, those that evoke approach behavior, are rewards.

Sensitivity to Reward and Punishment

According to Gray, individual differences in impulsive behavior are affected by variations in sensitivity to environmental rewards and punishments (Gray, 1981). According to classical behavioral theory (i.e., Thorndike's Law of Effect, 1911), behaviors decrease in frequency if they are followed by a punishment (e.g., electric shock or loss of money). In contrast, behaviors that are followed by a reward (e.g., sweets or money) increase in frequency (Thorndike, 1911). Although these rules are universal, individual differences in sensitivity to reward and punishment mediate the effect of these

environmental events upon a given person's behavior. For example, someone who has an overactive behavioral inhibition system and is highly sensitive to punishment will be less likely than their less-sensitive counterpart to repeat a behavior that is followed by adverse consequences. In contrast, an individual who has a strong BAS (and is highly sensitive to reward) will be more likely to repeat a behavior (e.g., a risky gamble) if it has the potential for high pay-off, regardless of the possible adverse consequences.

Reinforcement sensitivity theory. Gray articulated these theoretical individual differences in reward and punishment sensitivity in his reinforcement sensitivity theory (RST; Gray, 1970). According to this theory, the behavioral inhibition system is responsible for sensitivity to punishment and anxiety, whereas the BAS subsumes reward sensitivity and impulsivity. Specifically, individuals with a strong sensitivity to reward (i.e., a strong BAS) readily make approach responses when presented with a stimulus that signals potential reward or relief of punishment. Moreover, individuals who score highly on measures of impulsivity condition more effectively with reward than their non-impulsive counterparts when a number of diverse experimental conditioning paradigms are used (Avila & Parcet, 2000; Corr, Pickering, & Gray, 1995). Avila & Parcet (2002) hypothesize that impulsive individuals allocate more attention to goal-relevant stimuli and concomitantly experience a stronger expectation of reward. After a robust approach response has been learned, impulsive individuals likely over-attend to the goal, thereby limiting response modulation (i.e., processing new information and alternative response options).

Reward expectancies. In keeping with RST, it is hypothesized that the empirical relationship between individual differences in reward sensitivity and behavioral reactions to rewards in experimental paradigms is moderated by reward expectancies (Corr, 2002). In a partial departure from Gray's RST, Corr (2002) predicted that a reward of lower value than expected leads to a state of frustrative nonreward, primarily in reward sensitive (i.e., impulsive) individuals. Additionally, a similar state may be secondarily

induced in punishment sensitive (i.e., anxious) persons. Corr (2002) suggests that results of earlier experiments are not consistently supportive of RST because of a lack of consideration of reward expectancies. He indicates that “frustrative nonreward can produce complex, and difficult to interpret, personality x reward effects in typical human laboratory experiments,” and he suggests that closer consideration of reward expectancies may facilitate interpretation of these data (Corr, 2002, p. 1247).

Other Biological Theories

In addition to Gray’s proposal and work on the potential biological underpinnings of personality, and more specifically impulsivity, there have been other researchers who have also proposed models of personality which include some form of impulsivity that is biologically based. Early models, including Eysenck’s (1967) conceptualization of temperament and personality traits, were biologically based models that focused on the contributing roles of genetics, physiology, and conditioning. Although Gray’s (1987) model represents a bottom up approach, extrapolating from behavior in animals to personality in humans, Cloninger’s (1987) personality model, which is also biologically based, represents a top-down approach based on studies from clinical and personality psychology. Zuckerman (2003) hints at the possibility that the biological underpinnings of personality may be able to be parsed into two broad but basic traits, including impulsivity and sensation seeking, among others, and inhibition/avoidance as the other. He suggests that these may be two broad classes based on their basic biological function.

In describing what he views as the biological basis of personality, Zuckerman (2003) initially notes that individuals differ in sensitivity to stimuli that signal reward or punishment. He identifies this as a basic difference in genetics that predisposes individuals to various behavioral and personality traits. Both Cloninger’s (1987) and Zuckerman’s (2003) descriptions of the biological basis of personality can be traced back to the monoamine neurotransmitters in the brain. Primarily, he refers to norepinephrine,

dopamine, and serotonin. Zuckerman (2003) summarizes the data indicating that these transmitters play a large role in both emotional and cognitive disorders in humans and in the motivational systems of other species. He also suggests that the mesolimbic dopamine system is responsible for a broad approach trait that includes impulsivity and sensation seeking, in addition to extraversion (Zuckerman, 1991). Gray (1987) has also identified this link, although Depue and Collins (1999) have a slightly different view regarding the role that the dopamine system plays in personality, relating it more to extraversion than impulsiveness and sensation seeking.

Despite some differences, it is clear researchers who are approaching personality from a biological standpoint all attribute impulsivity to the same underlying brain systems. We also know that genetics play an important role in contributing to personality traits in general (Eysenck, 1990), including disinhibition (Tellegen et al., 1988). A related construct, temperament, generally refers to predispositions that contribute to personality and are believed to be in part biologically based (Clark & Watson, 1999; Nigg, 2000).

Psychophysiology

Electrodermal activity (EDA), or skin conductance (SC), heart rate (HR), and blood pressure (BP) are all peripheral autonomic measures of cortical activity. Responses on these measures are driven by activity or reactivity in the autonomic nervous system, which are controlled by the limbic system. These measures have been previously used and correlated with various personality traits and stimuli. For example, extroverts have been shown to have stronger SC responses to high intensity stimuli than introverts (Smith, 1983), but introverts show stronger SC responses to low or moderate intensity stimuli (Stelmack, 1990). These were tests of Gray and Eysenck's theories.

In his review of the literature, Fowles (1980) reports that electrodermal activity (EDA, or skin conductance) and heart rate (HR) are unique indicators of behavioral inhibition system and BAS activity, respectively. EDA increases in response to activation

of the behavioral inhibition system (i.e., when the organism is presented with fearful stimuli). However, psychopaths (who are known to score higher on measures of impulsivity relative to normal controls) demonstrate lower EDA in these situations, suggesting that they have weaker behavioral inhibition system's when compared to normal controls. Just as EDA is an index of behavioral inhibition system strength, HR is associated with BAS activity. Although HR is normal in psychopathic individuals (Fowles, 1980), Fowles (1987) suggests that impulsive behavior may result from either strong BAS activity or a weak behavioral inhibition system (or both). Therefore, both the behavioral inhibition system and the BAS are relevant to a discussion of impulsivity (though only EDA is a useful index of impulsivity).

Recently, preliminary evidence of a correlation between cortical underarousal, impulsivity, and Eysenck's psychoticism has been found using EEG and brain imaging techniques (Zuckerman, 2003). Specifically, Zuckerman (2003) describes the augmenting and reducing pattern exhibited by individuals who are either high or low on impulsivity. Individuals who are high on impulsivity have been found to show evidence of augmentation to their cortical responses to stimuli of high intensity relative to low intensity stimuli. In contrast, individuals who are low on impulsivity (and more constrained) exhibit a reduction in cortical arousal in response to stimuli that are of high intensity (Zuckerman, 2003).

Past studies have failed to show a similar relationship between SC and neuroticism (trait anxiety), likely because they typically include individuals who have sub-clinical levels of anxiety since individuals with anxiety disorders do show elevated SC responses (Zuckerman, 2003). It is my contention that impulsivity can be measured with SC during decisions involving uncertain gains and losses, as in the Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994). Although I will be conducting the proposed studies on a sample of individuals who are not clinically classified as psychopaths (i.e., high on impulsivity), the nature of impulsivity in the tasks I am

proposing should elicit differences based on the affective nature of the stimuli, as in the gains and losses faced in the gambling task

Depue (1996) in making his case for the biological underpinnings of personality, cites the fact that behavior develops in response to stimuli and that the brain must be implicated in this in order to recognize the significance of stimuli. These critical stimuli may then also elicit emotions and motivational states stemming from the affective valence and reinforcement properties of the stimulus (Depue, 1996). Depue (1996) describes a behavioral facilitation system (BFS) as an emotional system driven/activated by incentive-reward motivation. This encompasses the approach system previously described by Gray (1970) and the BAS by Fowles (1980) among others. The main points for purposes here are that a similar system is described by several researchers implicating the role of the brain and associated biology in the development and expression of personality and that there is general agreement about an approach system motivated by reward potential.

Depue (1996) suggests that higher order personality traits and emotional and motivational states, associated with general neurobehavioral system constructs, may share a common neurobiology and neurochemistry. Depue (1996) presents data that show the impulsivity factor of constraint is related to activity in the central nervous system. Specifically, impulsivity is linked to activity of serotonin (5-HT) projections, in which individuals with low 5-HT have been found to be more aggressive and impulsive (Depue, 1996). Depue speculates, based on this evidence, that individuals who have low 5-HT or show a general tendency to exhibit impulsive behavior, are likely to be motivated to act in response to immediate rewards despite potential long term adverse consequences. This type of behavior has been documented in individuals who self-report higher scores on Clark and Watson's (1990) GTS and also report greater alcohol and drug use as well as other risky behaviors (Watson & Clark, 1993). Despite the fact that Watson and Clark do not talk about or measure 5-HT, impulsivity and the biological correlates are starting to

be uncovered. Regardless of the specifics and despite their differences, many models of impulsivity/disinhibition, along with the biological models, all point to some common underlying biology as well as attributes or characteristics of impulsivity.

Depue and Collins (1999) suggest that serotonin functioning is associated with affective reactions, cognitions, and behavior, all of which are influenced by a person's constraint. They cite, as evidence of this, the findings that indicate reduced serotonin functioning is associated with low constraint and impulsivity in general (Depue & Collins, 1999).

Individuals who are psychopathic, or diagnosed with antisocial personality disorder, typically demonstrate a lack of emotional reactivity to stimuli associated with punishment (Zuckerman, 2003). This in turn can lead to insensitivity to risks while simultaneously seeking high-intensity rewards. So, by extension it seems likely that even at subclinical levels of impulsiveness we may see a similar tendency in the gambling task. Specifically, individuals who are more impulsive should show a tendency to draw from the riskier decks more often than individuals who are less impulsive.

Electrodermal Hyporeactivity

Electrodermal activity has been reliably correlated with psychopaths who are anticipating receiving aversive stimuli (Fowles, 2000). Specifically, they show hyporeactivity in electrodermal activity prior to receiving known aversive stimuli. Psychopathy, is marked by persons exhibiting highly impulsive behavior and seems to lie on the extreme end of the disinhibition spectrum. They are driven much more by impulses than thoughtful consideration of options. Fowles (2000) notes that electrodermal hyporeactivity is among the most reliable of psychophysiological correlates of psychopathy. In other words, psychopaths, people typically high on impulsivity, have reliably been found to under-react to aversive stimuli that signal some form of punishment. This insensitivity to punishment has been thought to reflect a weak

behavioral inhibition system and a strong behavioral activation system (BAS). While the exact mechanism is not yet known, Fowles suggests that disinhibition is one of three likely candidates responsible for the electrodermal hyporeactivity seen in psychopaths awaiting aversive stimuli. For the purposes here, we will be looking at normal individuals where high impulsivity could be thought of as a less extreme form of psychopathy, but hopefully influential enough to elicit both self-report and behavioral differences.

According to Tranel (2000a) electrodermal activity is among the most popular and informative of psychophysiological measures used to study cognition and emotion. Large amplitude electrodermal responses have been recorded in normal subjects in response to stimuli with strong affective valence (Bradley, Greenwald, Petry, & Lang, 1992; Tranel & Damasio, 1985). Tranel (2000a) reports findings from brain lesion patients who exhibit impulsiveness as a characteristic and fail to show anticipatory psychophysiological responses to choices holding immediate rewards but subsequent punishments. Similar findings have also been reported by other researchers (e.g., Bechara, Damasio, Tranel, Damasio, 1997). Tranel (2000b) further suggests that while self-report measures assess declarative knowledge, or information that is available consciously, skin conductance allows researchers to access both knowledge which may be inaccessible consciously, and autonomic nervous system activation. In a task study of patients with prosopagnosia, Tranel discovered that though the patients had no declarative knowledge to recognize pictures of faces that were familiar to them, they still exhibited SCR's in response to being shown the pictures. This response was interpreted as an indication that the neural system that processes affect laden stimuli (e.g., somatic markers, emotions) is different from the neural system that processes factual information. Considering the aforementioned evidence provides part of the rationale behind measuring electrodermal activity among individuals who vary in impulsiveness during decision tasks. This is important to the studies proposed herein because using the SC responses

may allow us to assess another mechanism influencing decisions in the gambling task described below.

Affect, Decision Making, and Impulsivity

Shiv and Fedorikhin (2002) delineate the processes that a person goes through while making decisions via the affective-cognitive model. Drawing on the theories of LeDoux (1996) and Wyer, Clore, and Isbell (1999), they suggest that upon encountering an affect-laden stimulus, either lower or higher order brain-based affective and cognitive reactions occur. These reactions subsequently activate goals, followed by action tendencies, finally resulting in behavior. Lower order cognitions and affect occur spontaneously after an encounter with an affect-laden stimulus. Activation of lower order cognitions and affect, as proposed by Wyer et al., (1999), inspire action via appetitive and aversive stimuli. This is similar in ways to Gray's behavioral activation and inhibition systems. Wyer et al., (1999) make the point that it is the valence of the stimuli (not the activation of affective versus cognitive routes of processing) that is important in determining which goals and action tendencies are evoked. Therefore, in the case of the proposed lower order route, the basic principles of approach or avoidance will be stimulated based on the valence of the stimuli. Higher order cognitions and affect, on the other hand, are described as being more interpretive in nature. Specifically, they are described as, in a choice scenario, evaluating the potential consequences of the choice at hand (Shiv & Fedorikhin, 2002).

Higher order affective reactions can result when the limbic structures of the brain receive information from the cortical structures (LeDoux, 1996). Notably, the studies proposed in this investigation are designed to examine the role of individual differences (impulsivity and its relationship to accuracy and directional goals) in these lower order processes. Specifically, I will measure the emotional reactivity (i.e., skin conductance) and decisions of individuals who are exposed to affect laden stimuli.

Shiv and Fedorikhin (1999) have examined the role of cognitive load in the cake-salad task. They found that limiting cognitive resources resulted in choices that were driven more by affect than cognition (i.e., the participants tended to choose the chocolate cake). Shiv and Fedorikhin (1999) also used Puri's (1996) Consumer Impulsiveness Scale to examine the role of consumer impulsivity in these experiments. Findings indicated that prudents (individuals lower on impulsivity) tended to be driven more by cognitions. In other words, they chose the fruit salad regardless of whether their cognitive resources were constrained. In contrast, impulsives (individuals who are higher on impulsivity) were more likely to choose the chocolate cake when their cognitive resources were constrained. In subsequent studies Shiv and Fedorikhin also examined the effects of contrasting decision time and cognitive load, and they discovered that participants tended to choose the cake when they 1) had little time in which to make their choice and 2) were under cognitive load (Shiv & Fedorikhin, 2002). The authors concluded that the participants decision was driven by the lower order affect process described in their two-process model.

This finding lays the foundation for several of the research questions included in this investigation. First, I will examine how Puri's Consumer Impulsiveness Scale relates to trait measures of impulsivity, such as lack of planning and spontaneous behavior that were developed within the domains of personality and clinical psychology. Second, I will investigate whether prudents and impulsives experience the same lower order affective reactions toward particular stimuli. Third, I will examine whether or not Puri's (1996) Consumer Impulsivity Scale can predict hedonic and utilitarian choices in a consumer decision-making task.

Consumer Impulsivity

Impulse purchases are a common occurrence and billions of dollars are spent annually on in-store advertising in an attempt to increase impulse buying further (Inman

& Winer, 1998). A 1995 report from the Point of Purchase Advertising Institute finds that over two-thirds of purchase decisions are made in the store. Rook (1987) and Rook and Fisher (1995) suggest that there are differences in the degree to which consumers can control their urge or inclination to make a purchase. Individuals who score high on their buying impulsiveness scale are thought to be less able to control their urges (i.e., more impulsive) to purchase an item than individuals who score lower.

There are many factors that affect in-store purchase decisions (or unplanned purchases). These include both characteristics of the shopping trip (e.g., number of aisles visited, location of in store displays, brand loyalty, major versus minor shopping trip, etc.) and characteristics of the shopper (e.g., demographics, average shopping trips per week, and psychological variables) (Inman & Winer, 1998). For the purposes herein, the discussion will be limited to psychological characteristics (e.g., trait level impulsivity and consumer impulsiveness) of the individual that are proposed to play a role in the number of unplanned or impulse purchases made. Inman and Winer (1998) have examined the role of two psychological variables relevant to this discussion, compulsive buying as articulated by Faber and O'Guinn (1992) and need for cognition (Cacioppo, Petty & Chuan, 1984). The data from 4,200 consumers in 14 U.S. cities was collected by the Point of Purchase Advertising Institute (1995). Compulsive buying and need for cognition were found to be significant predictors of unplanned purchases. Individuals high in compulsiveness and individuals low in need for cognition made more unplanned purchases (Inman & Winer, 1998). The focus here is not on how consumers make in-store purchase decisions, but rather which consumers are most likely to make unplanned (impulse) purchases and how does buying behavior relate to impulsiveness in general.

An important distinction has been made between impulsive and compulsive buying. Compulsive buying has been described by O'Guinn and Faber (1989) more negatively than impulsive buying typically is. Specifically, they describe it as a chronic behavior that occurs in response to negative feelings or events (O'Guinn & Faber, 1989).

They also point out that it is repetitive in nature. Recently compulsive buying has been associated with compulsive disorders rather than impulsivity (Swan-Kremeier, Mitchell, & Faber, 2005). Another important difference is the motivation behind compulsive and impulsive buying. Impulse buying is more often described as a sudden urge to buy something spontaneously, (Rook, 1987; Rook & Fisher, 1995). Impulse purchases are unplanned, occur mainly as a result of proximity to the item, and the suggested motivation rests more on positive outcomes of the purchase, specifically gratification and emotional attraction to the item (Hoch & Loewenstein, 1991; Rook & Fisher, 1987; Weun, Jones, & Beatty, 1998). In this way, impulse buying is more hedonic in nature stemming from a sudden desire to have a specific item, whereas compulsive buying serves more to placate negative emotions such as unhappiness. The motivation for compulsive buying does not seem to be linked to the object (O'Guinn & Faber, 1989). Compulsive buying has also been linked to negative consequences such as accruing sizable debt and frequent binge shopping (Koran, Faber, Aboujaoude, Large, & Serpe, 2006).

Conceptual Overlap Between Motivated Reasoning and Impulsivity

The biases described by Kunda that result from the differing motivations of accuracy versus directional goals seem in many ways similar to the way that people who are high or low on impulsivity would differ from each other. Motivated reasoning has been applied to a wide range of topics, including stereotyping (Sinclair & Kunda, 1999), health-related persuasion (Keller & Block, 1999), depth of processing (Jain & Maheswaran, 2000), and vendor considerations (Park, Sohi, Marquardt, 1997). However, researchers have rarely examined how personality and individual differences might moderate motivation. Specifically, the distinction put forth by Kunda (1990) between accuracy and directional goals seems to correspond with the distinction between

individuals who are high and low on impulsivity (Puri, 1996). Individual differences may moderate the relationship between goals and outcomes. In particular, impulsivity (or consumer impulsivity as defined by Puri, 1996) appears to be a dimension that may be directly relevant to Kunda's (1990) theory of motivated reasoning as applied to decision making. Consumer impulsivity is described by Puri (1996) as a choice that is rewarded with immediate hedonic benefits at the expense of long-term consequences. People who are low on consumer impulsivity ('Prudents') are thought to focus more on consequences, taking more time, and generating more cognitive responses than their more impulsive counterparts (Puri, 1996). This can be viewed as analogous to Kunda's (1990) accuracy goals wherein she suggests more careful processing. 'Impulsives' (or to borrow from Puri, individuals who are high on consumer impulsivity) are thought to be motivated more by their affective reactions rather than cognitions while they are making decisions. By extension, it can be hypothesized that prudents are more likely to be driven by or to activate accuracy goals, whereas impulsives are more likely to be driven by directional goals. Thinking about these two perspectives raises a number of questions that will be empirically examined here.

First, the question whether prudents are more chronically focused on accuracy goals will be investigated (i.e., are they consistently making less risky choices). Second, it is important to determine whether prudents experience the same lower order affective reactions and subsequently adjust (i.e., they then override their affective reactions with cognitions), or they might not experience the same affective intensity as impulsives. Investigation of skin conductance or electrodermal response (EDA), an index of the strength of affective experience, will allow us to begin addressing this question.

CHAPTER TWO
STUDY 1 - COMPARING CONSUMER IMPULSIVITY MEASURES
TO TRAIT LEVEL IMPULSIVITY MEASURES

Objectives

This study was designed to determine whether the two self-report measures of consumer impulsiveness are related to other self-report measures of impulsivity. Puri's (1996) consumer impulsivity scale conceptually has overlap with Kunda's (1990) model of motivated reasoning (described above), but the question remains as to how it relates to other general measures of trait level impulsivity. Specifically I will be comparing the Consumer Impulsiveness Scale (CIS; Puri, 1996) and the Buying Impulsiveness Scale (BIS; Rook & Fisher, 1995) to each other as well as to the UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001) and the Disinhibition subscale of the General Temperament Survey (GTS; Clark & Watson, 1990). The BIS is a more specific measure in that it assesses impulsivity within the context of a consumer oriented domain. Behavior that occurs during purchase or buying interactions represent all of the items on the scale. This study was necessary to determine which measure(s) are the most reliable and valid for measuring consumer impulsivity and for predicting behavior in decision making and consumer behavior research.

Given its relationship to impulsivity, the GTS will be used in the current study to measure disinhibition at the broader level, and the UPPS will be used to measure impulsivity at the narrower trait level. The Big Five Inventory (John, Donahue, & Kentle, 1991) is being administered in part to assess divergent validity. Although Study 1 is more exploratory in nature, with its primary purpose to compare the various measures of impulsivity, several hypotheses can be formed.

Hypothesis 1: The BIS and the CIS will correlate more strongly with one another than will either measure with the GTS or UPPS. This hypothesis is predicated on the fact

that the BIS and CIS were both designed to measure impulsivity in the consumer domain whereas the other measures are broader trait level measures of impulsivity.

Hypothesis 2: The BIS, CIS, UPPS, and Disinhibition subscale of the GTS will all be positively correlated with one another. Despite differences in the specific constructs they are designed to measure, all measure aspects of impulsiveness and, thus, should be positively related.

Hypothesis 3: The CIS prudent subscale is predicted to be negatively correlated with UPPS urgency and GTS carefree orientation subscales. Prudents on the CIS are individuals who are low on impulsivity, who describe themselves as self-controlled and restrained; hence, these individuals should score low on the UPPS urgency and GTS carefree orientation subscales.

Hypothesis 4: The CIS prudent subscale is expected to show a strong positive correlation with conscientiousness on Big Five Inventory, as both reflect a cautious, careful approach to things.

Hypothesis 5: The UPPS urgency subscale is predicted to show a strong positive correlation with the CIS hedonic subscale and with other the BIS measure.

Hypothesis 6: The BIS is expected to form its own unique factor, apart from the general impulsivity scales, whereas the CIS is expected to load on the general impulsivity factor.

Measures

Consumer Impulsiveness Scale

The Consumer Impulsiveness Scale (CIS; Puri, 1996) is a factor-analytically derived measure. It consists of 12 adjectives, 7 of which constitute the prudence subscale and 5 of which constitute the impulsive or hedonic subscale. Participants rate the extent to which the adjectives describe themselves on a seven-point Likert scale (1= usually would describe me, 4 = sometimes would describe me, 7 = seldom would describe me).

Seven of the 12 items are reverse-scored. Representative prudence items include “Self-controlled,” “Restrained,” and “Responsible.” Items on the hedonic subscale include “Careless,” “Easily tempted,” and “Enjoy spending.”

The CIS demonstrates adequate criterion and discriminate validity based on data from two different samples ($n = 75$ and $n = 93$). Puri (1996) found that individuals who score in the direction of impulsiveness (i.e., who receive high scores on impulsiveness and low scores on prudence) indicated that they would spend more money on a tempting but unnecessary purchase than their prudent counterparts. According to Puri’s (1996) scoring scheme, prudents receive an average score of 4.36 on the overall measure, whereas moderates receive a mean score of 3.55 and hedonics score 3.32 on average. Thus, a lower score indicates greater impulsivity. Discriminant validity was tested and results revealed no significant correlations between the CIS and measures of internal locus of control, social desirability, or market knowledge, thus indicating adequate distinction from dissimilar constructs.

Buying Impulsiveness Scale

The BIS (Rook & Fisher, 1995) was designed to measure the tendency to buy things spontaneously and without thinking. The authors describe the buying impulse as a consumer trait not too distant from more broadly defined trait level impulsiveness. The scale is comprised of 9 items which are rated on a 5-pointscale, ranging from *strongly disagree* to *strongly agree*. This scale is specific to a consumer domain and assesses an individual’s tendency to buy things on impulse. The content of all items mention the terms *buy or purchase*. The BIS is a factor analytically derived measure with a mean of 25.1, a standard deviation of = 7.4, and an α of .88 in an undergraduate sample (Rook & Fisher, 1995).

General Temperament Survey

Only the disinhibition scale of the GTS (Clark & Watson, 1990) will be used in this study. This subscale measures trait level tendencies to behave in either an over or under-controlled manner reflecting disinhibition or impulsivity. The scale is comprised of 35 items, and it has two subscales: Carefree Orientation (CO) and Antisocial Behavior (AB). Only the CO subscale is relevant to the present study as it is characterized by items such as, “I don’t pay much attention to where my money goes” and “I am a cautious person.” The GTS scales were factor-analytically derived and it uses a true or false response format. The disinhibition scale of the GTS is negatively correlated with the conscientiousness (-.54) and agreeableness (-.50) subscales of the BFI (Clark & Watson, 1999), and it has been shown to have good stability over time. It is included in this study to assess trait level disinhibition at the broadest level as it subsumes narrower descriptions of types of impulsivity examined herein.

UPPS

The UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001) consists of 45-items, that are rated on a 4-point scale (1 = “I agree strongly,” 2 = “I agree somewhat,” 3 = “I disagree somewhat,” and 4 = “I disagree strongly”). The scale was factor-analytically derived and is designed to assess different facets of impulsive-type behavior. The four scales that comprise the measure, including their coefficient alpha reliabilities and lengths are: (Lack of) Premeditation ($\alpha = 0.91$; 11 items), Urgency ($\alpha = 0.86$; 12 items), Sensation Seeking ($\alpha = 0.90$; 12 items), and (Lack of) Perseverance ($\alpha = 0.82$; 10 items). The items were compiled from existing measures of impulsivity, including the Sensation-Seeking Scales (SSS; Zuckerman, 1994), the Barratt Impulsiveness Scale-11 (BIS-11; Patton, Stanford, & Barratt, 1995), and the Multidimensional Personality Questionnaire Control Scale (MPQ; Tellegen, 1982).

The Big Five Inventory

The BFI (John, Donahue, & Kentle, 1991) is a 44-item self-report measure that is based upon a five-factor model of personality. Five factor models of personality traits represent broad, higher order traits reflective of general dispositions. The BFI includes factors of extraversion (8-items), neuroticism (8-items), agreeableness (9-items), conscientiousness (9-items), and openness (10-items). Items are rated using a 5-point scale ranging from strongly disagree to strongly agree in terms of how true or descriptive they are of the person filling out the questionnaire. The measure was constructed using expert ratings and factor analysis. Items are not single adjectives but more elaborate descriptions which include contextual information. Benet-Martinez and John (1998) report both good alpha reliabilities (.75 - .90) and retest reliabilities ($M = .85$) in two samples. Additionally, the scales have shown low intercorrelations, generally below .20.

Participants

Participants were 518 undergraduate students from a large University in the Midwest. Most participants (66%) were female, 27% were male, and 7% did not indicate sex. Age ranged from 18 to 41 years ($M = 18.68$, $SD = 1.67$). Ninety-one percent of participants were Caucasian. Asian or Pacific Islander constituted 4% of the sample, followed by 1.5% African American, 1.4% mixed ethnicity and 1.2% Latino. The remaining one percent did not indicate ethnicity.

Procedure

Participation was voluntary and served as one form of receiving research credit among students enrolled in an introductory psychology class. After obtaining informed consent, the self-report measures described above were administered in large group testing sessions (i.e., 100-200 students) in a paper and pencil format. Measures for this study were administered to research participants in counterbalanced fashion by research assistants. Research participants spent anywhere from 30 to 60 minutes completing a

packet of materials including questionnaires, personality measures, and decision tasks, during the experimental session. Not all the measures administered were related to the studies described herein.

Missing values on self-report data were left blank for analysis in all three studies. Up to 10% missing data was allowed (Tabachnick & Fidell, 2007). All data points were retained for analysis as none were greater than 4 standard deviations from the mean (Tabachnick & Fidell, 2007).

Results

Reliability of Measures

Most scales showed good internal consistency with the exception of the CIS (see Table A1). Specifically, Cronbach's alpha for the hedonic subscale was .58 and for the prudent subscale .67. Range of alpha's for the other scales was from .72 to .89. Table A1 also includes descriptive statistics for all scales administered in this study.

Correlations

The disinhibition subscale of the GTS showed strong negative correlations with conscientiousness, $r(487) = -.54, p < .01$, and agreeableness, $r(482) = -.31, p < .01$, scales of the BFI. Higher scores on disinhibition were associated with lower conscientiousness and agreeableness scores. There was also a moderately strong positive relationship between the prudent subscale of the CIS and the conscientiousness scale of the BFI, $r(501) = .40, p < .01$, where greater prudence was associated with greater conscientiousness.

The prudent subscale of the CIS was negatively correlated with the both the UPPS urgency subscale $r(461) = -.27, p < .01$, and the GTS CO subscale $r(497) = -.40, p < .01$, (See Table A2). Greater prudence was associated with both less urgency and less carefree orientation.

The BIS showed a strong association with the hedonic subscale of the CIS, $r(426) = -.48, p < .01$. The correlation is negative due to differences in the respective rating scales. High consumer impulsivity, as measured by the BIS, was found to be strongly associated with the tendency to be more hedonic as measured by the CIS. The BIS also showed a modest association with the prudent subscale of the CIS, $r(418) = -.16, p < .01$, where higher impulsivity was associated with low prudence.

Urgency on the UPPS was significantly related to hedonic on the CIS, $r(468) = -.31, p < .01$. Individuals who reported a greater tendency to ‘act without thinking’ also reported being easily tempted and impulsive. The correlation was negative due to the scoring on CIS hedonic subscale wherein lower scores indicate greater hedonic tendencies whereas urgency is scored such that higher numbers indicate greater urgency.

Fisher’s z tests revealed that the BIS and CIS were no more related to each other than they were to either the GTS or urgency subscale of the UPPS, $r's < .59, z's < 1.50, p's > .13$.

Factor Analyses of Impulsivity Items

Analysis was done at the item level in order to examine whether or not the consumer impulsivity items would form their own factor or load onto factors with the trait level impulsivity items. A principal component analysis (PCA) was conducted on 101 items which constitute the UPPS, GTS disinhibition subscale, the CIS, and the BIS. Because the scales were correlated with one another, as seen in Table A3, oblique (promax) rotation was used to rotate the factors. The Kaiser-Meyers-Olkin measure verified the sampling adequacy for the analysis, $KMO = .86$ (‘great’ according to Field, 2009). Bartlett’s test of sphericity, $\chi^2(4950) = 17,683.39, p < .001$ indicated that the correlations between items were sufficiently large for PCA. Although initial analyses revealed that 28 components had eigenvalues over Kaiser’s criterion of 1, examination of the scree plot, minimization of cross loadings, examination of residuals, and factor

interpretability justified retaining 6 factors. Table A3 shows the factor loadings after rotation. Ten items of the 101 items entered into the factor analyses had loadings $<.30$, and thus will not be discussed further. As predicted, the items of the BIS clearly formed their own distinct factor while the items of the CIS were incorporated into other factors. Specifically some CIS items loaded onto the factor formed by the BIS items while the remaining CIS items loaded onto a factor consisting primarily of general disinhibition items from the GTS.

The first factor consisted of items from both the premeditation and (lack of) perseverance subscales of the UPPS. It reflected a combination of items characterized by being thoughtful prior to taking action and being persistent and following through on projects started. The second factor included all the BIS items, a GTS item about impulse buying and several CIS items concerned with being impulsive and enjoying spending money. These items reflect people's tendencies with respect to spending and buying. The third factor consisted of the sensation seeking items from the UPPS. Twenty-two of the 35 items that constitute the GTS formed factor four, characterized by broader disinhibition. The urgency items for the UPPS constituted the fifth factor and reflect how quickly people tend to act. The sixth factor was comprised mainly of items from the CIS that capture how methodical and rational people report being.

Summary of Results

Following is a brief summary of the results of study 1 and how they relate to a priori hypotheses. Discussion of the theoretical implications is contained in the general discussion.

Hypothesis 1: The BIS and the CIS will correlate more strongly with one another than will either measure with the GTS or UPPS. This hypothesis is predicated on the fact that the BIS and CIS were both designed to measure impulsivity in the consumer domain whereas the other measures are broader trait level measures of impulsivity.

Partial support was found for Hypothesis 1 in that there was a strong association found between the BIS and hedonic subscale of the CIS where individuals who reported being high on buying impulsiveness also reported being easily tempted and enjoyed spending money. Although the BIS was related to the hedonic subscale of the CIS as predicted, the CIS hedonic and prudence subscales also had moderately strong associations with disinhibition as measured by the GTS. Higher prudence was associated with less disinhibition which makes sense in that prudence as characterized in the CIS reflects self-control, rational, methodical and disinhibition reflects under-control. On the hedonic subscale low scores reflect a greater tendency to be impulsive, hence the negative correlation wherein greater impulsiveness as measured by the CIS hedonic subscale is associated with higher disinhibition on the GTS a broad measure of impulsivity. The CIS and BIS, however, were no more related to each other, as predicted, than they were to the UPPS urgency subscale or the GTS.

Hypothesis 2: The BIS, CIS, UPPS, and Disinhibition subscale of the GTS will all be positively correlated with one another.

Due to reverse scoring of some of the subscales, not all of the hypothesized relationships are positive but they behaved as predicted. Basically impulsiveness, regardless of measure, is related to other subscales measuring some aspect of impulsivity, e.g., greater urgency in the UPPS is associated with being more hedonic on BIS. The negative relationships appear where expected as well such that greater prudence or being more methodical in approach is associated with less impulsivity regardless of measure.

Hypothesis 3: The CIS prudent subscale is predicted to be negatively correlated with UPPS urgency and GTS carefree orientation subscales. Prudents on the CIS are individuals who are low on impulsivity, who describe themselves as self-controlled and restrained; hence, these individuals should score low on the UPPS urgency and GTS carefree orientation subscales.

This hypothesis is supported by the data. See correlations in Table A2.

Hypothesis 4: The CIS prudent subscale is expected to show a strong positive correlation with conscientiousness on Big Five Inventory, as both reflect a cautious, careful approach to things.

This hypothesis is supported by the data. Greater prudence, being self-controlled and responsible, is associated with being more conscientious (e.g., reliable, thorough) as measured by the BFI.

Hypothesis 5: The UPPS urgency subscale is predicted to show a strong positive correlation with the CIS hedonic subscale and with other the BIS measure.

This hypothesis is only partially supported by the data. The anticipated relationship between urgency and both subscales of the CIS were found. Specifically, greater urgency on the UPPS was associated with being more hedonic and less prudent as measured by the CIS. The CIS measure is very general and the adjectives used on the scale could be applied to a wide range of settings. The data do not support an association between urgency and the BIS. One possible reason for this is that the BIS scale is very specific to buying behavior whereas urgency on the UPPS reflects acting quickly without thinking.

Hypothesis 6: The BIS is expected to form its own unique factor, apart from the general impulsivity scales, whereas the CIS is expected to load on the general impulsivity factor.

The finding was as expected wherein the BIS items formed their own factor characterized by buying behavior tendencies whereas the CIS was more generally dispersed between the factors formed by the BIS and GTS. Support was found for the first part of hypothesis 6 which predicted a coherent factor consisting of items for the BIS. However, support for the prediction that the CIS would be more generally dispersed among the other factors is only partially supported. A majority of the CIS items do hang together in factor 6 while several others load elsewhere.

Summary Study 1

Overall, the results of study one were as expected. The measures of impulsivity are related in the anticipated manner where there are strong associations between types of impulsivity and prudence and conscientiousness is related to low disinhibition as expected. The measures of consumer impulsivity were no more related to each other than they were to the more general trait level measures of impulsivity. The factor analysis suggests that while the BIS items are distinct from the broader measures of trait level impulsivity the CIS items are so general that they become absorbed by factors that characterize the trait level impulsivity measures. This suggests that the CIS may not be as strong of a predictor of impulsive buying behavior as the BIS.

CHAPTER THREE
STUDY 2 - EXAMINING THE RELATIONSHIP BETWEEN
DECISION PROCESSES AND IMPULSIVITY AND INFORMATION
PROCESSING STYLE

Overview

Study two was designed to examine the relationship between decision processes (e.g., choices on the Iowa gambling task and the cups tasks) and impulsivity and information processing style (REI). The goal is to assess whether or not individuals who differ on self-report ratings of consumer and trait impulsiveness as well as rational versus experiential decision making styles differ in terms of their physiologic responses to rewards and punishment in a decision making task. In addition to measuring the physiologic responses on the IGT, choice data from both the IGT and cups task will be examined. Since these two tasks simulate different types of decisions, risky decisions as reflected in the Cups task, and decision under ambiguity as in the IGT they provide a lens to examine whether or not the format (structure) of the decision type plays a role in outcome for individuals who are high or low on impulsivity. The IGT presents the participant with decisions that are ambiguous, in other words, the odds of an advantageous outcome cannot be precisely known. Whereas the cups task presents the decision maker with choices under risk in which the odds of an advantageous decision can be easily calculated/determined by the decision maker. Both tasks are described fully below.

Kunda's (1990) description of the differences between accuracy and directional goals are conceptualized/operationalized in these studies as being somewhat analogous to reliance on rational (less impulsive) versus experiential (more impulsive) processes in decision making. In order to examine whether the trait of impulsivity occurs in tandem with predispositions toward these two types of motivation, I will examine the cognitive

processes individuals rely on to see if they fit with Kunda's (1990) descriptions. That is, do individuals high on impulsiveness tend to rely on strategies characteristic of directional motivation and individuals low on impulsiveness rely on cognitive strategies and processes that are more characteristic of accuracy goals. Additionally, this study will examine whether there are differences in the predictive power of the consumer versus trait impulsivity measures on these decision tasks and which, if any, of these measures are able to reflect the biological/physiological responses.

Objectives

Study 2 was undertaken to examine two primary questions. First, whether or not individuals who are high on impulsivity differ from individuals who are low on impulsivity in terms of their affective reactions toward stimuli during a decision making task. Second, do individual differences in impulsivity predict choice decisions on two different types of decision making tasks. Specifically, I wanted to examine whether or not the consumer measures of impulsivity predict better or worse than the trait level measures of impulsivity. Skin conductance was used to measure physiologic responses on the Iowa Gambling Task (IGT) of affective reactions toward stimuli (Bechara, Damasio, Damasio, and Anderson, 1994) which also measures choice behavior in decisions made under ambiguity. The second task, cups, examined choice behavior under varying levels of risk (Levin & Hart, 2003; Weller, Levin, Shiv, & Bechara, 2007).

The IGT is representative of decisions made under ambiguity where the outcome is unknown, whereas the cups task represents decisions made under uncertainty. In decisions made under uncertainty the probability of various choices is known to the decision maker. The reasoning underlying this study is that measuring physiologic responses should inform us about some of the mechanisms that are driving individual's decisions. Previous research suggests that individuals who are high on impulsivity should not show as strong of anticipatory SC response as individuals who are less impulsive,

given their relative insensitivity to potential punishments in a risky decision task (i.e., the gambling task). Prudents in this task will be expected to be more sensitive to potential punishments as well as exhibit caution in their decisions by selecting the less risky option than individuals who are more impulsive. Administering both types of tasks will allow us to examine whether individuals who are low or high on impulsivity vary in their responses to different decision making domains/environments.

Hypotheses

The hypotheses for Study 2 can be grouped by task (IGT and CUPS), measure (physiologic and choice), and individual differences. I will first present the hypotheses for the additional measures of individual differences and then move on to predictions for the two tasks.

Individual Differences

In Study 2, two additional measures were administered as they were thought to be relevant to constructs being explored. Several hypotheses were presented mainly to ensure that the measures were behaving as expected in relation to the other measures administered.

Hypothesis 7: The UPPS lack of premeditation subscale is predicted to show a strong negative correlation with the REI rational subscale. Individuals who report not doing a lot of thinking in advance of acting were predicted to also have a tendency to think less overall in their approach to things.

Hypothesis 8: The REI rational subscale was predicted to show a strong positive correlation with prudent on CIS. Individuals who report preferring a rational or thoughtful approach were expected to also report being prudent or thoughtful on the CIS measure as they both capture a cognitive approach.

Hypothesis 9: The REI experiential subscale was predicted to show a positive correlation with impulsivity on all measures. Individuals who report a preference for

acting on their gut level feelings, rather than cognitions, were expected to also report higher levels of impulsivity than their more ‘rational’ counterparts.

Iowa Gambling Task

Hypothesis 10: Individuals who are high on trait impulsivity and consumer impulsivity should not show as strong of anticipatory SC responses as individuals who are less impulsive (low impulsivity should show greater anticipatory SC responses than individuals who are high on impulsivity *especially for the bad decks A & B*— because they are more sensitive to punishment than their high impulsivity counterparts).

Hypothesis 11A: Prudents (on the CIS) and individuals high on rationality (REI) were expected to show learning over the trial blocks, with later choices becoming more advantageous, whereas impulsive individuals (on all measures) were predicted not to show as much improvement and continue to make more disadvantageous choices relative to their prudent/less impulsive counterparts.

Hypothesis 11B: Participants were expected to make more advantageous choices in later trial blocks. Learning in the overall sample is an indication that the task is working as it should. Typical response patterns show research participants learning over the course of the five trial blocks.

Hypothesis 12: Individuals high on trait and consumer impulsivity as well as those who score high on the experiential subscale of the REI were predicted to choose from the disadvantageous decks more often (and less often from the advantageous decks) than individuals lower on impulsivity and experientiality. Impulsivity was expected to be associated with riskier choices where both losses and gains are larger but less certain.

Hypothesis 13: Likewise, on the REI, individuals who reported relying on their thoughts more than feelings were expected to make more advantageous choices than individuals lower on rationality.

Cups: Domain

Hypothesis 14: As shown in past research, people have a tendency to be risk averse in the domain of gains and risk taking in the domain of losses (Tversky & Kahneman, 1981). Based on these previous findings, I predict a main effect of domain wherein research participants are expected to be risk averse in the domain of gains and risk seeking in the domain of losses. However, probability level and outcome magnitude were expected to affect this.

Probability and Domain - Gains

Hypothesis 15: Specifically, in the domain of gains with a 1 in 2 chance of winning ($p = .5$) combined with larger payoff possibilities (3 and 5 quarters) research participants were predicted to be risk seeking, given both the good odds of winning along with the higher payoff.

Hypothesis 16: Research participants were expected to be risk averse at the lower probability level, $p = .2$, for gains of 2 and 3 quarters, but risk seeking for gains of 5 quarters.

Losses

Hypothesis 17: In the domain of losses, at $p = .5$ participants were expected to be risk averse at all levels of payoffs, due to the 1 in 2 chance of losing (high) at each level of payoff. However, lower probability levels (.33 and .2) should elicit more risk taking. Individuals with lower impulsivity, higher rationality were expected to take fewer risks at the highest payoff level (not wanting to chance a larger loss – it would be the more conservative choice).

Individual Differences

Hypothesis 18: Higher impulsivity was expected to be positively correlated with overall risk taking.

Hypothesis 19: Individuals who are higher on impulsivity and experientiality were expected to make riskier choices across both gain and loss domains than their less impulsive, more rational counterparts. (main effect)

Hypothesis 20a: Individuals who are higher on trait impulsivity were expected to be riskier in their choices in the domain of gains than they were in the domain of losses.

Hypothesis 20b: Individuals who are higher on consumer impulsivity were expected to be riskier in their choices in the domain of gains than they were in the domain of losses.

Hypothesis 20c: Individuals who are higher in experientiality were expected to be riskier in their choices in the domain of gains than they were in the domain of losses.

Method

Participants

Participants were 80 undergraduate students from a large Midwestern university. Participation was voluntary and served as one form of receiving research credit among students enrolled in an introduction to marketing strategy class. After obtaining informed consent, both the IGT and Cups task were administered via computer after which participants filled out the self-report measures of impulsivity using a paper and pencil format. Due to equipment malfunction, data on the IGT task was only collected for 77 of the research participants, and 79 participants on the Cups task. Participants were run one at a time in order to minimize environmental distractions for collection of the physiologic measure on the IGT. Sixty percent of participants were male (48) and forty percent (32) were female. Age ranged from 19 to 37 years ($M=21.88$, $SD= 2.79$). Participants were primarily juniors (75%) and seniors (24%). 86% of participants were Caucasian with another 9% Asian or Pacific Islander. The remaining 5% were of mixed ethnicity or their ethnicity was not listed on the questionnaire.

Measures

The four self-report impulsivity measures administered in Study 1, UPPS, GTS, CIS and BIS were also used in Study 2. The BIS, CIS, GTS, and UPPS were administered in order to assess the relationship between both the consumer impulsivity measures, trait impulsivity measure and the behavioral as well as physiologic data on the two decision making tasks. Two additional measures were administered in this study, the Rational-Experiential Inventory (REI) (Pacini & Epstein, 1999) and the Impulse Buying Tendency Scale (IBTS) (Weun, Jones, & Beatty, 1998).

Rational-Experiential Inventory

The Rational-Experiential Inventory (REI; Pacini & Epstein, 1999) is a 40-item measure designed to assess cognitive versus more affective processing styles. It tries to directly capture the dilemma between using our heads (what we think) or our hearts (what we feel) in decision making. The scale assesses two different thinking styles, rational and experiential. The rational system operates in conscious awareness, it tends to be slow and analytical, whereas the experiential system tends to operate automatically, quickly, and is associated with affect (Pacini & Epstein, 1999). The scale was factor-analytically derived, has good discriminant validity, and has been shown to predict behavioral outcomes (Pacini & Epstein, 1999). Items are rated on a 5-point scale ranging from definitely not true of myself to definitely true of myself. The REI is expected to be related to the various impulsivity measures in that impulsivity should be positively correlated with higher scores on the experiential subscale. Like with impulsivity, I anticipated differences in the decisions made by individuals who are higher on either rationality or experientiality. Individuals who are higher on rationality were expected to show more advantageous choices on the IGT as well as less risky choices on the cups task than individuals who are lower on rationality. On the surface, the REI seems a

reasonable proxy for motivational style as described by Kunda (1990), however, after more consideration, directional and accuracy goals may mediate thinking style.

The Impulse Buying Tendency Scale

The Impulse Buying Tendency Scale (IBTS; Weun, Jones & Beatty, 1998) is a factor analytically derived self-report measure of the tendency to make unplanned purchases. The authors describe this type of purchase as unintended, made while shopping, and one that did not rely heavily on thought processes. The measure is one-dimensional, consists of 5 items and ratings are made on a 7-point scale ranging from very rarely to very often. Across four studies the authors report coefficient alpha's ranging from .79 to .85.

Since the BIS, CIS, GTS, and UPPS were described in Study 1 I will only be providing the descriptive statistics for those measures here.

Tasks

Iowa Gambling Task

Bechara and colleagues (1994) have developed a behavioral decision making task that mirrors real life decisions in that the outcomes are unknown and involve a certain degree of ambiguity. The gambling task is an ecologically valid test of the ability to factor the uncertainty of an outcome into decision-making (Bechara et al., 1994). Administered via computer, participants are presented with four different decks of cards, each with its own schedule of monetary reinforcement and punishment, and asked to select one card at a time, with the goal of maximizing their "jackpot" over 100 card choices. Research participants do not know how many trials or card selections they will make. The decks appear face down and are labeled ABC and D. Two of the four decks have more moderate gains and losses of money ("good" or advantageous decks; C & D); consistent choices from these decks will result in an overall gain in the jackpot. The other

two decks, by contrast, are "bad" (disadvantageous; A & B) decks, with simultaneous higher gains and losses of money associated with choices. Consistent plays from these disadvantageous decks results in an overall loss of money from the jackpot. Once a card selection is made the card becomes face up to reveal the outcome to participants. A message appears in text format that says how much was won and how much was lost. The participant can then assess whether or not there was a net gain or loss. At the start of the task the computer screen displays graphically, in the form of a green horizontal sliding bar that the participant has \$2,000. to start with. This green bar moves accordingly with each card selection and the resultant gains and losses from card choices.

Individuals who do poorly on this task do so because they are influenced more by the immediate rather than delayed reward: they consistently select from the disadvantageous decks due to the higher potential earning rewards on each individual card, but they still lose more money in the long run.

Physiologic Measure

Palmar skin conductance was recorded by placing two disposable electrodes on each hand. Electrodes were placed on two different fleshy sites on each hand (i.e., over the thenar and hypothenar areas). Skin conductance was recorded throughout the gambling task, and card selections were marked on a time log that is consistent with these recordings. For this study, the recordings captured what has been referred to as the anticipatory phase, which is the time when the participant considers their card choice before a card is selected (Bechara et al., 1999). Although the time between card selections varies with length of time a participant considers their choices, the inter-trial was set to 6 seconds, on average participants spend 10 seconds making their selection (Bechara et al., 1999). Data was collected using a MP100WSsystem (BIOPAC Systems) and analyzed with AcqKnowledge software for mathematical transformations.

Cups Task

Decisions generally involve making a choice among alternatives. In some cases the outcomes are unknown, whereas in other types of decisions, something is known about the potential outcomes. “Decisions under risk,” an example of the latter, occur when the decision maker can assess the probability of any given outcome. Decisions under risk are therefore, relatively more certain than ambiguous decisions (i.e., those made without known probabilities).

The early trials of the IGT can be considered examples of a decision made under ambiguity. The IGT assesses decisions made without knowledge of the outcomes or the chances for reward and punishment, at least during the early trials of the task (Brand, Recknor, Grabenhorst, & Bechara, 2007). Eventually, participants learn that some decks are more advantageous than others, offering lower payoffs combined with less risk of loss (compared to decks that offer larger payoffs and larger losses).

Similar to the IGT, the goal in the cups task is to win as much virtual money as possible. This is done by selecting an inverted cup that is concealing an unknown number of quarters. Unlike the IGT, in which participants must learn which choices are advantageous by trial and error, the cups task provides participants with probability information regarding the number of hidden quarters. Therefore, the cups task is a decision under risk task. The computerized version of this task consisted of 54 trials, half in the domain of gains and half in the domain of loss.

The independent variables were domain (gain or loss), probability or odds (.20, .33, .50; number of overturned cups from which participants selected), and outcome magnitude for the risky option (2, 3, or 5 virtual quarters) versus 1 virtual quarter for the riskless option.

The cups task administered in this study (Levin & Hart, 2003; Weller, Levin, Shiv, & Bechara, 2007) also includes both gain and loss trials that are presented in blocks. Specifically, participants are given on-screen instructions that indicate either that

they have the chance to win (gain trials) or lose (loss trials) quarters. The presentation of gain and loss trials were counterbalanced. Lastly, the cups task requires decision makers to make a choice during the gain and loss trials. Specifically, they choose between either a sure loss or gain of a smaller number of quarters (non-risky option) or they gamble on a chance to win or lose a greater or lesser amount (risky option). For example, in a gain trial decision makers are presented with a choice of either gaining one quarter for sure (non-risky) or taking a 1 in 3 chance to win 3 quarters (risky). This choice appears on the screen as either one overturned cup concealing the sure win on one side of the screen and three overturned cups on the other side of the screen. If the risky choice is made, decision makers select one of the 3 overturned cups, and the contents of the cup (0 or 3) quarters is subsequently revealed. In the loss trials, the decision maker chooses between a sure loss of one quarter (non-risky), or a 1 in 3 chance to lose 3 quarters (risky). The number of cups and quarters vary, with trials containing two, three, or five cups changing the odds of winning or losing. The number of quarters also varies such that in the risky option there are two, three, or five quarters that may be lost or gained. Participants would see and hear the results of their decisions reflected in a bank of quarters displayed at the bottom of the screen in the form of coins either being added or subtracted from their total bank.

Dependent Variables

Two dependent variables of anticipatory SCR were analyzed after mathematical transformation of a function capturing physiologic response 5 seconds prior to card selection. These were average anticipatory SCR prior to selection of a card from the good decks and average SCR prior to selections of cards from the less advantageous decks.

Choice/Card Selections

IGT data were analyzed in two ways, performance by trial block and overall performance. Performance by trial block scores were calculated by subtracting the

number of bad deck selections from the number of selections from good decks for each block of 20 trials of the 100 trials involved in the task. Previous research has shown that most normal participants will adopt an advantageous strategy over the five trial blocks (Bechara, et al, 1999; Denberg et al, 2006). Initially selections may be random but learning across trials about the rewards associated with particular decks of cards often results in more advantageous decisions. Performance by trial block scores above zero indicate advantageous selections.

The second type of behavioral measure analyzed was overall performance. This dependent variable was simply the sum of the trial blocks which yielded an overall performance score wherein scores below zero indicated disadvantageous choices of a net loss of money and scores above zero indicated advantageous choices or a net gain of money.

Cups Task

The dependent variables analyzed in this study directly reflect the a priori hypothesis. Preference shift within the domain of gains and losses was assessed by summing the total number of choices within each domain. This yielded both a total number of risky choices to achieve a gain and avoid a loss.

In order to isolate/examine risk taking, by varying outcome magnitude at probability level $p = .5$, specifically those stated in hypotheses, separate variables were created that summed choices at $p = .5$ with varying levels of outcome magnitude (2, 3, and 5 quarters). Another set of variables was created at $p = .2$ by summing number of risky choices, in the domain of gains, for each of the three levels of outcome magnitude (2, 3, and 5 quarters). These same dependent variables were used in the domain of losses.

Proportion of risky choices was calculated for each of three risk levels, equal EV, risk advantageous wherein the EV of the risky choice is greater than the riskless choice,

and risk disadvantageous wherein the EV of the riskless choice was greater than the risky option.

Two new variables were calculated to assess whether or not impulsive individuals differed from their less impulsive counterparts in ability to discriminate when it was advantageous to take a risk versus when it was not. First, the total number of risky choices on risk advantageous trials was calculated by summing ($p=.5$ and 3 quarters, $p=.5$ and 5 quarters, and $p=.33$ and 5 quarters). Then total number of risky choices in risk disadvantageous trials was calculated ($p=.33$ and 2 quarter, $p=.2$ and 2 quarters, $p=.2$ and 3 quarters). Number of risky choices on disadvantageous trials was then subtracted from the number of risky choices on risk advantageous trials. This was done separately for both the domains of gains and losses.

Results

Individual Differences/Correlations

As predicted, there was a significant negative relationship between premeditation and rationality as measured by the REI, $r(80) = -.27, p = .02$, such that as lack of premeditation (i.e., impulsivity) increased, rationality decreased.

There was a significant positive correlation between rationality as measured by the REI, $r(80) = .34, p < .01$, such that as rationality increases so does prudent as measured by the CIS.

Hypothesis 13 was examined through a series of bivariate Pearson correlations between experientiality and the various measures of impulsivity, (See Table A4). Overall, experientiality was found to be positively related to the other measures of impulsivity. The negative association with hedonic is expected due to reverse scoring of that scale. While the direction of the relationships was as expected, the relationships were very small. Rationality, on the other hand, as measured by the REI showed small to moderate associations with the other measures.

IGT Anticipatory Responses

Checking for multicollinearity, I examined the bivariate Pearson correlations between the measures of impulsivity and average anticipatory responses for both good and bad decks. All of the correlations, except for one (IBTS and BIS), were less than .60, indicating good correlation with one another for subsequent analysis, but not complete overlap/multicollinearity. The correlation between the two measures of consumer impulsivity, IBTS and BIS were correlated at $r(78) = .87, p < .001$, suggesting multicollinearity. The BIS had stronger correlations with the measures of anticipatory responses and was therefore retained for the multiple regression analyses.

Two separate hierarchical multiple regression analyses using simultaneous entry at each block were conducted to examine the impact of trait impulsivity and consumer impulsivity on anticipatory SC for good and bad decks. Measures of trait impulsivity were entered on the first block of the analysis and included: the dis-inhibition subscale of the GTS, UPPS measures of urgency, sensation seeking, premeditation, and perseverance. Measures of consumer impulsivity were entered on the second block of the analysis and included: buying impulsivity (BIS), and the prudent and hedonic subscales of the; anticipatory SC for good, and subsequently for bad, decks was entered as the criterion variable.

Results of the regression analysis for good decks revealed that trait impulsivity did not predict anticipatory SC, $R^2 = .09, F(5, 66) = 1.24, p = .30$. Similarly, the addition of consumer impulsivity did not add anything to the prediction of anticipatory SC, $\Delta R^2 = .09, \Delta F(3, 63) = 2.20, p = .10$. Examination of standardized beta coefficients in the final model revealed that only hedonic (CIS) ($\beta = -.38$) was related to anticipatory SC, with greater hedonism being related to higher anticipatory SC (see Table A5). Examination of collinearity diagnostics (tolerance, variance inflation factor) revealed that multicollinearity was not a problem.

Results were similar for the ‘bad’ decks (see Table A6). Trait level impulsivity did not predict average anticipatory SCR responses on the IGT, $R^2 = .08$, $F(5, 66) = 1.16$, $p = .34$. Again the measures of consumer impulsivity did not add anything to predicting anticipatory SCR, $\Delta R^2 = .06$, $\Delta F(3, 63) = 1.51$, $p = .22$. The final model did not show any of the measures of impulsivity used in this study to be related to anticipatory SCR. Examination of collinearity diagnostics (tolerance, variance inflation factor) revealed that multicollinearity was not a problem.

IGT Choice (Decision Making)

Checking for multicollinearity, I examined the bivariate Pearson correlations between the measures of impulsivity and total IGT performance score. All of the correlations, except for one (IBTS and BIS), were less than .60, indicating good correlation with one another for subsequent analysis, but not complete overlap/multicollinearity. The correlation between the two measures of consumer impulsivity, IBTS and BIS were correlated at $r(78) = .87$, $p < .001$, suggesting multicollinearity. BIS had stronger correlations with the overall performance score and was therefore retained for the multiple regression analyses.

Results of the regression analysis for total IGT performance score revealed that neither trait impulsivity nor REI predicted selection from advantageous decks on the IGT, $R^2 = -.01$, $F(7, 63) = 1.16$, $p = .34$. Similarly, the addition of consumer impulsivity did not add anything to the prediction of performance on the IGT, $\Delta R^2 = .02$, $\Delta F(3, 60) = .53$, $p = .66$. Examination of standardized beta coefficients in the final model revealed that none of the trait impulsivity measures, REI, or consumer impulsivity measures was related to performance on the IGT (see Table A7). Examination of collinearity diagnostics (tolerance, variance inflation factor) revealed that multicollinearity was not a problem.

IGT Choice Trials Over Blocks

Repeated measures analysis of variance (ANOVA) was conducted to determine whether there was a significant change in advantageous choices over the five trials, that is, whether participants learned to make more advantageous choices over course of the task. Mauchly's test of sphericity was significant, indicating that the assumption of homogeneity of variance was violated. As such, the Greenhouse-Geisser estimate was used as the test statistic, as this is the most robust in the face of violations of assumptions. Results indicated significant differences in scores across trials, $F(4, 300) = 7.68, p < .001$, partial $\eta^2 = .09$. Specifically, scores changed from a mean of -2.95 ($SD = 3.83$) on Trial 1, indicating a tendency toward disadvantageous choices, to a mean of 1.32 ($SD = 8.55$) on Trial 5, indicating a tendency toward advantageous choices. Means and standard deviations are reported in Table A8.

A two-way, mixed model analysis of variance (ANOVA) was conducted to determine whether the significant change in advantageous choices observed over the five trials differed for prudent versus impulsive consumers, that is, whether prudent consumers learned to make more advantageous choices over course of the task and whether impulsive consumers learned to make more disadvantageous choices over the course of the task. A median split was done on the CIS prudent subscale, with ties going into the higher category, to examine potential differences in high and low impulsivity. Box's M test for equality of covariance was not significant, indicating that the assumption of homogeneity of covariances was not violated. Results indicated that there were no differences between prudent and impulsive consumers in terms of their learning curves over the course of the task, Pillai's Trace = .08, $F(4, 69) = 1.57, p = .19$, partial $\eta^2 = .08$. Means and standard deviations are reported in Table A9, Figure A1.

Another two-way, mixed model analysis of variance (ANOVA) was conducted to determine whether the significant change in advantageous choices observed over the five trials differed for individuals who reported being more rational according to the REI, that

is, whether more rational individuals learned to make more advantageous choices over course of the task than their less rational counterparts. A median split was done on the rationality subscale of the REI, with ties going into the higher category, to examine potential differences in high and low reliance on rational processes. Box's M test for equality of covariance was not significant, indicating that the assumption of homogeneity of covariances was not violated. Results indicated that there were no differences between individuals who rely more or less on rationality in terms of their learning curves over the course of the task, Pillai's Trace = .05, $F(4, 61) = .84$, $p = .50$, partial $\eta^2 = .05$. Means and standard deviations are reported in Table A10.

Cups: Individual Differences

Pearson product moment correlation was conducted to determine whether there was a significant relationship between various measures of trait impulsivity, consumer impulsivity, rationality, and total risky choices on the cups task. Results indicated that none of the variables was related, $p's > .064$. The UPPS premeditation approached significance, $r(78) = .21$, $p = .064$ such that those lower in premeditation (or more impulsive due to reverse scoring of the subscale) were somewhat more likely to make risky choices than those higher in this trait (see Table A11).

Preference Shift

A repeated measures t test was run to examine whether participants made fewer risky choices in the domain of gains than in the domain of losses. Results indicated that participants did in fact make fewer risky choices in the domain of gains ($M = 16.23$, $SD = 5.63$) than they did in the domain of losses ($M = 19.50$, $SD = 4.37$), $t(77) = -5.15$, $p < .001$ (see Table A12).

An analysis of covariance (ANCOVA) was conducted to determine whether there were significant differences in risky choices across the domains of gains and losses,

controlling for trait impulsivity as measured by the GTS. Mauchly's test of sphericity was significant, indicating that this assumption of homogeneity of covariance was violated. As such, the Greenhouse-Geisser statistic was interpreted, as this is more robust in the face of violations of assumptions. Results indicated significant differences in risky choices across the domains of gains versus losses, $F(1, 73) = 17.12, p < .001$, partial $\eta^2 = .19$, with participants making riskier choices in the domain of losses ($M = 19.37, SD = 4.41$) than in the domain of gains ($M = 16.20, SD = 5.63$). Trait impulsivity was not significantly related to the likelihood of making risky choices in one domain versus the other, $F(1, 73) = 3.75, p = .06$, partial $\eta^2 = .05$, but did evidence a trend in that direction. Follow-up bivariate correlations revealed no significant relationship between trait impulsivity and risky choices in either domain (see Table A13).

Similarly, to assess whether or not there was an effect of consumer impulsivity on risky choices across the domains of gains and losses an analysis of covariance (ANCOVA) was conducted with the CIS prudence subscale. Mauchly's test of sphericity was again significant, indicating that this assumption of homogeneity of covariance was violated. The Greenhouse-Geisser statistic was interpreted, as this is more robust in the face of violations of assumptions. Results indicated significant differences in risky choices across the domains of gains versus losses, $F(1, 74) = 5.02, p = .03$, partial $\eta^2 = .06$, with participants making riskier choices in the domain of losses ($M = 19.58, SD = 4.40$) than in the domain of gains ($M = 16.33, SD = 5.67$). Consumer impulsivity was not significantly related to the likelihood of making risky choices in one domain versus the other, $F(1, 74) = 2.58, p = .11$, partial $\eta^2 = .03$.

The same approach, ANCOVA, was taken in order to assess whether or not there was an effect of experientiality as measured by the REI. Mauchly's test of sphericity was again significant thus the Greenhouse-Geisser statistic was interpreted. Results indicated no differences in risky choices across the domains of gains versus losses when controlling for experientiality $F(1, 76) = .80, p = .37$, partial $\eta^2 < .01$.

Responsiveness to Specific/Predicted Probability and Outcome Information

Domain of Gains

A repeated measures analysis of variance (ANOVA) was conducted to determine whether, for a given probability level ($p = .50$), there was a significant difference in risky choices as a function of payoff possibility; that is, whether individuals would make more risky choices with larger payoffs than with smaller payoffs. For this analysis, Mauchly's test of sphericity was not significant, indicating that the assumption of homogeneity of variance was not violated. Results indicated significant differences in risky choices across payoff possibilities, $F(2, 154) = 15.23, p < .001$, partial $\eta^2 = .17$. Specifically, individuals made more risky choices when the payoff was large ($M = 1.47, SD = 1.22$) or medium ($M = 1.12, SD = 1.20$) than when it was small ($M = 0.73, SD = 1.03$). Means and standard deviations are reported in Table A14.

Another repeated measures analysis of variance (ANOVA) was conducted to determine whether, for the probability level ($p = .2$), there was a significant difference in risky choices as a function of outcome magnitude. Mauchly's test of sphericity was significant thus the Greenhouse-Geisser statistic was interpreted. Results indicated differences between outcome magnitude levels, $F(2, 154) = 11.78, p < .001$, partial $\eta^2 = .13$. Specifically, individuals made more risky choices when the payoff was large ($M = 2.74, SD = .07$) or medium ($M = 2.50, SD = .10$) than when it was small ($M = 2.14, SD = .13$). Means and standard deviations are reported in Table A14.

Domain of Losses

A repeated measures ANOVA was run to assess whether individuals were more risk averse at higher probabilities of losing, in the domain of losses, regardless of outcome magnitude. Mauchly's was not significant. Results indicated significant differences in risky choices across different probability levels, $F(2, 156) = 45.83, p < .001$, partial $\eta^2 =$

.37. Specifically, individuals made fewer risky choices when the probability of losing was greater ($M = 5.33, SD = 2.29$) or medium ($M = 6.51, SD = 2.03$) than when it was smaller ($M = 7.75, SD = 1.47$). Means and standard deviations are reported in Table A15.

Adaptive Decision Making

Two repeated measures ANOVAs were run separately for the domain of gains and losses to examine whether or not adjustments were made across different levels of EV by examining the proportion of risky choices made. In the domain of gains, Mauchly's test of sphericity was not significant and results indicated that proportion of risky choices varied by EV, $F(2, 78) = 97.20, p < .01$, partial $\eta^2 = .56$, with participants making a greater proportion of risky choices in the advantageous ($M = .86, SD = .21$), then equal ($M = .60, SD = .31$), then disadvantageous ($M = .35, SD = .31$).

In the domain of losses, Mauchly's test of sphericity was significant thus the Greenhouse-Geisser statistic was interpreted. Results indicated that, also in the domain of losses proportion of risky choices varied by EV, $F(2, 78) = 59.87, p < .01$, partial $\eta^2 = .44$, with participants making a greater proportion of risky choices in the advantageous ($M = .89, SD = .18$), then equal ($M = .78, SD = .24$), then disadvantageous ($M = .50, SD = .30$).

Sensitivity to Expected Value

Pearson product moment correlation was conducted to determine whether there was a significant relationship between various measures of trait impulsivity, consumer impulsivity, rationality, and risk advantageous scores in both domains of gains and losses.

In the domain of gains, results indicated that individuals who scored higher on the UPPS urgency subscale made significantly more risk advantageous choices, $r(78) = .26, p = .02$. No other forms of impulsivity were significantly related in the domain of gains. In the domain of losses, the hedonic subscale of the CIS was significantly related to risk

advantageous choices, such that individuals who were more hedonic made more accurate (performed better) on the cups task, $r(78) = -.30, p = .01$.

Hypotheses Supported/Falsified

Hypothesis 7: The UPPS lack of premeditation subscale was predicted to show a strong negative correlation with the REI rational subscale. Individuals who report not doing a lot of thinking in advance of acting were predicted to also have a tendency to think less overall in their approach to things.

Support was found for this hypothesis, such that lack of premeditation (impulsivity) was moderately related to the REI rational subscale. As impulsivity increased rationality decreased.

Hypothesis 8: The REI rational subscale was predicted to show a strong positive correlation with prudent on CIS.

Support for this hypothesis was also found such that as rationality increases, prudence also increases as measured by the CIS. Both of these measures capture a cognitive approach to reasoning and so the results are not surprising.

Hypothesis 9: The REI experiential subscale was predicted to show a positive correlation with impulsivity on all measures. Individuals who report a preference for acting on their gut level feelings, rather than cognitions, are expected to also report higher levels of impulsivity than their more 'rational' counterparts.

Here again partial support was found, wherein a reliance on a more experiential processing approach was positively related to most measures of impulsivity. Individuals who reported being higher on impulsivity also reported relying more on their gut feelings in their approach to things.

Iowa Gambling Task

Hypothesis 10: Individuals who are high on trait impulsivity and consumer impulsivity were expected to not show as strong of anticipatory SC responses as individuals who are less impulsive.

This hypothesis was not supported by the data. In both good and bad decks neither trait nor consumer impulsivity was associated with a lower SCR.

IGT Choice Behavior

Hypothesis 11B: We should see learning in the overall sample as an indication that the task is working as it should.

Support for this hypothesis was found, reflecting the standard/expected finding of learning over trial blocks in normal samples. Participants made more advantageous choices in choices later in the task than they made in earlier choices.

Hypothesis 11A: Prudents (on the CIS) and individuals high on rationality (REI) were expected to show learning over the trial blocks, with later choices becoming more advantageous, whereas impulsive individuals (on all measures) were predicted not to show as much improvement and continue to make more disadvantageous choices relative to their prudent/less impulsive counterparts.

This hypothesis was not supported by the data, there were no differences between individuals high and low on consumer impulsivity with regard to learning over trial blocks in choices in the IGT or individuals who reported being higher on the REI rational subscale.

Hypothesis 12 (and 13): Individuals high on trait and consumer impulsivity as well as those who score high on the experiential subscale of the REI were predicted to choose from the disadvantageous decks more often (and less often from the advantageous decks) than individuals lower on impulsivity and experientiality.

This hypothesis was not supported by the data. Neither impulsivity (trait or consumer) or the REI was related to choices on the IGT.

Cups: Domain

Hypothesis 14: Participants were predicted to be risk averse in the domain of gains and risk seeking in the domain of losses.

This hypothesis was supported by the data, as is typical in the cups task as well as decision making research in general.

Probability and Domain - Gains

Hypothesis 15: Specifically, in the domain of gains with a 1 in 2 chance of winning ($p = .5$) combined with larger payoff possibilities (3 and 5 quarters) research participants were predicted to be risk seeking, given both the good odds of winning along with the higher payoff.

This hypothesis was supported by the data. Participants made more risky choices when the outcome magnitude was larger (3 or 5 quarters versus 2) and probability was 50/50. This represents two different types of expected value (EV). In the case of 3 quarters the EV is generally considered risk advantageous and the selection of the risky choice is considered more favorable than the selection of the riskless choice. In the case of 5 quarters at this probability level the EV is considered equal in selection of the risky or riskless choice, at this probability level.

Hypothesis 16: Research participants were expected to be risk averse at the lower probability level, $p = .2$, for gains of 2 and 3 quarters, but risk seeking for gains of 5 quarters.

This hypothesis was also supported by the data such that individuals made more risky choices when the outcome magnitude was large.

Losses

Hypothesis 17: In the domain of losses, research participants were predicted to be more risk averse at higher probabilities of losing (50/50) than at lower probabilities of losing (.33 and .2)

Support for this hypothesis was found, in that participants made riskier choices in the domain of losses at lower probability levels than they did when the possibility of losing was 50/50.

Individual Differences in Cups Task

Hypothesis 18/19: Higher impulsivity and experientiality was expected to be positively correlated with overall risk taking.

Support was not found for this hypothesis as none of the measures of individual differences was related to overall risk taking in the CUPS task.

Hypothesis 20a: Individuals who are higher on trait impulsivity were expected to be riskier in their choices in the domain of gains than they are in the domain of losses.

This hypothesis was not supported by the data. Individuals who were higher on the general trait of impulsivity, as measured by the GTS, were not found to exhibit any differences in risk taking across the domain of gains or losses.

Hypothesis 20b: Individuals who are higher on consumer impulsivity were expected to be riskier in their choices in the domain of gains than they are in the domain of losses.

This hypothesis was not supported by the data. Individuals who reported being higher on consumer impulsivity, as measured by the CIS, were not found to exhibit any differences in risk taking across the domain of gains or losses.

Hypothesis 20c: Individuals who are higher in experientiality were expected to be riskier in their choices in the domain of gains than they are in the domain of losses.

This hypothesis was not supported by the data. Individuals who reported being higher on experientiality, as measured by the REI, were not found to exhibit any differences in risk taking across the domain of gains or losses.

CHAPTER FOUR

STUDY 3 - ASSESSING MEASURES OF CONSUMER AND TRAIT IMPULSIVITY IN A CONSUMER DECISION TASK

Study 3 was designed to assess how well the measures of consumer and trait impulsivity, and REI, predict choice behavior on a consumer task.

While we know that impulse buyers are more susceptible to making unplanned purchases, they may also be inclined to buy certain types of items more often than their less impulsive counterparts. It is not unreasonable to also hypothesize that individuals who are more impulsive also are purchasing items of a more hedonic nature than their prudent counterparts. Conversely, prudent individuals are hypothesized to be likely to buy utilitarian items.

A distinction between hedonic and utilitarian choices and products has already been made by consumer researchers (Hirschman & Holbrook, 1982; Strahilevitz & Myers, 1998; Dhar & Wertenbroch, 2000; O'Curry & Strahilevitz, 2001). Hedonic consumption has been defined as a pleasure-oriented, sensory experience that is accompanied by emotional arousal and it is typically associated with fun and excitement (Hirschman & Holbrook, 1982; Strahilevitz & Myers, 1998). Strahilevitz & Myers (1998) further describe hedonic consumptions as "frivolous" or decadent" and they give examples of ice cream sundaes and vacations. In contrast, utilitarian consumption has been defined as selection of goods that have a useful purpose or function that is deemed necessary for a given task (Hirschman & Holbrook, 1982; Strahilevitz & Myers, 1998).

Several studies have looked at factors that affect hedonic versus utilitarian choices experimentally. Some of the more recently examined influences on hedonic versus utilitarian choices. Some of the more recently examined influences on hedonic versus utilitarian choices have been probability of attaining the item and mode of acquisition (O'Curry & Strahilevitz, 2001). The authors found that hedonic choices were made more

often when the probability of attaining the item was low. Additionally, mode of acquisition had an effect. Hedonic choices were made more often when the item was acquired as a prize, whereas purchase choices were more often utilitarian (O'Curry & Strahilevitz, 2001).

Another study examined how the nature of the decision (i.e., acquisition of an item versus forfeiture of an item) affected hedonic versus utilitarian choices (Dhar & Wertenbroch, 2000). The researchers found that hedonic choices were more common in forfeiture scenarios. Specifically, participants were more likely to make hedonic choices when they were faced with relinquishing the gift certificate that they had previously been given compared to participants who were in an acquisition situation.

Studies such as these are informative, but they do not examine which individuals (e.g., those who receive higher scores on measures of consumer impulsivity) are most likely to make hedonic or utilitarian choices. In order to further assess the utility of the consumer impulsivity measures I examined whether they predict choices between hedonic and utilitarian goods. Similarly, I assessed whether trait measures of impulsivity and the REI predict these types of choices. Although more measures of consumer impulsivity are generated over time, they do not appear to be used in contexts outside of the validation studies or by individuals other than the authors. Therefore, their generalizability is questionable.

In order to assess whether scores on measures of impulsivity or REI predict a preference for hedonic or utilitarian goods I used a task where participants decided when they want to purchase hedonic and utilitarian items, immediately or at a later time. Materials for this task were pilot tested to select items that undergraduate students want and are likely to purchase, as well as to get ratings on whether the items are viewed as utilitarian or hedonic in nature. Drawing on research directly related to motivated reasoning accountability will also be manipulated. Accountability has been shown to increase accuracy goals by encouraging individuals to think more carefully about their

decisions. In general, it was expected that prudents will be far less effected by the accountability manipulation given that they tend to process things more carefully. Hedonics, on the other hand, were expected to be affected by accountability.

Hypotheses

Hypothesis 21: Individuals scoring high on the consumer impulsivity measures were expected to want their products sooner than their less impulsive counterparts, especially the hedonic items.

Hypothesis 22: For utilitarian items, both main effects were expected to be significant, but not the interaction. Hedonics (impulsives) were expected to wait longer to buy utilitarian products than prudents, regardless of accountability. Accountability was expected to result in earlier purchases than no accountability, since it could be used as a way to justify the purchase.

Hypothesis 23: For hedonic items an interaction was predicted. When impulsives buy was expected to depend on level of accountability. Impulsives were expected to wait longer to buy when accountable than when they are not accountable. For prudents accountability was not expected to make a difference in when they buy hedonic items. A similar pattern of results was expected for the REI.

Method

Participants

Participants were 157 undergraduate students from a large University in the Midwest. Most participants (66%) were male, 34% were female. Age ranged from 19 to 31 years ($M = 21.14$, $SD = 1.61$). Ninety-two percent of participants were Caucasian. Asian or Pacific Islander constituted 2.5% of the sample, followed by 1.9% Latino, 1.3% mixed ethnicity and .6% African American. The remaining 1.9% did not indicate ethnicity.

Measures

The same measures of trait level impulsivity (GTS, UPPS) and consumer impulsivity (BIS, CIS, IBTS) used in the previous two studies along with the REI were administered in Study 3.

Procedure

Participation was voluntary and served as one form of receiving research credit among students enrolled in an introductory marketing class at a large University in the Midwest. After obtaining informed consent, the questionnaire about purchase decisions was administered along with a packet containing the self-report measures. The format was paper and pencil. Assignment of accountability conditions was randomized across research participants. The principle investigator administered materials for study 3 which were completed as part of an hour long experimental sessions which also included unrelated computerized tasks for other studies. So not all the measures administered were related to the studies described herein.

Task

A consumer decision making task was developed to assess how long participants reported they would wait until purchasing two basic types of items, hedonic and utilitarian. Participants rated number of days they would wait until purchase for seven of each type of item (hedonic or utilitarian). Examples of items considered hedonic were an iPod or TiVo and items representing utilitarian objects were a vacuum cleaner or microwave. See appendix 3 for complete task. There were 7 of each type of item, hedonic and utilitarian. Accountability was manipulated in the instruction set which appeared as the first thing at the top of the packet of materials. There were two conditions, accountable or not accountable. In the accountable condition participants were asked to “justify their responses” so that we could better understand the rationale underlying their decisions. The not accountable condition had no such instructions at the beginning, rather

participants were simply asked to indicate the length of time they would wait until purchasing the item. Later in the task, all subjects were asked to list the reasons for their decisions. Reasons given were summed for total number of reasons given for each purchase.

Dependent Variables

Consumer Task

Variables were created that averaged number of days research participants were willing to wait until purchase, as well as an average reflecting how much pleasure the items participants would feel as a result of purchasing the item. Hedonic and utilitarian items were grouped separately to create the dependent variables. An average was also created for the number of reasons given to wait until purchase for both hedonic and utilitarian items.

Results

In order to assess whether individuals scoring high on the consumer impulsivity measures reported purchasing these products earlier a series of Pearson correlations was conducted to examine the relationships between the various measures of consumer impulsivity and the number of days until individuals would wait before purchasing hedonic and utilitarian items. Results indicated that, for hedonic items, only the BIS total score evidenced a significant relationship with days wait until purchase, $r(157) = -.16, p = .05$, such that more impulsive consumers reported that they would wait fewer days before purchasing the hedonic items (See Table A16). For utilitarian items, only the CIS Prudence scale showed a significant relationship with days wait until purchase, $r(156) = .17, p = .03$, such that more impulsive consumers reported that they would also wait fewer days before purchasing the utilitarian items. Fisher's exact z test revealed no difference between the correlations for hedonic versus utilitarian items, $z = -0.09, p = .93$.

In other words, impulsive consumers reported that they would wait fewer days before purchasing both hedonic and utilitarian items compared to their less impulsive counterparts.

Pearson correlations were also run to examine the relationship between impulsivity and how much pleasure would result if the item was purchased. Results indicated that for hedonic items, only the UPPS lack of perseverance subscale was related, $r(157) = .17, p < .05$, such that more individuals who reported being lower on perseverance also reported they would feel more pleasure as a result of purchasing hedonic items.

An analysis of covariance was conducted to determine whether accountability had any impact on number of days waited until purchase of utilitarian items, controlling for impulsivity. Levene's test for homogeneity of variance was not significant, indicating that this assumption was not violated. Results indicated no differences in number of days waited until purchase based on accountability when controlling for impulsivity, $F(1, 153) = 0.001, p = .97$, partial $\eta^2 < .001$. Those who were held accountable ($M = 5.95, SE = 0.36$) reported that they would wait the same amount of time as those who were not held accountable ($M = 5.97, SE = 0.36$; see Table A17).

Similarly, an analysis of covariance was conducted to determine whether accountability had any impact on number of days waited until purchase of hedonic items, controlling for impulsivity as measured by the BIS. Levene's test for homogeneity of variance was not significant, indicating that this assumption was not violated. Results indicated no differences in number of days waited until purchase based on accountability when controlling for impulsivity, $F(1, 154) = 0.05, p = .82$, partial $\eta^2 < .001$. Those who were held accountable ($M = 6.14, SE = 0.35$) reported that they would wait the same amount of time as those who were not held accountable ($M = 6.02, SE = 0.36$; see Table A18).

Summary of Results Study 3

Hypothesis Supported and Falsified

Hypothesis 21: Individuals scoring high on the consumer impulsivity measures were expected to want their products sooner than their less impulsive counterparts, especially the hedonic items.

Partial support was found for Hypothesis 21 in that there was a moderate association found between the BIS and number of days individuals report they would wait until purchasing hedonic items. Specifically, they would wait fewer days and purchase sooner than their lower impulsivity counterparts. The CIS prudence subscale was the only self-report measure of impulsivity found to be moderately related to the purchase of utilitarian items. Individuals who were more impulsive, according to this measure reported waiting fewer days until purchase of utilitarian items. While impulsive individuals report waiting less time to purchase than their less impulsive counterparts, whether the item for functional or purchased for pleasure did not make a difference.

Hypothesis 22: For utilitarian items, both main effects were expected to be significant, but not the interaction. Hedonics (impulsives) were expected to wait longer to buy utilitarian products than prudents, regardless of accountability. Accountability is expected to result in earlier purchases than no accountability, since it can be used as a way to justify the purchase.

No support was found for this hypothesis, controlling for impulsiveness, accountability did not affect length of time to purchase for utilitarian items.

Hypothesis 23: For hedonic items an interaction was predicted. When impulsives buy was expected to depend on level of accountability. Impulsives were expected to wait longer to buy when accountable than when they are not accountable. For prudents accountability was not expected to make a difference in when they buy hedonic items.

No support was found for this hypothesis, controlling for impulsiveness, accountability did not affect length of time to purchase for hedonic items.

CHAPTER FIVE

GENERAL DISCUSSION

The goal of study one was to examine the relationship between trait level measures of impulsivity with two measures specifically developed to assess consumer impulsivity. Part of what prompted the investigation was the awareness of several measures of consumer impulsivity existing and being developed in what seemed to be a lack of awareness of what other measures existed in the domain of consumer research or personality psychology. It should be noted that consumer impulsivity as defined in the literature is distinct from compulsive buying which is associated with chronic negative consequences (Swan-Kremeier, Mitchell, & Faber, 2005).

While not surprising, the findings of study one were largely as expected, wherein the measures of trait level impulsivity were related to the measures of consumer impulsivity. Strong associations were found across the domains of types of impulsivity. This included disinhibition at a broad level as measured by the GTS, somewhat less for the four, narrower aspects of impulsivity as measured by the UPPS and the two consumer impulsivity measures. In particular, individuals who reported being higher on general disinhibition also reported being higher on consumer impulsivity. The pattern of relationships is the same across all three samples. All the measures assess some level of spontaneity, acting without thinking, and satisfying desires immediately rather than waiting.

The CIS is very general and other than one specific item, “enjoy spending money,” has no other items related to the domain of consumerism. The traits individuals are asked to rate on the measure could be applied to any domain and are not specific to purchase behavior making it really appear as a more general measure of impulsivity. The CIS, as a measure, was not distinct and was subsumed into the more general measures of trait impulsivity as found in Study one. The BIS is very specific to the consumer domain

such that every item on the 9-item measure contains the word “buy.” It was found to form a distinct factor among all the included measures of impulsivity suggesting it may be the better specific measure of consumer impulsivity. This suggests impulsivity, as measured by the CIS, reflects impulsivity at a broad level. The question remains to what extent we can predict impulsive behavior in specific domains.

Adding the REI and IBTS, in study 2, results were as expected. Specifically, the IBTS was strongly related to the other two measures of consumer impulsivity. The BIS had a moderate association with the experiential scale of the REI, such that individuals who reported being higher on consumer impulsivity also reported relying more on their ‘gut’ feelings. A reliance on rationality, as measured by the REI was moderately associated with prudence on the CIS scale, premeditation and perseverance on the UPPS which makes sense in that they each are characterized by a thoughtful, more careful approach to things. Rationality also had a moderate relationship with impulsivity such that individuals higher on impulsiveness tended to report relying less on a rational, thoughtful approach to things. When the REI was developed it was shown to predict beyond trait level aspects of personality (Pacini & Epstein, 1999). These studies compare the REI to measures of impulsiveness in a fairly obvious way. The REI was developed to capture differences in thinking styles with the rational thought to operate at the conscious level relatively slowly and affect free (CEST, Epstein, 1994). This parallels a prudent approach in consumer impulsivity terms and one characterized by premeditation in term of impulsivity on the UPPS. Similarly, the experiential style is quick and driven in part by emotions which overlaps conceptually with impulsiveness (being quick and acting without thinking). These studies, however, only link the concepts of trait level personality and thinking style but do not determine limits of their relationship or define parameters or constraints in how they function with regard to behavior. More study is needed to determine the conditions in which these aspects of personality operate.

No differences in anticipatory SCR's were found in study 2 among research participants who varied in terms of impulsivity or choices from good or bad decks. Past researchers have found evidence supporting differences in anticipatory responses among healthy individuals (Denburg, et al., 2006; Weller et al., 2006; Miu, Heilman & Houser, 2008), especially prior to choices from disadvantageous decks in the Iowa Gambling Task. The lack of findings here could reflect the general lack of improvement seen in the behavioral or choice aspect of the IGT in this sample. Although the samples herein consisted of normal, healthy adults the average scores on the choice part of the IGT were not as high as those found by other researchers (Denburg, Recknor, Bechara, & Tranel, 2006; Denburg et al., 2009) which could possibly be linked to their lack of affective responses to the stimuli in turn not helping to inform their choices. This is only one hypothetical possibility. This lack of differences in both choice and SCR also means we are unable to draw any conclusions with regard to Gray's 1981 theory of the BAS underlying impulsivity. If differences had been found between SCR and choice behavior on the IGT it may have provided partial evidence for or against the idea that impulsive individuals are driven more by sensitivity to reward and while simultaneously discounting potentially adverse consequences.

Motivated reasoning was hypothesized to be related to impulsivity through directional and accuracy goals. Directional goals were hypothesized to be linked to higher impulsivity and accuracy goals with lower impulsivity. If differences in IGT SCR had been found it would have provided partial support for these individual differences having biological underpinnings as in Gray's (1981) Theory. If differences in IGT choice only (and no differences in IGT SCR) had been found and related to impulsivity then we would have had partial support for the hypothesis that individuals lower on impulsivity are cognitively overriding their affective reactions to stimuli in order to achieve increased accuracy. No support was found in these studies to draw conclusions about physiologic

responses underlying or being linked to the role of affect, cognition, or motivated reasoning.

Regarding choice behavior on the IGT, we did see the standard finding of improved choices across trial blocks. However, as mentioned above, the range of scores was truncated on the high end possibly indicating that participants didn't learn as much or didn't commit to their learning which may have led to better choices overall. If the choices were not facilitated by affective reactions they may not have been as advantageous as they could have been, had affect played a stronger or more observant role as measured by SCR. No relationship was found between impulsivity and disadvantageous choices as predicted. No other associations were found between any of the measures of impulsivity or the REI with regard to advantageous or disadvantageous choices on the IGT. One weakness in the administration of the task was that there were no tangible consequences, meaning nothing to actually win if participants did 'better' on the task. This may have diluted the instruction and incentive to 'win' as much money as you can in the task. While we know that impulsivity is linked to behavioral outcomes in other domains, perhaps the effect, if it exists here at all, is too small to uncover with combination of the IGT and no real consequences. Perhaps having a larger sample that would allow examination of the outer quartiles could be revealing if that subset showed a more clearly defined result of either choice behavior or anticipatory response.

The IGT task represents decisions under ambiguity such that although learning can occur over trials the outcome cannot be accurately predicted, or the odds cannot be calculated in advance of the decisions. The cups task represents a different type of decision making process, typically referred to as decision under risk, wherein the odds of a decision are known to the decision maker in advance. This then, may influence their choice in an advantageous or disadvantageous direction. One classic finding (Khaneman & Tversky, 1979; Levin, Schneider, & Gaeth, 1998) replicated here was that participants were more risk averse in the domain of gains and more risk seeking in the domain of

losses. Specifically, in this study, in the domain of gains at a probability level of .5 individuals made riskier choices in both the risk advantageous (3 quarters) and equal EV (5 quarters) as predicted. However, research participants were also found to be risk averse at $p=.2$ with 2 and 3 quarters. This is in line with a risk-disadvantageous choice as described by Levin, et al., 2007 and Weller et al., 2007. Participants were also found to be risk seeking in the domain of gains at $p = .2$ and 5 quarters as predicted. This specific prediction runs counter to the classic finding of being risk averse in the domain of gains but was predicated on the idea that in this specific instance the fifty percent chance of a large payout was worth the risk. None of this is surprising and simply indicates that individuals are making sense of and incorporating into their choices probability, tradeoffs and outcome magnitude. So overall, in the domain of gains individuals were found to be more risk seeking when there was a greater probability of winning and a larger payoff but more risk averse with smaller probability of winning and smaller payoff.

In the domain of losses, participants were predicted to be more risk averse at higher probabilities of losing ($p = .5$) than at lower probabilities of losing (.33 and .2) and the data supported this hypothesis, Individuals were risk averse at the higher probabilities of losing, regardless of outcome magnitude.

Impulsivity was found to be related to sensitivity to expected value in the Cups task when looking at accuracy of risk taking by domain. In the domain of gains individuals who scored higher on the UPPS urgency subscale made more risk advantageous choices. In the domain of losses individuals who were higher on the hedonic subscale of the CIS performed better or made more risk advantageous choices. What ties the two together is that both of these measures of impulsivity tap speed of acting or decision making. These individuals are likely acting more on their gut level quick assessment of the situation and not likely overthinking it. This may represent an instance when affect is contributing to a 'better' decision when the temptation to think more carefully is less influential in these relatively more impulsive individuals.

Replicating this finding as well as adding a timing mechanism which records length of time to decision would help further uncover if speed of decision really is an underlying factor.

In the cups task as in the IGT the REI was not found to be related to choices. This suggests that since, on average, individuals were able to make sense of the cups data and adjust their choices to be generally advantageous (regardless of scores on the REI) that perhaps for this task they relied more heavily on their rational abilities as captured by the REI to drive their decisions. However, this was not investigated directly so it will need to be left for future studies. Regarding impulsivity, specifically consumer impulsivity, which implies a tradeoff in that purchases or consumption require that something be given up in order to acquire the sought after good – these decisions did not involve any sort of payment on the part of the participant. While they still stood to gain in terms of a game on a computer the fact that they received nothing tangible and gave nothing to acquire it could be factors effecting consumer impulsivity. More research should be done to parse what role, if any, these factors play in consumer impulsivity.

Study 3 applied the various measures of consumer and trait level impulsivity, along with the REI to a consumer decision making task. Participants were asked to make a series of decisions about the length of time until they would purchase two types of items, hedonic and utilitarian. Additionally accountability was manipulated to assess if there were differences in the type of or number of reasons individuals gave. Accountability had no effect in this study and resulted in no differences either in terms of number of reasons given to justify a purchase nor did it effect time until purchase for either hedonic or utilitarian items. The accountability instructions were included as part of the instruction set and they may have been too weak. Furthermore, participants were not subsequently asked if they remembered the instructions or that they would need to justify their responses. Future research looking at differences in content coding of

hedonic versus utilitarian features would add this area of research (Chitturi, Raghunathan, & Mahajan, 2007).

Individuals scoring high on the BIS consumer impulsivity measure wanted their products sooner than their less impulsive counterparts, especially the hedonic items. Specifically, they would wait fewer days and purchase sooner than their lower impulsivity counterparts. The CIS prudence subscale was the only self-report measure of impulsivity found to be moderately related to the purchase of utilitarian items. Individuals who were more impulsive, according to this measure reported waiting fewer days until purchase of utilitarian items. Impulsive individuals reported waiting less time to purchase than their less impulsive counterparts, whether the item was for functional purposes or pleasure did not make a difference. This finding is interesting because it was previously thought that perhaps type of item would influence this. New research in this area (Chitturi, Raghunathan, & Mahajan, 2007) suggests that items have features that are a mix of hedonic and utilitarian which means the issue may be confounded here and further, more specific research will be needed to tease these effects apart (Crowley, Spangenberg, & Hughes, 1993). Other researchers have suggested that consumer impulsivity varies by type of item (Dittmar & Bond, 2010). Years ago, Levin, Schneider, and Gaeth (1998) suggested that different types of framing effects influence what is measured. This series of studies may have tried to address two of the types, risky choice and attribute.

As far as motivated reasoning, no evidence was found in this series of studies to suggest that underlying goals motivated choices or decisions. It was thought at the outset that perhaps low impulsiveness might serve as a proxy for accuracy goals and high impulsivity as a proxy for directional goals but none of the data herein supports these hypotheses or even directly assess them. Individuals low on impulsivity

One other goal of these studies was to more closely examine the role of affect and cognition in decision making. The data from these studies however, paint a somewhat

conflicting picture that will need more research to clarify and articulate the role of both affect and cognition in decision making. Here no links were established between underlying physiologic response, self-report impulsivity measures, or choice behavior. Individuals were found to report they would purchase products sooner than their less impulsive counterparts suggests that emotions and affect do influence at least those individuals higher on impulsivity. However, apparent cognitive processes did not differ in that these individuals did not provide a different number of justifications for those purchases nor did their choice to purchase reflect item type. This further suggests that aspects beyond product type more strongly influence consumer decisions and the fulfillment we experience when purchasing.

As an academic who also works for a business that teaches its participants Kepner-Tregoe (KT) decision making methods, I find myself controlling my own impulsive reactions at times. KT is a process that attempts to take the emotion and impulse out of decisions and instead rely on rational abilities when making decisions. On the one hand, the academic in me clearly values rationality, on the other I cannot ignore (nor do I want to) my affective reactions. “I would rather be happy than right” is meant to capture the feeling that results from the sense of satisfaction that comes from following one’s instincts or impulses. There is something inherently satisfying about following one’s gut feeling, represented in the title by the word happy although this may not be absolutely accurate. Anecdotally, as a person who at times considers myself rational and at times can also be impulsive, sometimes the satisfaction of succumbing to impulse is worth more or feels more satisfying than the joy I feel from being accurate or ‘right.’ While Hume’s words may be a bit extreme he acknowledges the codependent nature of these two, at times, disparate systems, “*Reason is, and ought only to be the slave of the passions ...*” (1739). Although many questions remain, these studies have provided a bit more information about the relationship of consumer impulsivity measures to each other and their role or lack thereof in several decision making tasks.

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APPENDIX A - TABLES

Table A1. *Descriptive Statistics for Personality Measures, Study 1 (N = 518)*

Scale	Subscale	<i>M</i>	<i>SD</i>	α	Range
BIS		22.32	6.07	.89	10-36
BFI					
	Neuroticism	23.65	5.58	.79	9-39
	Extraversion	27.44	5.89	.83	9-40
	Agreeableness	33.83	5.75	.81	13-45
	Conscientiousness	31.69	5.29	.76	16-44
	Openness	33.87	5.61	.73	17-50
CIS					
	Hedonic	16.41	3.14	.58	8-25
	Prudent	23.39	3.87	.67	7-35
GTS					
	Disinhibition	12.88	6.36	.84	0-29
	Carefree Orientation	5.44	2.88	.72	0-13
UPPS					
	Urgency	28.37	5.65	.79	14-45
	Premeditation	24.12	5.75	.85	11-43
	Perseverance	20.89	5.56	.85	10-38
	Sensation Seeking	33.35	6.68	.82	14-48

Table A2. *Correlations Between Impulsivity Measures and Measure of Consumer Impulsiveness, Study 1(N =518)*

<i>Scale / Subscale</i>	BIS	CIS PRUD	CIS HED	UPPS Urg	UPPS Premed	UPPS Persev	UPPS Sens	GTS Dis
<i>CIS</i>								
Prudent	-.16**							
Hedonic	-.48**	.04						
<i>UPPS</i>								
Urgency	.13*	-.27**	-.31**					
Premeditation	.20**	-.37**	-.24**	.10*				
Perseverance	.15**	-.38**	-.17**	.22**	.62**			
Sensation Seeking	-.14**	.02	-.07	.07	-.03	-.32**		
<i>GTS</i>								
Disinhibition	.27**	-.41**	-.38**	.36**	.50**	.45**	.11*	
Carefree Orientation	.23**	-.40**	-.34**	.30**	.44**	.44**	.11*	.88**

Note. BIS = Buying Impulsiveness Scale; CIS Prud = Consumer Impulsiveness Scale Prudent; CIS Hed = Consumer Impulsiveness Scale Hedonic; UPPS Urg = UPPS Impulsive Behavior Scale Urgency; UPPS Sens = UPPS Impulsive Behavior Scale Sensation Seeking; UPPS Premed = UPPS Impulsive Behavior Scale (lack of) Premeditation; UPPS Persev = UPPS Impulsive Behavior Scale (lack of) Perseverance; GTS = General Temperament Survey.

**Correlation significant at the .01 level.

*Correlation significant at the .05 level.

Table A3. *Factor Loadings for Measures of Impulsivity, Study 1 (N = 518)*

Items	Factors					
	I	II	III	IV	V	VI
I tend to value and follow a rational, “sensible” approach to things.	.80					
I usually think carefully before doing anything.	.79					
I usually make up my mind through careful reasoning.	.77					
Before I get into a new situation I like to find out what to expect from it.	.77					
I am a cautious person.	.76		.40			
I don’t like to start a project until I know exactly how to proceed.	.70					
My thinking is usually careful and purposeful.	.70					
I like to stop and think things over before I do them.	.69					
Before making up my mind, I consider all the advantages and disadvantages.	.68					
Unfinished tasks really bother me.	.62					
I generally like to see things through to the end.	.62					
I finish what I start.	.61		.30			
Once I start a project, I almost always finish it.	.60					
I am a productive person who always gets the job done.	.55					
Once I get going on something I hate to stop.	.53		.33			
I’m pretty good about pacing myself so as to get things done on time.	.45					
I am not one of those people who blurt out things without thinking.	.42					
I have a reserved and cautious attitude toward life.	.36		-.30			
“Just do it” describes the way I buy things.		.83				
I often buy things without thinking.		.81				
“I see it, I buy it” describes me.		.79				
I often buy things spontaneously.		.77				
Sometimes I feel like buying things on the spur-of-the-moment.		.74				
Sometimes I am a bit reckless about what I buy.		.73				
“Buy now, think about it later” describes me.		.72				
I buy things according to how I feel at the moment.		.67				
I am not an “impulse buyer.”		.53				
Enjoy spending money		-.53				
Impulsive		-.43				
I carefully plan most of my purchases.		.36				
Extravagant		-.33				
Easily tempted		-.32				
I quite enjoy taking risks.			.73			
I sometimes like doing things that are a bit frightening.			.69			
I would enjoy parachute jumping.			.66			

Table A3 Continued

Items	Factors					
	I	II	III	IV	V	VI
I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.			.64			
I would enjoy the sensation of skiing very fast down a high mountain slope.			.57			
I'll try anything once.			.56			
I would enjoy fast driving.			.54			
I would enjoy water skiing.			.52			
I generally seek new and exciting experiences and sensations.			.51			
I would like to learn to fly an airplane.			.48			
I like sports and games in which you have to choose your next move very quickly.			.47			
I would like to go scuba diving.	.34		.47		.35	
I tend to give up easily.			.35			
I'll take almost any excuse to goof off instead of work.				.62		
I've done a lot of things for which I could have been (or was) arrested.				.59		
I really enjoy beating the system.				.57		
If I had to choose, I would prefer having to sit through a long concert of music I dislike to being in a bank during an armed robbery.				.51		
I get the most fun out of things that others think are immoral or illegal.				.51		
I often get out of things by making up good excuses.				.50		
The way I behave often gets me into trouble on the job, at home, or at school.				.48		
I work just hard enough to get by.				.45		
If I had to choose, I would prefer being in a flood to unloading a ton of newspapers from a truck.				.44		
When I resent having to do something, I sometimes make mistakes on purpose.				.44		
I spend a good deal of my time just having fun.				.43		
When I decide things, I always refer to the basic rules of right and wrong.				.41		
I would much rather party than work.				.41		
I have stolen things from time to time.				.40		
I would not use others' weaknesses to my own advantage.				.37		
I've been told that I work too hard.				.37		
I rarely, if ever, do anything reckless.				.35		
Lying comes easily to me.				.34		
I always try to be fully prepared before I begin working on anything.				.34		

Table A3 Continued

Items	Factors					
	I	II	III	IV	V	VI
I often stop in the middle of one activity to start another one.				.33		
I am a cautious person.				.33		
When I'm having a good time, I don't worry about the consequences.				.32		
When I am upset I often act without thinking.					.72	
Sometimes I do things on impulse that I later regret.					.68	
I often make matters worse because I act without thinking when I am upset.					.68	
When I feel rejected, I will often say things I later regret.					.67	
In the heat of an argument, I will often say things that I later regret.					.65	
When I feel bad, I will often do things I later regret in order to make myself feel better now.					.57	
I have trouble controlling my impulses.					.46	
Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.					.45	
I often get involved in things I later wish I could get out of.					.44	
It is hard for me to resist acting on my feelings.	.32				.44	
There are so many little jobs that need to be done that I sometimes just ignore them all.					-.33	
I have trouble resisting my cravings (for food, cigarettes, etc.).					.32	
Methodical						-.68
Rational						-.55
A planner						-.53
Farsighted						-.46
Before I make a decision I carefully consider all sides of the issue.						.45
Self-controlled						-.42
Restrained						-.39
I believe in playing strictly by the rules.						.35
I usually use careful reasoning when making up my mind.						.34
I am a serious-minded person.						.31
Taking care of details is not my strong point.						.30

Note. Factor loadings > .35 are shown in bold. Factor loadings < .30 have been omitted.

Table A4. *Correlations Between Impulsivity and Consumer Impulsiveness, Study 2*

	2	3	4	5	6	7	8	9	10	11
1	.14	-.15	-.28*	.34**	.24*	-.29*	-.28*	.30**	-.27*	-.42**
2		.30**	.29**	.07	-.12	.29*	.07	.12	.16	.01
3			.87**	-.39**	-.58**	.46**	.32**	.18	.55**	.24*
4				-.44**	-.59**	.59**	.41**	.14	.57**	.33**
5					.45**	-.45**	-.38**	.06	-.57**	-.48**
6						-.54**	-.47**	-.14	-.45**	-.27*
7							.32**	.30**	.58**	.46**
8								-.20	.17	.45**
9									.16	-.26*
10										.43**

Note. 1 = Rational Experiential Inventory (REI) Rational; 2 = REI Experiential; 3 = Weun Impulsivity Scale; 4 = Buying Impulsiveness Scale; 5 = Consumer Impulsiveness Scale (CIS) Prudent; 6 = CIS Hedonic; 7 = General Temperament Survey; 8 = UPPS Impulsive Behavior Scale (UPPS) Urgency; 9 = UPPS Sensation Seeking; 10 = UPPS Premeditation; 11 = UPPS Perseverance; *Ns* ranged from 73 to 80.

* denotes $p < .05$

** denotes $p < .01$

Table A5. Hierarchical Multiple Regression Analysis Results for the Effects of Trait and Consumer Impulsivity on Anticipatory SC for Good Decks ($N = 72$)

Model / Predictor	B (SE)	β	Part r	t
<i>Model 1: $R^2 = .09$</i>				
UPPS-Urgency	-0.01 (0.01)	-.19	-.17	-1.46
UPPS-Sensation Seeking	0.001 (0.01)	.02	.01	0.11
UPPS-Premeditation	-0.02 (0.01)	-.26	-.21	-1.78
UPPS-Perseveration	0.01 (0.02)	.08	.06	0.48
GTSTOT	0.02 (0.01)	.28	.20	1.70
<i>Model 2: $R^2 = .17$</i>				
UPPS-Urgency	-0.02 (0.01)	-.29	-.22	-1.90
UPPS-Sensation Seeking	<0.001 (0.01)	-.002	-.001	-0.01
UPPS-Premeditation	-0.02 (0.01)	-.26	-.17	-1.51
UPPS-Perseveration	0.01 (0.02)	.14	.10	0.90
GTSTOT	0.01 (0.01)	.24	.16	1.42
BISTOT	-0.01 (0.01)	-.23	-.16	-1.42
CISPRUD	0.004 (0.01)	.06	.05	0.42
CISHED	-0.03 (0.01)	-.38	-.27	-2.39*

Note. GTSTOT = General Temperament Survey; CISPRUD = Consumer Impulsiveness Scale (CIS) Prudent; CISHED = CIS Hedonic.

* denotes significant p value ($p < .05$).

Table A6. *Hierarchical Multiple Regression Analysis Results for the Effects of Trait and Consumer Impulsivity on Anticipatory SC for Bad Decks (N = 72)*

Model / Predictor	B (SE)	β	Part <i>r</i>	<i>t</i>
<i>Model 1: R² = .08</i>				
UPPS-Urgency	-0.01 (0.01)	-.18	-.16	-1.36
UPPS-Sensation Seeking	<0.001 (0.01)	.01	.01	0.05
UPPS-Premeditation	-0.02 (0.01)	-.25	-.20	-1.71
UPPS-Perseveration	0.003 (0.02)	.03	.02	0.19
GTSTOT	0.02 (0.01)	.28	.20	1.71
<i>Model 2: R² = .14</i>				
UPPS-Urgency	-0.01 (0.01)	-.22	-.17	-1.44
UPPS-Sensation Seeking	<-0.001 (0.01)	-.01	-.01	-0.08
UPPS-Premeditation	-0.01 (0.01)	-.21	-.14	-1.17
UPPS-Perseveration	0.01 (0.02)	.08	.06	0.47
GTSTOT	0.02 (0.01)	.28	.19	1.62
BISTOT	-0.01 (0.01)	-.24	-.17	-1.47
CISPRUD	0.01 (0.01)	.09	.07	0.56
CISHED	-0.02 (0.01)	-.29	-.21	-1.76

Note. GTSTOT = General Temperament Survey; CISPRUD = Consumer Impulsiveness Scale (CIS) Prudent; CISHED = CIS Hedonic.

* denotes significant *p* value (*p* < .05).

Table A7. Hierarchical Multiple Regression Analysis Results for the Effects of Trait and Consumer Impulsivity on Advantageous Versus Disadvantageous Choices ($N = 71$)

Model / Predictor	B (SE)	β	Part r	t
<i>Model 1: $R^2 = .09$</i>				
UPPS-Urgency	-0.46 (0.46)	-.14	-.12	-1.00
UPPS-Sensation Seeking	0.51 (0.56)	.14	.11	0.93
UPPS-Premeditation	-0.68 (0.64)	-.16	-.13	-1.06
UPPS-Perseveration	1.10 (1.02)	.18	.13	1.08
GTSTOT	0.14 (0.68)	.04	.03	0.21
REIRATIONAL	2.28 (6.45)	.05	.04	0.35
REIEXPERIENTIAL	-7.98 (5.50)	-.19	-.18	-1.45
<i>Model 2: $R^2 = .11$</i>				
UPPS-Urgency	-0.27 (0.55)	-.08	-.06	-0.49
UPPS-Sensation Seeking	0.56 (0.57)	.15	.12	0.98
UPPS-Premeditation	-0.64 (0.80)	-.15	-.10	-0.79
UPPS-Perseveration	0.85 (1.06)	.14	.10	0.80
GTSTOT	0.27 (0.74)	.07	.05	0.37
REIRATIONAL	2.23 (6.64)	.05	.04	0.34
REIEXPERIENTIAL	-8.23 (5.77)	-.20	-.17	-1.43
BISTOT	0.31 (0.53)	.11	.07	0.58
CISPRUD	-0.10 (0.78)	-.02	-.02	-0.12
CISHED	1.01 (0.85)	.21	.14	1.19

Note. GTSTOT = General Temperament Survey; REIRATIONAL = Rational Experiential Inventory (REI) Rational; REIEXPERIENTIAL = REI Experiential; CISPRUD = Consumer Impulsiveness Scale (CIS) Prudent; CISHED = CIS Hedonic.

* denotes significant p value ($p < .05$).

Table A8. *Summary of Means, Standard Deviations, and F Ratios from Repeated Measures ANOVA, IGT Trial Block, S2 (N = 76)*

Trial	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	partial η^2
			7.68	<.001	.09
Trial 1	-2.95	3.83			
Trial 2	-0.55	5.02			
Trial 3	-0.45	6.63			
Trial 4	1.45	8.13			
Trial 5	1.32	8.55			

Table A9. *Summary of Means, Standard Deviations, and F Ratios from Repeated Measures ANOVAs: IGT Choices as a Function of Consumer Impulsivity and Trial Block, S2 (N = 74)*

<i>Consumer / Trial</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
			1.57	.19
<i>Prudent</i>				
Trial 1	-3.03	4.18		
Trial 2	-1.33	4.84		
Trial 3	-0.51	5.80		
Trial 4	1.23	8.14		
Trial 5	2.63	8.04		
<i>Hedonic</i>				
Trial 1	-3.03	3.51		
Trial 2	0.34	5.28		
Trial 3	-0.51	7.66		
Trial 4	1.54	8.81		
Trial 5	-0.23	9.19		

Table A10. *Summary of Means, Standard Deviations, and F Ratios from Repeated Measures ANOVAs: IGT Choices as a Function of REI Rational Ability and Trial Block (N = 76)*

<i>Consumer / Trial</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
			0.84	.50
<i>High Rational</i>				
Trial 1	-2.90	3.83		
Trial 2	-0.14	5.90		
Trial 3	0.29	6.38		
Trial 4	1.52	8.44		
Trial 5	2.62	7.94		
<i>Low Rational</i>				
Trial 1	-3.00	3.88		
Trial 2	-1.06	3.69		
Trial 3	-1.35	6.91		
Trial 4	1.35	8.28		
Trial 5	-0.29	9.11		

Table A11. *Correlation Matrix for Relationships Between Personality Traits and Risky Choices on Cups Task, S2*

	1	2	3	4	5	6	7	8	9	10	11
Risky choices	.25*	.08	.01	-.03	-.06	.11	.08	.21	-.01	.01	-.02

Note. 1 = [UPPS] (UPPS) Urgency; 2 = UPPS Sensation Seeking; 3 = UPPS Premeditation; 4 = UPPS Perseverance; 5 = General Temperament Survey Total; 6 = Rational Experiential Inventory (REI) Rational; 7 = REI Experiential; 8 = Weun Impulsivity Scale Total; 9 = Buying Impulsiveness Scale Total; 10 = Consumer Impulsiveness Scale (CIS) Prudent; 11 = CIS Hedonic; *Ns* ranged from 76 to 78.

* denotes significant *p* value ($p < .05$).

Table A12. *Repeated Measures t Test: Risky Choices in Cups Task as a Function of Domain, S2 (N = 78)*

Domain	M	SD	<i>t</i>	<i>p</i>
Gains	16.23	5.63	-5.15	<.001
Losses	19.50	4.37		

Note. * denotes significant *p* value ($p < .05$).

Table A13. *Analyses of Covariance (ANCOVA): Risky Choices in Cups Task as a Function of Domain (Adjusted for Trait Impulsivity) S2 (N = 75)*

Impulsivity / Domain	M (SD)	Adj. M (SE)	F	p	Partial η^2
GTSTOT					
Gains	16.20 (5.63)	16.20 (0.65)	17.21	<.001*	.19
Loss	19.37 (4.41)	19.37 (0.51)			
Trait impulsivity	10.84				
CISPRUD					
Gains	16.33 (5.67)	16.33 (0.65)	5.02	.03*	.06
Loss	19.58 (4.40)	19.58 (0.50)			
Trait impulsivity	19.17				
REIEXPERIENTIAL					
Gains	16.23 (5.63)	16.20 (0.64)	0.01	.92	<.001
Loss	19.50 (4.37)	19.37 (0.50)			
Trait impulsivity	3.54				

Note. GTSTOT = General Temperament Survey Total; CISPRUD = Consumer Impulsivity Scale Prudent; REIEXPERIENTIAL = Rational Experiential Inventory Experiential.

* denotes significant *p* value ($p < .05$).

Table A14. *Repeated Measures ANOVA: Risky Choices in Domain of Gains, in Cups Task, as a Function of Payoff at Different Probabilities, S2 (N = 78)*

Payoff	<i>M</i>	SD	<i>F</i>	<i>p</i>
<i>p</i> = .50				
2 quarters	0.73	1.03	15.23	<.001*
3 quarters	1.12	1.20		
5 quarters	1.47	1.22		
<i>p</i> = .20				
2 quarters	2.14	1.14	11.78	<.001*
3 quarters	2.50	0.88		
5 quarters	2.74	0.61		

Note. * denotes significant *p* value ($p < .05$).

Table A15. *Repeated Measures ANOVA: Risky Choices in Domain of Losses, in Cups Task as a Function of Probability Level, S2 (N = 78)*

Probability Level	M	SD	F	p
$p = .20$	7.75	1.47	45.83	<.001
$p = .33$	6.51	2.03		
$p = .50$	5.33	2.29		

Table A16. Correlation Matrix for Consumer Impulsivity and Days Until Purchase, Likelihood of Purchasing, and Pleasure From Purchasing Hedonic and Utilitarian Items in a Consumer Decision Making Task, S3

	IBTS	PRUD	HED	BIS	PREMED	PERSEV	SENS	URG	RAT	EXP
Days HED	-.07	.14	.08	-.16*	-.07	-.09	.04	-.04	.11	.04
Days UTIL	.04	.17*	.01	-.04	-.03	-.11	.05	-.02	.05	.08
Likely HED	.01	-.03	-.11	.05	.18*	.15	-.01	.08	-.07	-.05
Likely UTIL	.06	-.10	-.09	.06	.01	.10	-.06	-.001	-.04	-.08
Pleas HED	.08	-.03	-.05	.06	.14	.17*	-.01	-.05	-.06	.03
Pleas UTIL	-.02	-.03	.10	-.05	-.01	-.03	.02	-.14	-.07	.02

Note: IBTS = Weun Impulsivity Scale total score; PRUD = Consumer Impulsiveness Scale Prudence score; HED = Consumer Impulsiveness Scale Hedonic score; BIS = Buying Impulsiveness Scale total score; PREMEDI = UPPS Impulsive Behavior Scale Premeditation score; PERSEV = UPPS Impulsive Behavior Scale Perseveration score; SENS = UPPS Impulsive Behavior Scale Sensation Seeking score; URG = UPPS Impulsive Behavior Scale Urgency score; RAT = Rational Experiential Inventory Rationalability score; EXP = Rational Experiential Inventory Experientiality score; Days HED = days until purchase hedonic items; Days UTIL = days until purchase utilitarian items; Likely HED = likelihood of purchasing hedonic items; Likely UTIL = likelihood of purchasing utilitarian items; Pleas HED = pleasure from purchasing hedonic items; Pleas UTIL = pleasure from purchasing utilitarian items. *Ns* ranged from 154 to 157.

* denotes significant *p* value ($p < .05$).

Table A17. Analysis of Covariance (ANCOVA) Results for Number of Days Waited Until Purchase Utilitarian Items as a Function of Accountability (Adjusted for Impulsivity) in a Consumer Decision Making Task, S3 (N = 156)

Accountability	M (SD)	Adj. M (SE)	F	p	Partial η^2
Accountable	5.89 (3.16)	5.95 (0.36)	0.001	.97	<.001
Not accountable	6.03 (3.23)	5.97 (0.36)			
Impulsivity	35.53				

Note. Impulsivity measured by the Consumer Impulsivity Scale Prudence score.

Table A18. Analysis of Covariance (ANCOVA) Results for Number of Days Wait Until Purchase Hedonic Items as a Function of Accountability (Adjusted for Impulsivity) in a Consumer Decision Making Task, S3 (N = 157)

Accountability	M (SD)	Adj. M (SE)	F	p	Partial η^2
Accountable	6.06 (3.06)	6.14 (0.35)	0.05	.82	<.001
Not accountable	6.10 (3.23)	6.02 (0.36)			
Impulsivity	23.54				

Note. Impulsivity measured by the Buying Impulsiveness Scale total score.

APPENDIX B - FIGURES

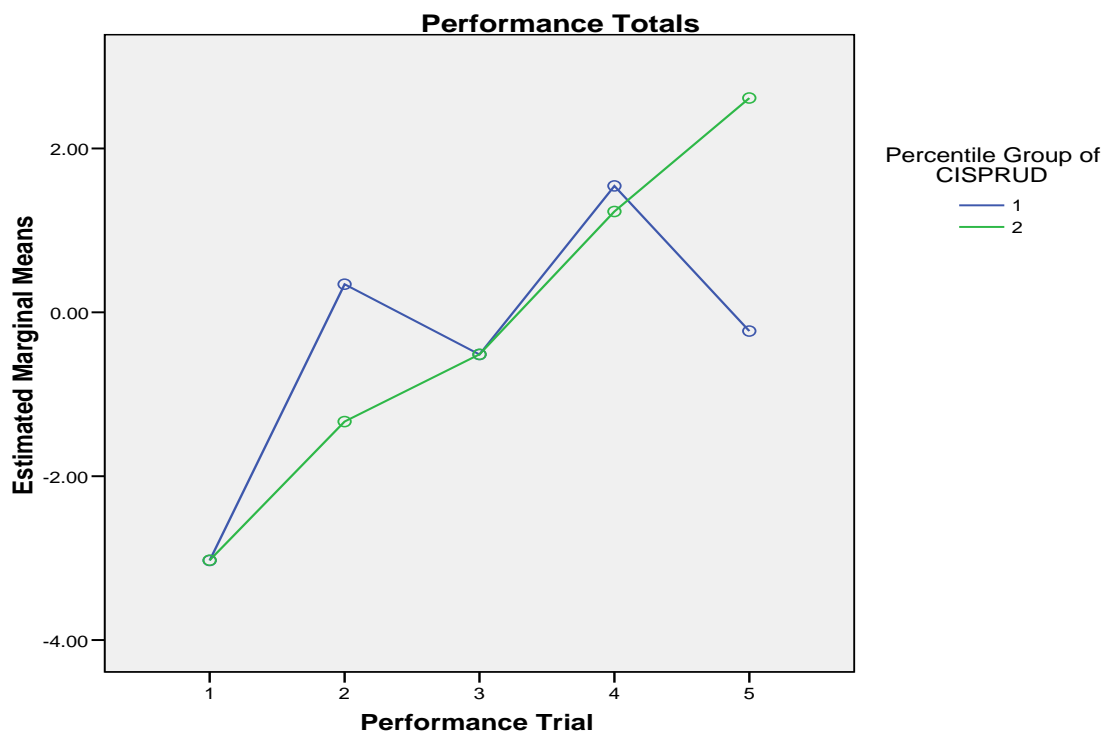


Figure B1. IGT Choices as a Function of Consumer Impulsivity and Trial Block, S2 (N = 74)

APPENDIX C - TASK

RP# _____

Separate condition Instructions

Accountability -

We are interested in the buying habits of college students. You will be presented with a list of items, often purchased by college students, and asked about the time frame in which you would buy these items. After deciding how soon you would likely buy the items, you will be asked to justify your purchases to the experimenter. We want to know the rationale underlying your purchase decisions.

Not accountable –

We are interested in the buying habits of college students. You will be presented with a list of items, often purchased by college students, and asked about the time frame in which you would buy these items.

In this section we are interested in learning about your typical shopping habits.

Imagine you are in the market for each of the items listed below.

Circle the number of days you would likely wait until purchasing the following items.

1. NIKON COOLPIX 8.0 DIGITAL CAMERA. PRICE: \$179.99

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 - No pleasure
- 2 - Some pleasure
- 3 - Very pleased
- 4 - Extremely pleased

2. FULL MATTRESS AND BOX SPRING SET. PRICE: \$350

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 – No pleasure
- 2 – Some pleasure
- 3 - Very pleased
- 4 - Extremely pleased

5. T-MOBILE SIDEKICK WITH ENHANCED WEB BROWSER, VIDEO RECORD AND PLAYBACK. PRICE: \$299.99

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
 28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 – No pleasure
- 2 – Some pleasure
- 3 - Very pleased

4 - Very likely

5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

1 – No pleasure

2 – Some pleasure

3 - Very pleased

4 - Extremely pleased

8. VACUUM WITH 12-AMP MOTOR AND HEPA FILTRATION SYSTEM:
ORIGINAL PRICE: \$200

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

1 - Not Likely

2 - Somewhat likely

3 - Likely

4 - Very likely

5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

1 – No pleasure

2 – Some pleasure

3 - Very pleased

4 - Extremely pleased

9. SONY PSP HANDHELD VIDEO GAME PLAYER: ORIGINAL PRICE: \$170.00

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 – No pleasure
- 2 – Some pleasure
- 3 - Very pleased
- 4 - Extremely pleased

10. 5-PIECE LUGGAGE SET: ORIGINAL PRICE: \$300

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

1 – No pleasure

2 – Some pleasure

3 - Very pleased

4 - Extremely pleased

11. 30” WIDESCREEN HDTV-READY FLAT SCREEN TV:

ORIGINAL PRICE: \$900

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27

28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

1 - Not Likely

2 - Somewhat likely

3 - Likely

4 - Very likely

5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

1 – No pleasure

2 – Some pleasure

3 - Very pleased

4 - Extremely pleased

12. 2.2 CUBIC FOOT MICROWAVE WITH 1300 WATTS: ORIGINAL PRICE: \$80

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27

28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

1 - Not Likely

- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 – No pleasure
- 2 – Some pleasure
- 3 - Very pleased
- 4 - Extremely pleased

13. TIVO HD DVR RECORDER WITH 12 MONTHS OF SERVICE: ORIGINAL PRICE: \$299.99

Days until purchase: 1-3 4-6 7-9 10-12 13-15 16-18 19-21 22-24 25-27
 28-30 31+

If you didn't have the money to purchase the item now, would you be willing to either take out a loan or put the item on credit in order to make the purchase soon?

- 1 - Not Likely
- 2 - Somewhat likely
- 3 - Likely
- 4 - Very likely
- 5 - Extremely likely

How much pleasure would you feel as a result of purchasing this item?

- 1 – No pleasure
- 2 – Some pleasure
- 3 - Very pleased
- 4 - Extremely pleased

Pleasure

Practical need

30. TIVO HD DVR RECORDER WITH 12 MONTHS OF SERVICE: ORIGINAL PRICE: \$299.99

Pleasure

Practical need

31. WINDOW AIR CONDITIONER UNIT: ORIGINAL PRICE: \$250

Pleasure

Practical need

32. On average, what percent of your purchases are made on items that are bought primarily to fulfill functional needs or your enjoyment? Out of 100% _____

Please explain your rationale for buying the item in the amount of time you specified. You may go back to look at the number days specified, but do not change any of your original answers.

Give as many reasons as you have and put each reason on a separate line.

NIKON COOLPIX 8.0 DIGITAL CAMERA. PRICE: \$179.99

Rationale -

FULL MATTRESS AND BOX SPRING SET. PRICE: \$350

Rationale -

I-POD NANO 8 GB. PRICE: \$199.99

Rationale -

27" ELECTRIC WASHER AND DRYER. PRICE: \$900

Rationale -

T-MOBILE SIDEKICK WITH ENHANCED WEB BROWSER, VIDEO RECORD AND
PLAYBACK. PRICE: \$299.99

Rationale -

STUDENT DESK AND CHAIR PACKAGE: ORIGINAL PRICE: \$275

Rationale -

STAINLESS STEEL AND SILVER WATCH: ORIGINAL PRICE: \$80

Rationale -

VACUUM WITH 12-AMP MOTOR AND HEPA FILTRATION SYSTEM: ORIGINAL PRICE: \$200

Rationale -

SONY PSP HANDHELD VIDEO GAME PLAYER: ORIGINAL PRICE: \$170.00

Rationale -

5-PIECE LUGGAGE SET: ORIGINAL PRICE: \$300

Rationale -

30" WIDESCREEN HDTV-READY FLAT SCREEN TV: ORIGINAL PRICE: \$900

Rationale -

29. 2.2 CUBIC FOOT MICROWAVE WITH 1300 WATTS: ORIGINAL PRICE: \$80

Rationale -

30. TIVO HD DVR RECORDER WITH 12 MONTHS OF SERVICE: ORIGINAL PRICE: \$299.99

Rationale -

WINDOW AIR CONDITIONER UNIT: ORIGINAL PRICE: \$250

Rationale -
