THE IOWA GAMBLING TASK: REAL VERSUS FACSIMILE REWARDS AND PSYCHOPATHY

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By

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Abstract

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The Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994) has been the foundation of much of the recent research on adaptive decision making in humans. This task was first described by Bechara et al. in their research on patients with ventromedial (VM) lesions. These investigators have found impairments in the decision making processes of those with VM lesions. The Iowa Gambling Task was developed in an attempt to quantify those adaptive decision making deficits and has since been used to study adaptive decision making in those with antisocial and aggressive personalities (Blair, 2004; Blair, Colledge, & Mitchell, 2001); substance abusers (Bolla et al., 2002); children and age differences (Garon & Moore, 2004; Kerr & Zelazo, 2004); as well as instrumental and reactive aggression (Berkowitz, 1993, Raine et al., 1998). However, much remains to be understood about this experimental decision making task, specifically, the type of reinforcement provided. Bowman and Turnbull (2003) recently demonstrated that groups receiving real contingencies did not differ from a group that received imagined contingencies. However, we know that antisocial and psychopathic

traits are related to both Iowa Gambling Task performance and the perception of positive and negative contingencies. This study examined the differences between real and facsimile reinforcers, while taking the personality of the individual into account. Similar results were found in comparison to Bowman and Turnbull's study in that participants learned the task over trials, however no significant difference was found between real versus facsimile reinforcers. Furthermore, scores on the Levenson Self-Report Psychopathy Scale and the M5 domains of Neuroticism, Extroversion, Agreeableness, and Conscientiousness did not result in significant improvement of selections between the facsimile condition and the cash condition.

Introduction

The Iowa Gambling Task is a commonly used instrument when assessing decision making in individuals. However, the spectrum of individual differences continues to expand and as a result, a true understanding of why individuals make the choices that they do remain in question. Individuals make decisions every day, some of which result in a positive outcome, while others result in extreme negative outcomes. Researchers continue to search for answers as to why individuals make choices that lead to such negative outcomes such as engaging in substance abuse, gambling, and many other self-destructive behaviors.

Why do people continue to engage in behaviors that provide immediate rewards yet make these choices that inevitably lead to a greater loss? Bechara et al. (1994) developed a task that attempts to answer this question. The Iowa Gambling Task has been used in many studies addressing decision making and its relationship with topics such as substance abuse, pathological gambling, brain damage, and psychopathy. One limitation of the use of the Iowa Gambling Task in such studies is its form of reinforcement. The Iowa Gambling Task is frequently used as a computer program in which participants are competing with themselves to receive a facsimile reward. However, participants may not be prompted to give their best effort on this task due to the fact that they are playing for facsimile money. A question that remains is whether participants' performance on the

Iowa Gambling Task would improve when given the opportunity to receive real money in place of facsimile money.

Bowman and Turnbull (2003) attempted to address this issue in a study that focused on real versus facsimile rewards on the Iowa Gambling Task. Although they did not find any significant differences in performance between conditions, they did not address personality types of the participants. Another difficulty with this study is the amount of real money they provided as a reward. Therefore, research in this area may want to include greater monetary rewards as well as include measures addressing individual personality traits. More specifically, personality traits associated to psychopathy have been found to result in selections of the disadvantageous decks on the Iowa Gambling Task as well as a slower learning of the task.

Individuals with psychopathic personality traits have been found to perform similarly to those with brain damage on the Iowa Gambling Task (Blair, 2004; Blair et al., 2001). As normal individuals tend to learn the task at a quicker rate and begin to select from advantageous decks, those with psychopathic traits continue to select disadvantageously and have a difficult time learning the task. Since the Iowa Gambling Task has been used to look at decision making in normal individuals as well as those with psychopathy, it is of interest to combine the two groups. This may help researchers determine if there is a difference in performance when these individuals are given the opportunity to complete the task for real money rather than facsimile money.

Literature Review

Iowa Gambling Task: An Overall Description

An essential feature of The Iowa Gambling Task is the simulation of real life situations, which are mimicked in the way the Iowa Gambling Task takes the following into account: uncertainty, reward, and punishment (Bechara et al., 1994). The goal of the gambling task is for the participant to maximize his or her profit on a loan of play money. Participants are asked to choose 100 cards from any of the four decks of cards, A, B, C, and D. Participants are not informed of how many selections they will be making and they are able to choose a card one at a time from any of the four decks of cards. Unbeknownst to the participant, decks A and B are disadvantageous decks whereas decks C and D are advantageous decks. Decks A and B are high-risk cards that provide the participant with larger amounts of money, yet they also include cards that cause the participant to lose larger amounts of money. The A and B decks consist of cards valued at 100 dollars each. However, these decks also include a card that results in the loss of 1,250 dollars. These cards are chosen after 10 selections from the A or B decks. Even though the participant only receives 50 dollars per card, when choosing from Decks C and D, these decks are advantageous because the subject only loses 250 dollars in every 10 cards. Overall, decks C and D are advantageous in the end with the result of a 250-dollar gain in every 10 cards chosen.

A sizeable amount of research has been conducted using the Iowa Gambling Task to explore findings in relation to decision making, brain injury, substance abuse, and antisocial personalities. Many scholars have found a connection between brain lesions and decision making using the Iowa Gambling Task as part of their research.

The development of decision making in early childhood. Researchers have found significant age differences in decision making tasks similar to the Iowa Gambling Task (Garon & Moore, 2004; Kerr & Zelazo, 2004). This has led many researchers to investigate the differences in age in relation to the development of the dorsolateral prefrontal cortex (DL-PFC) and the orbitofrontal cortex (OFC). Much of the research has addressed the OFC in relation to executive function, specifically decision making in regards to events related to emotion. Object reversal, a task that involves learning the process of a task and its reinforcement followed by the reversal of the task and reinforcement, has been found to be highly related to the OFC. Overman, Bachevalier, Schuhmann, and Ryan (1996) conducted research on object reversal, finding improvements on the task as age increased. In the same study it was found that males performed better than females when given the task prior to 30 months of age.

The Children's Gambling Task was created in order to examine age differences in decision making (Kerr & Zelazo, 2004). The Children's Gambling Task is a modified version of the Iowa Gambling Task in that the researchers reduced the four decks to two decks, provided candy as a reinforcement instead of play money, used happy and sad faces, used smaller quantities of gains and losses, and administered 50 trials instead of 100 trials. The researchers expected 3-year-olds to make disadvantageous choices more

than the 4-year-olds. It was determined that 3-year-olds performed more disadvantageously than the 4-year-olds and 4-year-olds were more likely to improve throughout the trials. Kerr and Zelazo failed to find any differences in relation to sex. Throughout this research as well as similar research, results indicate that decision making, such as what is studied in the Iowa Gambling Task, develops rapidly throughout the younger years of life, particularly the preschool period.

In a similar study conducted by Garon and Moore (2004), similar results were found in regards to age difference. Yet in this study, females were found to choose more advantageously than males. In this study, Garon and Moore modified the Iowa Gambling task, yet it was a much lesser modification than that of Kerr and Zelazo (2004). Garon and Moore used three age groups: 3-year-olds, 4-year-olds, and 6-year-olds. They used Smarties instead of play money yet they continued with four decks of cards with two being advantageous and two being disadvantageous. The number of trials was reduced to 40 cards instead of 100 cards. An awareness test was also conducted at the end of the game in order to examine the child's awareness of the task. Children in this study were not provided with instructions in regards to some of the decks being more beneficial than others. It was found that females chose more advantageously than males on all of the blocks. Garon and Moore found that 6-year-olds exhibited a greater awareness of the game and similarly there was a significant age effect in regards to performance on the task.

The Iowa Gambling Task and the brain. The frontal lobes of the brain have been found to have specific effects on decision making in humans, more specifically the

orbitofrontal cortex (Bechara, Damasio, & Damasio, 2000). Even more specific, the ventromedial sector, which includes the gyrus rectus, mesial half of the orbital gyri, and the inferior half of the medial prefrontal surface, has been thoroughly researched in regards to the outcome of damage to the sector. Patients with bilateral ventromedial prefrontal lesions have been the focus of research (Tranel, Becahara & Denburg, 2002). Most significantly, bilateral lesions in this area are frequently caused by rupture of aneurysms in the anterior cerebral or anterior communicating arteries. Surgeries on tumors in this region also have a chance to cause bilateral damage.

Many studies have found these damages to cause severe impairments in social conduct, decision making, and emotional processing (Tranel et al., 2002). It has been found that damage to the ventromedial sector not only affects decision making, conduct, and emotion, it has an overall effect on personality. An individual's personality has been found to change after damage to the ventromedial sector, becoming socially irresponsible and unable to make adaptive decisions. These individuals have great difficulty making appropriate decisions in regards to their own lives. Although individuals with this particular brain damage have difficulty with decisions, their intellectual abilities remain intact (Bechara et al., 2000).

A specific question remaining in many researcher's studies is whether or not there is asymmetry in regards to the above deficits relating to the right and left ventromedial prefrontal regions (Tranel et al., 2002). Emotional processing is highly supported by researchers to be the role of the right hemisphere, identifying lesions in this region to cause difficulty in processing emotional faces or scenes, emotional experience and

arousal, and imagery for emotion (Adolphs, Damasio, & Tranel, 1996). Ultimately, the above findings support asymmetry by finding the right hemisphere to have important roles in decision making.

A 2002 study conducted by Tranel et al. generated an era of researchers addressing the issue of asymmetry in regard to the right and left ventromedial prefrontal sectors. In the study, the researchers studied patients with focal unilateral ventromedial prefrontal cortex lesions. Procedures used in the study measured social behavior, decision making, and emotional processing. The researchers also used structured interviews, self-report measures, and reports from collaterals in order to assess patients' functioning in every day living.

One important characteristic of individuals with brain damage to the ventromedial sector is their inability to process emotion and feeling; they do not have the capacity to apply emotion to complex situations and events (Damasio, Tranel, & Damasio, 1991). These deficits led to the development of the Somatic Marker Hypothesis which identifies a defect in emotion and feeling in individuals with brain damage which has a great impact upon their decision making (Damasio, 1994). Individuals with damage to the ventromedial cortex have impaired decision making which may result from their inability to experience emotions and feelings in regards to complex events or situations.

Somatic Marker Hypothesis and skin conductance responses. The Somatic Marker Hypothesis, developed by Antonio Damasio (1994), is a theory which indicates that adaptive decision making is largely affected by one's emotional state which marks cognitions, in turn guiding behavior. Damasio proposes that an individual has difficulty

making decisions when response options are not marked by emotional states. Somatic markers are created through socialization and education, in which an individual learns the connection between stimuli and affective states. Once the individual has learned this process, the somatic marker guides behavior by being aware of the outcome of the behavior.

Damasio has based his theory on studies of individuals with ventromedial frontal lesions (1994). He has proposed that these individuals fail to make advantageous decisions because they are unable to choose from multiple response options. He further suggests that these individuals lack this ability due to a defect in using somatic markers. These individuals tend to have difficulty with social behavior, indecisiveness, irresponsibility, and failure to plan ahead. This theory has been thoroughly studied through the use of the Iowa Gambling Task with patients who have ventromedial frontal lesions.

Tomb, Hauser, Deldin, and Caramazza (2002) criticized Damasio's Somatic Marker Hypothesis. They cite two hypotheses which include the anticipatory skin conductance responses (SCR) from Damasio's Somatic Marker Hypothesis. First, Tomb et al. indicated that anticipatory SCRs may be involved in correct versus incorrect decision making. The larger SCR, which is indicated prior to choosing the bad decks, may bias the participant's further choosing of bad decks. The second hypothesis indicates that participants are more likely to have higher SCRs for bad decks due to these SCRs being higher in magnitude. Tomb et al. tested the above hypotheses, citing the first hypothesis to attribute learning and decision making to SCRs. This hypothesis was tested

using the original gambling task. Their second experiment involved changing the scheme in order for the good decks to be correlated to a higher magnitude of punishment and reward than bad decks. Tomb et al. indicated that SCRs should be higher for bad decks if somatic markers drive long-term evaluation of the decks. Their results supported this second hypothesis; therefore they suggest that card selection is based on long-term consequences rather than SCRs. They concluded that SCRs do not provide evidence for the role of somatic markers in decision making.

In response to the above criticism, Damasio, Bechara, and Damasio (2002), indicate that the second task was changed from the standard version of the gambling task, resulting in substantial differences. Damasio et al. (2002) reported that somatic markers can be either positive or negative. It is also reported that high-magnitude anticipatory SCRs before good decks may be related to a nonconscious danger signal. Hanna Damasio et al. (2002) hold that somatic markers assist decision making, yet they are not always engaged in every decision.

Maia and McClelland (2005) also questioned the Somatic Marker Hypothesis in response to a study conducted by Maia and McClelland in 2004. In this study, Maia and McClelland report participants as being able to more reliably identify their knowledge of a strategy than they are able to behave advantageously. Their conclusion from their study suggests that somatic markers are not the only explanation, rather there is a difference between exploration and exploitation. Participants must incorporate some variability in their behavior in order to gain information prior to choosing from the four decks. Although Maia and McClelland (2005) do not fully disagree with the Somatic Marker

Hypothesis, they indicate an easier solution. They conclude that somatic markers are not required in order to explain the results of individuals' performance on the gambling task.

In response to the above conclusion, Bechara, Damasio, Tranel, and Damasio (2005), attempt to answer the conclusions of Maia and McClelland (2005). Bechara et al. (2005) believe that the results of Maia and McClelland's (2004) study do not undermine the Somatic Marker Hypothesis. Maia and McClelland's (2004) report focused on participants' conscious knowledge during the gambling task while the Somatic Marker Hypothesis is related to emotional signals which may be independent from a participants consciousness. It is important to understand that the gambling task is not the basis for the Somatic Marker Hypothesis (Bechara et al., 2005).

Psychopathic and Antisocial Personality

Maladaptive decision making has been found in those with psychopathic behaviors, specifically in those with Antisocial Personality Disorder (Blair, 2004; Blair et al., 2001). In order to understand the process of these individuals in making decisions it is important to distinguish between instrumental and reactive aggression that is exhibited by those with antisocial personality traits. Reactive aggression is an aggressive act in which anger is usually present, caused by an event deemed frustrating or threatening (Blair). A vital aspect of reactive aggression is its potential to begin without any focus on a goal. On the other hand, instrumental aggression is a type of aggression used to obtain a goal that is important to the individual (Berkowitz, 1993). Reactive aggression is more deeply researched due its relationship to the amygdala and orbital frontal cortex (Blair). Bechara and colleagues have conducted a substantial amount of research on the presence of

reactive aggression and its relationship with the amygdala and the orbital frontal cortex. In a study conducted by Anderson, Bechara, Damasio, Tranel, and Damasio (1999), individuals with damage to these regions were found to have increased risk for reactive aggression. A similar observation of individuals with impaired functioning in the frontal cortex does not pertain to patients who exhibit instrumental aggression (Raine et al., 1998). Rolls (2000), as well as Blair and Cipolotti (2000), have identified two processes relating the frontal cortex with reactive aggression. The first process is the individual's ability to understand the expectations of reward. The second process addresses the individual's awareness of violating expectations and their inability to regulate behaviors in response to other social cues, also known as Social Response Reversal.

Individuals with impairment to the temporal, striatal, and premotor cortices exhibit higher levels of instrumental aggression which is most likely an outcome of previous reinforcement for their behaviors (Blair, 2004). Amygdala dysfunction has been found to have an impact on instrumental aggression, aggression that is evident in psychopathic individuals, especially those with instrumental antisocial behaviors (Cornell et al., 1996).

The orbital frontal cortex has been found to be involved in response reversal, in which impairments can be found in psychopathic individuals (Blair, 2004). Researchers have found similarities in psychopathic individuals as well as those with orbitofrontal cortex lesions (Damasio, 1994). Both psychopathic individuals and patients with orbitofrontal cortex lesions show difficulty in modulating their aggression, yet individuals with brain lesions exhibit more of a tendency to display reactive aggression

(Anderson et al., 1999) as opposed to those with psychopathic tendencies exhibiting more instrumental aggression (Cornell et al., 1996). Researchers have identified three cognitive systems that have been related to the orbitofrontal cortex. Blair and Cipolotti (2000) have identified the social response reversal system in which individuals are unable to react appropriately to another's angry expressions. They also associate current angry states with those experienced from other individuals in previous occurrences. These impairments have not been found in psychopathic individuals despite the tendency of psychopathic individuals to have difficulty processing expressions. These individuals show impairment in distinguishing the expressions, yet they are able to recognize inappropriate behaviors in regards to other people's anger. Secondly, Antonio Damasio's Somatic Marker Hypothesis has related emotional states to decision making (Damasio). Antonio Damasio has found that damage to the somatic marker system causes the inability of the somatic marker to guide one's behavior. Individuals with impaired somatic marker systems are unable to shift their behavior to the "good" decks of cards (Bechara et al., 2000). Lastly, Rolls' response reversal system studies suggest the orbitofrontal cortex's involvement in altering stimulus-reward associations (Rolls, 2000). Rolls suggests that individuals with orbitofrontal cortex lesions have more difficulty shifting tasks when the stimulus-reward system changes.

Blair et al. (2001) conducted a study to take into consideration the above hypotheses. They recruited boys from schools for emotional and behavioral difficulties and screened them with the Psychopathy Screening Device. They were also administered the British Picture Vocabulary Scale in order to estimate their intelligence. The boys were

administered the Iowa Gambling Task as well as the Intradimensional/Extradimensional Shift Task (ID/ED). They found that individuals with psychopathic tendencies were more likely than their comparison group to choose from disadvantageous decks and failed to learn to avoid the disadvantageous decks as the task progressed.

They also conducted a similar study with older individuals who were recruited from three high security forensic institutions (Mitchell, Colledge, Leonard, & Blair, 2002). The mean age was 33.06 years ranging from 21 to 50 years of age. The study began with 51 inmates, yet only 31 completed all of the tasks for the study. The participants were administered the Raven's Advanced Progressive Matrices, the Hare Psychopathy Checklist Revised (PCL-R), the Iowa Gambling Task, and the ID/ED Shift Task. The study found that psychopathic individuals were more likely to choose disadvantageously than the control group, and they were also more likely to continue to select disadvantageously throughout the task. The psychopathic individuals failed to become increasingly risk-aversive as the task progressed as opposed to the control group.

In a 2001 study conducted by Slutske and colleagues, members of the Vietnam Era Twin Registry were interviewed with a version of the Diagnostic Interview Schedule (DIS). The symptoms were only assessed if the individual had ever gambled more than 25 times in a year. The study included not only pathological gambling but also examined the association of antisocial behavior disorders with pathological gambling. Conduct disorder (CD), adult antisocial disorder (AAD), and antisocial personality disorder (ASPD) were included in the diagnosis. It was found that CD, AAD, and ASPD were significantly associated with all types of pathological gambling.

Psychopathy, Decision Making, and Gambling

A similar study was conducted to examine the association between personality disorders and pathological gamblers (Blaszcynski & Steel, 1998). The participants consisted of 82 pathological gamblers seeking treatment at the Impulse Disorders Research Unit. All subjects met the DSM-III-R diagnostic criteria for pathological gambling. They were given the Personality Disorder Questionnaire-Revised (PDQ-R modified), the South Oaks Gambling Screen (SOGS), the Eysenck Impulsivity Scale, the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI). Seventy-six of the 82 subjects met diagnostic criteria for one of the personality disorders. A higher proportion of the pathological gamblers were found to have personality disorders overlapping the following categories: antisocial, borderline, histrionic, and narcissistic. It was also found that personality disorders were associated with higher scores on the severity of their problem gambling behaviors.

Black and Moyer (1998) found similar results in a study of 23 men and 7 women with high scores on the SOGS. The participants also completed the DIS and PDQ-IV in which findings were related to the presence of a personality disorder. A high rate of antisocial personality disorder was found in pathological gamblers included in the study.

Substance Abuse

A substantial amount of research has been conducted in order to assess the effects of substance abuse on decision making, and more specifically the orbitofrontal cortex. It has been found that cocaine abuse is related to poor decision making due to its damage to the neural networks in the orbitofrontal cortex (Bolla et al., 2002). Antoine Bechara has

found that substance dependent individuals show similar behaviors to individuals with damage to the VM (Bechara, 2003). He notes two similarities between substance dependent individuals and VM patients:

> They often deny, or they are not aware, that they have a problem. When faced with a choice to pursue a course of action that brings an immediate reward at the risk of incurring future negative consequences, they choose the immediate reward and ignore the future consequences. (p. 23)

In the case of Phineas Gage, neuroimaging provided information about his ventromedial region in a bilateral fashion (Damasio, Grabowski, Frank, Galburda, & Damasio, 1994). This outlook as well as Phineas Gage's functioning after the brain damage has aided researchers in studying decision making and brain behavior. His case prompted researchers to begin studying the relationship between VM damage and poor social conduct, judgment, decision making, and personality (Bechara, 2003). In studying many other patients with similar lesions to that of Phineas Gage, Bechara and his colleagues have found similar results. The patients have exhibited normal intelligence and creativity before the brain damage, but have difficulties with planning, social situations, and activities after the damage. Despite the patient's difficulties with executive tasks, their intelligence remained normal.

In a study conducted by Bechara and Damasio (2002), participants were classified as substance dependent individuals, normal controls, and VM patients. The results of the study indicated findings in regards to impairment in the performance of substance dependent individuals as compared to normal controls. There were findings in substance

dependent individuals performing within the range of VM patients. This is believed to be related to the impairment of the emotional signaling that regulates decision making as stated in the Somatic Marker Hypothesis. A group of substance dependent individuals was found to have impaired anticipatory skin conductance responses which support the poor decision making in these patients being associated with defective regulation of emotions. These difficulties in anticipatory skin conductance responses are associated with the defective activation in the dysfunctional VM cortex.

In a study conducted by Bolla et al. (2002), participants were divided into a control group and a cocaine group. The participants were administered the Iowa Gambling Task, Positron Emission Topography scans, and a version of the Iowa Gambling Task that was modified to have equal gains and losses between decks. The findings confirmed the effects of cocaine abuse on the OFC as well as the dorsolateral prefrontal cortex. It was found that patients that abused cocaine had more activation in the right OFC and less activation in the dorsolateral prefrontal cortex. On the Iowa Gambling Task, the cocaine group performed more poorly than the control group, yet the findings were not statistically significant. The study also provided a correlation between the grams of cocaine used and less activation in the left OFC. A strong correlation was found between a participant's superior performance and higher activation in the right medial OFC. This was found in both the control group and the cocaine group. This finding suggests that the OFC is involved in decision making despite the group assignment. It is suggested that cocaine abusers compensate for the lack of activity in the right OFC by overactivating the left OFC. This finding is related to the immediate reward

found by cocaine abusers when using cocaine, as they appear unable to process the consequences of cocaine use. This supports the findings by Bechara et al. (2000), that OFC dysfunction impairs individual's ability to relate past experiences with present emotions (Bolla et al.).

Time Constraints and the Iowa Gambling Task

Bowman, Evans, and Turnbull (2005) conducted a study in order to determine whether the time constraints of the different types of administrations of the Iowa Gambling Task had an effect on an individual's level of frustration and subsequent choices on the task. The researchers investigated three different types of time constraints on the Iowa Gambling Task: the manual administration without time constraints, the computerized administration with a 6-second delay between choices, and a control computerized administration without time constraints. The researchers did not find a significant difference in performance between the three groups. Bowman et al. also provided a subjective experience measure in which they found consistent effects in all three types of administration. This subjective measure was administered after every block of card selections. The participants were asked to rate the decks as good or bad decks with zero being very bad and 10 being very good. Participants responses on the subjective measure indicated a growing awareness of which decks were good and which decks were bad.

Real Versus Facsimile Reinforcers

In a study conducted by Bowman and Turnbull (2003), real versus facsimile reinforcers were examined in order to determine whether the difference in reinforcers

would have an effect upon the decision making of the participants on the Iowa Gambling Task. The study did not provide any significant findings in relation to the real and facsimile reinforcers. Individuals playing for play money made more choices from the disadvantageous decks than those playing for real money, yet they did not make enough choices from the disadvantageous decks to result in an overall significant difference. Bowman and Turnbull found a greater standard deviation in the facsimile condition over the real money condition. They felt that this may be important in further use of the Iowa Gambling Task as a clinical tool due to the fact that the spectrum of scores on the facsimile money was much larger than that of the real money. They felt that the use of facsimile money might not be as accurate as the use of real money, since there were so many more individual differences between the performance of those who were playing for facsimile money.

Fernie and Tunney (2006) conducted a study in response to Bowman and Turnbull's (2003) study with the Iowa Gambling Task and real versus facsimile reinforcers. In this study, Fernie and Tunney not only looked at real versus facsimile reinforcers, they provided a differing set of directions to the groups. They also conducted a second administration of the task with each participant. Each administration included a hint condition and a no hint condition in which the participants were given the basic Iowa Gambling Task instructions or were provided the hint that some decks are worse than others. Another factor included was a real money condition. This was provided in each administration with a hint group and a no hint group. The results of this study indicate that the net score increased with exposure to the task. It was also found that the mean net

score across blocks was higher when participants were earning real money in the first session. Since there was not an interaction between reinforcer type by instruction type, Fernie and Tunney found that hint instructions did not differentially affect performance between real money and facsimile money. In the participants that received the no hint instructions, there was found to be an effect of reinforcer type. Net score was higher with the no hint instructions when the participants were able to win real money. As a result, Fernie and Tunney found that reinforcer type does not have an effect on performance unless the task instructions do not give a hint to bad decks. When the hint instructions are given, the effect of real money reinforcers is cancelled out. Fernie and Tunney also found that participants learned at a higher rate following hint instructions rather than no hint instructions.

Bowman and Turnbull's 2003 study differed somewhat from that of Fernie and Tunney's 2006 study. One difference between Bowman and Turnbull's study and Fernie and Tunney's study is that Bowman and Turnbull used the hint instructions for the task as well as the manual version of the Iowa Gambling Task. On the other hand, Fernie and Tunney used the computerized version of the Iowa Gambling Task as well as differing instructions.

A study conducted by Bos, Houx, and Spruijt (2006), addressed differences in performance when the ratio of reinforcement magnitude was changed on the Iowa Gambling Task. In the original Iowa Gambling Task, the ratio between the decks is 2:1. In this study, the researchers manipulated these differences while keeping the net gains and losses per 10 cards the same. When the reward magnitude was decreased to 1:1, the

participants selected more cards from disadvantageous decks and lost more money than when the ratio was 4:1 and 6:1. The researchers in this study determined that participants may perform differently when the amount of the reward is altered. Overall, participants were more willing to select from the advantageous decks when the reward magnitude was smaller and more likely to choose the disadvantageous decks when reward magnitude was greater.

Statement of the Problem

We know that antisocial and psychopathic traits are important constructs in understanding how people respond to positive and negative contingencies. We know that these constructs are also related to performance on the Iowa Gambling task. Bowman and Turnbull (2003) did not control for these personality constructs in their assessment of the ecological validity of the IGT. As a result, we predict that antisocial and psychopathic traits will be a significant covariate in the analysis of the effect of real vs. imagined contingencies on IGT performance. Moreover, we predict that those normal personality constructs that are highly related to antisocial and psychopathic traits will also act as a moderator of the effect of real vs. imagined contingencies on IGT performance. Those normal personality constructs unrelated to antisocial and psychopathic traits will not act as a mediator of the effect of real vs. imagined contingencies on IGT performance.

Hypotheses

Hypothesis #1. Based on the abundance of literature published on the IGT, we predict that all participants will begin to select from the advantageous decks on the IGT.

The IGT net score will indicate this by showing increased selections from advantageous decks in the later trials.

Hypothesis #2. In response to Bowman and Turnbull's 2003 study, we do not expect to see a difference in improved selections between the cash condition and the facsimile condition.

Hypothesis #3. When the LSRP total psychopathy score is entered as a covariate, we do anticipate improvement of selections from the cash condition relative to the facsimile condition.

Hypothesis #4. As research has shown, the M5:100 domains of Neuroticism, Extroversion, Agreeableness, and Conscientiousness appear to be related to psychopathy. Therefore, when these domains are entered as covariates in a separate analysis, we do anticipate improvement of selections form the cash condition relative to the facsimile condition.

Hypothesis #5. Scores on the M5 domain of Openness to Experience have not shown a relationship with total psychopathy on the LSRP. Therefore, when Openness to Experience is entered as a covariate in separate analyses, we do not anticipate improvement of the cash condition relative to the facsimile condition.

Method

Participants

Fifty-two undergraduate students enrolled in undergraduate psychology classes participated in this study. Students enrolled in introductory psychology received 1 credit for each hour of participation in the study. Students in other courses received extra credit as determined by their instructor. The ages of the participants ranged from 19 to 43 years old ($M = 21.77$, $SD = 5.36$). There were 21 males and 31 females. All participants completed three tasks: the Iowa Gambling Task, the M5:100, and the LSRP, in a counter balanced sequence. Twenty-seven participants completed the above tasks by working for facsimile rewards. Twenty-five participants completed the above tasks by working for real money.

Measures

Iowa Gambling Task (IGT). The participants in each group were administered the Iowa Gambling Task (Bechara et al., 1994). This will serve as our primary dependent variable. This task is described in detail in the literature review above.

Levenson Self-Report Psychopathy Scale (LSRP). The LSRP (Levenson, Kiehl, & Fitzpatrick, 1995) is a 26 item self-report measure designed to assess the core personality features of psychopathy as well as a social deviance component. Individuals rate themselves on a 4-point likert scale where 1 = Strongly Disagree and 4 = Strongly Agree. The LSRP contains two factors. Factor 1, called Primary Psychopathy, is a measure of

the core personality traits of psychopathy which include an uncaring nature, manipulativeness, and selfishness. Factor 2, called Secondary Psychopathy is concerned with impulsivity and poor behavioral controls. Reliability ranges from .59 to .87 whereas the alpha coefficient for primary psychopathy is .82 and for secondary psychopathy is .63. The Total Psychopathy score which is a combination of primary psychopathy and secondary psychopathy was used as a covariate. In the development of the LSRP, Levenson et al. eliminated four items due to low factor loadings. The LSRP also includes prosocial behaviors that are reverse coded in order to help control response sets.

M5 Questionnaire (M5). The M5 Questionnaire (McCord, 2002) is a 100 item self-report measure designed to assess traits of normal personality. Items are scored on a 5-point likert scale where 1 = Inaccurate and 5 = Accurate. The M5 is based on the Five Factor Model of personality and provides domain scoring. The five-factor model is a model of personality, which includes five dimensions of personality traits (McCrae & John, 1992). These five dimensions are organized in a hierarchical fashion. The five dimensions are Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Research has shown that all five factors have convergent and discriminant validity that spans personality inventories based on the five-factor model. The M5 identifies the five domains: Neuroticism (N), Extroversion (E), Openness to Experience (O), Conscientiousness (C), and Agreeableness (A). Kelly, Mims, & McCord (2003), Kitt, Wegener, & McCord (2003), and Rosnov, Pickup, & McCord, (2003) have conducted preliminary studies of the M5 Neuroticism, Extroversion, and Openness to Experience domains which yield adequate validity.

Procedures

Students were recruited from four separate undergraduate classes. Classes were selected based on their instructor's willingness to participate. Each group of students was randomly assigned to one of two conditions. In one condition, participants completed the IGT following the standard directions (Bechara et al., 1994). The other group completed the IGT with the knowledge that they were competing for a 50 dollar award. At the end of the task, the participant with the highest IGT score received the 50 dollar award. Informed consent was obtained prior to completion of any experimental procedures. The participants in each group then completed the LSRP, and M5:100 (in a counter balanced sequence) followed by the IGT. Participants in the real money condition were not made aware of the 50 dollar award until the beginning of the IGT.

Design and Analysis

This was a two-way mixed design with real vs. imagined contingency as our between participants independent variable (IV) and IGT performance over five consecutive 20 trial blocks as the within participant IV. IGT score served as the dependent variable while LSRP and M5 Domain scores served as covariates. Repeated measure Analysis of Variance (ANOVAs) were run for hypotheses 1 and 2. Separate one-way Analyses of Covariance (ANCOVAs) were run for each of the covariates in hypotheses 3 through 5. The Greenhouse-Geisser correction was used in all analyses where Mauchly's Test of Sphericity revealed a failure to meet statistical assumptions.

Performance on the Iowa Gambling Task was divided into five 20-trial blocks from the 100 card selections. The five blocks were divided as follows: block one included

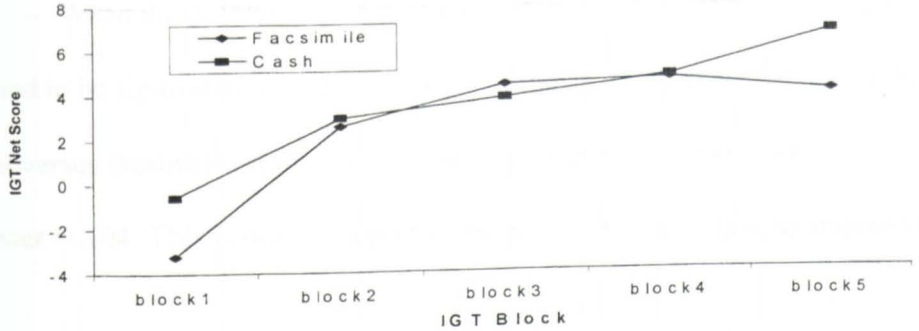
selections 1 through 20, block two included selections 21 through 40, block three included selections 41 through 60, block four included selections 61 through 80 and block five included selections 81 through 100. The net score for each block is calculated as the number of good selections minus the number of bad selections across decks ((C + D) – (A + B)). A net score of below zero indicates that the participants selected disadvantageously and a net score above zero indicates that the participants selected advantageously.

In analyzing the results, two participants failed to answer one M5:100 item per participant. These items were located in the Neuroticism domain and the Openness to Experience domain. Rather than removing the entire participant from the results and analysis, each participant was given a rating of 3, being the most neutral rating, in order to compute a domain score.

Results

In terms of the first and second hypotheses predicting improvement of selections across trials for all participants and no differential improvement between conditions, the following results were found. Overall, participants in all groups began selecting disadvantageously. However, as the task progressed participants in all groups began to select more advantageously across trials (see Figure 1). This improvement in performance across blocks was statistically significant, $F(2.72, 136.02) = 10.10$, $p \leq .009$, $\eta^2 = .17$, power = .997. After a spike in advantageous selections, the participants in the facsimile reward group began to select more disadvantageously in the last two blocks, whereas the real money group continued to select advantageously. However, these group differences were not significant. That is, there was no Trial by Group interaction, $F(2.72,136.02) = .70$, $p = .541$, $\eta^2 = .01$, power = .187. These findings are consistent with our first two hypotheses.

Figure 1. Mean Selection by Block Between Cash and Facsimile Conditions



Thirdly, it was hypothesized that when LSRP total psychopathy was held as a covariate, improvement would be evident in selection from the cash condition relative to the facsimile condition. When LSRP total psychopathy was held as a covariate it was not found to be significant $F(1,49) = 2.87$, $p = .096$, $\eta^2 = .06$, power = .383. Moreover, effect of real versus facsimile reinforcers was not significant $F(1,49) = .36$, $p = .550$, $\eta^2 = .01$, power = .091. This is not in support of the hypothesis anticipating improvement of the cash condition over the facsimile condition when the total psychopathy score on the LSRP was entered as a covariate.

Fourth, it was hypothesized that the M5:100 domain of Neuroticism would result in improvement of selections in the cash condition relative to the facsimile condition. This hypothesis was also made for the M5:100 domains of Extraversion, Agreeableness, and Conscientiousness. When the M5:100 domain of Neuroticism was entered as a covariate it was found not to be significant $F(1,49) = 2.59$, $p = .114$, $\eta^2 = .05$, power = .351. Furthermore, effect of real versus facsimile reinforcers was not significant $F(1,49) = .14$, $p = .710$, $\eta^2 = .01$, power = .066. This is not in support of the hypothesis anticipating improvement of the cash condition over the facsimile condition when the M5:100 domain of Neuroticism was entered as a covariate.

When the M5:100 domain of Extraversion was held as a covariate, it was not found to be significant $F(1,49) = .06$, $p = .803$, $\eta^2 = .01$, power = .057. Likewise, effect of real versus facsimile reinforcers was not significant, $F(1,49) = .48$, $p = .493$, $\eta^2 = .01$, power = .104. This is not in support of the hypothesis anticipating improvement of the

cash condition over the facsimile condition when the M5:100 domain of Extraversion was entered as a covariate.

When the M5:100 domain of Agreeableness was held as a covariate, it was not found to be significant $F(1,49) = .49$, $p = .489$, $\eta^2 = .01$, power = .105. Moreover, effect of real versus facsimile reinforcers was not significant, $F(1,49) = .50$, $p = .482$, $\eta^2 = .01$, power = .107. This is not in support of the hypothesis anticipating improvement of the cash condition over the facsimile condition when the M5:100 domain of Agreeableness was entered as a covariate.

When Conscientiousness was entered as a covariate it was not found to be significant $F(1,49) = .40$, $p = .530$, $\eta^2 = .01$, power = .095. Likewise, effect of real versus facsimile reinforcers was not significant, $F(1,49) = .49$, $p = .488$, $\eta^2 = .01$, power = .105. This is not in support of the hypothesis anticipating improvement of the cash condition over the facsimile condition when the M5:100 domain of Conscientiousness was entered as a covariate.

Lastly, Openness to Experience was not hypothesized to have an impact on improvement of selections between the cash condition and facsimile condition. When Openness to Experience was held as a covariate, it was not found to be significant $F(1,49) = 3.01$, $p = .088$, $\eta^2 = .06$, power = .401. Furthermore, effect of real versus facsimile reinforcers was not significant, $F(1,49) = .35$, $p = ..555$, $\eta^2 = .01$, power = .090. These findings are in support of the anticipation that the Openness to Experience domain would not result in an interaction between trial and condition.

Discussion

The present study was based on a large amount of research in the area of decision making. This study focused on the personality of the participants and their specific decisions made on the Iowa Gambling Task. The participants were undergraduate students who participated voluntarily in this study. The study examined personality traits by having the participants complete two personality inventories, the Levenson Self-Report Psychopathy Scale and the M5:100 questionnaire. The purpose of the study was to determine if the participants that reported personality traits related to psychopathy would make better decisions on the IGT when given the opportunity to win real money as opposed to facsimile money. Although many studies have been conducted in order to determine why individuals perform in certain ways on the IGT, fewer studies have been conducted to determine if participants are willing to provide their best effort on this task since they are only able to win facsimile money. Bowman and Turnbull (2003) conducted one such study; however, they did not take the individual's personality into consideration when determining if participants would make better decisions for real money as opposed to facsimile money. The present study took these factors into consideration and hypothesized that individuals with personality traits related to psychopathy would perform better when offered real money on the IGT rather than facsimile money.

As a result of this study, it was found that participants' selections improved over trials. This was found to be statistically significant, indicating a learning curve throughout

the task. These findings are consistent with the majority of the research conducted on participants' ability to learn across blocks on the IGT. When the task is divided into 5 consecutive blocks of 20 trials, participants in previous studies as well as the present study exhibit an increase in selections from the advantageous decks. However, this study did not find a significant difference in improvement of selections between the cash condition and the facsimile condition. This is also consistent with Bowman and Turnbull's 2003 study. Even when offered a chance to win 50 dollars, the participants in these cash condition groups continued a similar learning curve to those in the facsimile condition and did not show increased selections of advantageous decks.

Participants in the present study were asked to complete the LSRP in order to identify characteristics related to psychopathy. It was hypothesized that the participants scoring high in such characteristics would perform better in the cash condition group. This study did not find significant improvement of these individuals when compared to those in the facsimile condition. Again, the participants that indicated characteristics related to psychopathy performed on a similar curve to other participants in similar or different conditions. These findings are also similar to the findings on the M5:100. Participants that reported characteristics related to Neuroticism, Extraversion, Agreeableness, and Conscientiousness performed at similar levels to those in the facsimile condition. Overall, the hypotheses related to pscyhopathy and performance on the IGT did not result in significant differences in selections between the cash condition and the facsimile condition.

Openness to Experience is a domain of the M5:100 that has not been found to be related to psychopathy. As hypothesized, participants that rated characteristics related to Openness to Experience did not exhibit differences in performance on the IGT in the cash condition or facsimile condition. Because research has not found a strong relationship between Openness to Experience and psychopathy, it was not felt that this domain would be related to differences in performance.

Many limitations are evident in this study and may have had an impact on the results of the present study. First, in looking at the participants and their reasons for participation, the present study may have been hindered by the level of interest and willingness to provide the most accurate assessment by the participants. All of the participants were undergraduate students who participated in order to obtain class credit or to obtain extra credit. When conducting research with undergraduate participants, a main concern is their level of interest in the research. The participants were asked to complete one hundred and twenty six personality questions before completing the one hundred selections on the Iowa Gambling Task. The participants may not have completed the IGT, LSRP, and M5:100 to the best of their ability. Their performance on each of the measures may have been rushed and inaccurate.

Second, aside from not completing the measures with a high level of interest, one difficulty with personality inventories is an individual's interest in giving an accurate portrayal of their personality. This is usually related to individuals not wanting to present themselves in a negative light. Although, the M5:100 and LSRP provide reverse scored items in order to account for some of these difficulties, many participants may still have

attempted to rate the negative behaviors or characteristics in a more socially desirable manner. This would have an impact on the overall scores on LSRP total psychopathy and the M5:100 domain of Neuroticism.

Third, Bowman and Turnbull's (2003) study was conducted in a very similar way to the present study. The difference in the studies is that the present study used psychopathic and related personality traits as covariates in looking at performance in the cash condition versus the facsimile condition, whereas the previous study did not do so. Bowman and Turnbull's study did not result in significant improvement of the cash condition over the facsimile condition, yet the cash provided in the study was minimal. For the same reasons, the present study was limited in that the researchers were only able to provide 50 dollars in cash to two participants in the cash condition group. Although 50 dollars is more than was provided to the participants in the Bowman and Turnbull study, all participants in the cash condition were aware that there was only one chance per group to win 50 dollars. All of the other participants were unable to win any money if they did not receive the highest net score on the IGT. As in the Bowman and Turnbull study, this is a limited amount of cash that was provided to the participants.

Lastly, in relation to levels of reinforcement, Bos et al. (2006) conducted a study to assess the impact of different monetary amounts on the selections on the IGT. In this study it was found that participants were more likely to select advantageously when the disadvantageous decks included different amounts of money than the original IGT. Participants were found to select differently when the reward magnitude was increased or decreased. Therefore, differences in money amounts may be a factor in participants' level

of interest in the present study. It is felt that the undergraduate students would have been more likely to take the task seriously if they were able to win money on an individual basis and at a higher amount. However, due to the scope and level of this study, it was not possible to offer a larger amount of money, nor was it possible to offer cash to each participant in the cash condition.

Many studies have been conducted on the topics of decision making, psychopathy, rewards, and punishment. The results of these studies have aided in the understanding of decision making in normal individuals as well as individuals with psychopathic personality traits. Although we have support that decision making is impaired in individuals with damage to the ventromedial prefrontal cortex as well as individuals with psychopathic personality traits, we were unable to determine if such individuals would perform more advantageously when offered a cash reward (Bechara et al., 1994; Blair, 2004; Blair et al., 2001). The results of the present study are consistent with that found by Bowman and Turnbull (2003) even after using LSRP total psychopathy score and M5:100 Neuroticism, Extraversion, Agreeableness, and Conscientiousness as covariates in the analyses. Despite the limitations and outcome of this study, there is still promising research in this area. In further studies on types of reinforcement, it will be important to include a larger amount of cash as a reward as well as rewarding each individual in the cash condition. Bowman and Turnbull also noted a similar progression of decisions as can be seen in Figure 1 of the present study. During the last blocks of the Iowa Gambling Task, it appears that those in the facsimile condition began to select more disadvantageously as those in the cash condition continued to select

more advantageously. In future studies, it may be interesting to lengthen the amount of selections beyond one hundred in order to follow the trend that began to occur in the last blocks of the Iowa Gambling Task.

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Appendices

APPENDIX A

Informed Consent Form
Iowa Gambling Task

What is the purpose of this research?
The purpose of this research is to investigate performance on a gambling task in relations to one's personality.

What will be expected of me?
You will be asked to complete the Iowa Gambling Task on the computer as well as three questionnaires.

Will my answers be confidential?
Yes. You can withdraw from the research procedure at any time and ask that your answers not be used.

Is there any harm that I might experience from taking part in this study?
There is no risk of any type involved in participation in this study.

How will I benefit from taking part in this research?
You will obtain research participation credit in you Psy 150 course in exchange for participating in this study.

Who should I contact if I have questions or concerns about the research?
Contact me, Taylor Bell, at the Department of Psychology, Western Carolina University, Cullowhee, NC 28723 or by phone (828-712-1676) or e-mail (tay_may13@hotmail.com). You can also contact Dr. Shawn Acheson, Chair, Psychology Department at the same address (828-227-3368).

Please read the following statement before signing your name:

I am at least 18 years old. I have read and understood the information above. I understand that by signing this form I am agreeing to participate in the current study.

Name_____ Date_____
(Please Print)

Signature_____

APPENDIX B

Levenson Self-Report Psychopathy Scale

Listed below are a number of statements. Each represents a commonly held opinion and there are no right or wrong answers. You will probably disagree with some items and agree with others. Please read each statement carefully and circle the number which best describes the extent to which you agree or disagree with each statement, or the extent to which each statement applies to you.

1= Disagree strongly
2= Disagree somewhat
3= Agree somewhat
4= Agree strongly

1. I am often bored.	1	2	3	4
2. In today's world, I feel justified in doing anything I can get away with to succeed.	1	2	3	4
3. Before I do anything, I carefully consider the possible consequences.	1	2	3	4
4. My main purpose in life is getting as many goodies as I can.	1	2	3	4
5. I quickly lose interest in tasks I start.	1	2	3	4
6. I have been in a lot of shouting matches with other people.	1	2	3	4
7. Even if I were trying very hard to sell something, I wouldn't lie about it.	1	2	3	4
8. I find myself in the same kinds of trouble, time after time.	1	2	3	4
9. I enjoy manipulating other people's feelings.	1	2	3	4
10. I find that I am able to pursue one goal	1	2	3	4

for a long time.

11. Looking out for myself is my top priority.	1	2	3	4
12. I tell other people what they want to hear so that they will do what I want them to do.	1	2	3	4
13. Cheating is not justifiable because it is unfair to others.	1	2	3	4
14. Love is overrated.	1	2	3	4
15. I would be upset if my success came at someone else's expense.	1	2	3	4
16. When I get frustrated, I often "let off steam" by blowing my top.	1	2	3	4
17. For me, what's right is whatever I can get away with.	1	2	3	4
18. Most of my problems are due to the fact that other people just don't understand me.	1	2	3	4
19. Success is based on survival of the fittest; I am not concerned about the losers.	1	2	3	4
20. I don't plan anything very far in advance.	1	2	3	4
21. I feel bad if my words or actions cause someone else to feel emotional pain.	1	2	3	4
22. Making a lot of money is my most important goal.	1	2	3	4
23. I let others worry about higher values; my main concern is with the bottom line.	1	2	3	4
24. I often admire a really clever scam.	1	2	3	4
25. People who are stupid enough to get ripped off usually deserve it.	1	2	3	4
26. I make a point of trying not to hurt	1	2	3	4

others in pursuit of my goals.

APPENDIX C

M5:100 Questionnaire

David M. McCord, Ph.D., Western Carolina University

Name: _____ **Age:** _____ **M F**

Date: _____

Optional Fields

Phone: _____ **Email:** _____ **Ethnic identity**: _____

Custom Field #1: _____

Custom Field #2: _____

Custom Field #3: _____

This is a personality questionnaire, which should take about 10-15 minutes. There are no right or wrong answers to these questions; you simply respond with the choice that describes you best.

1 = Inaccurate 2 = Moderately Inaccurate 3 = Neither 4 = Moderately Accurate 5 = Accurate

If you feel that you cannot see the pages appropriately because of sight difficulties, cannot use a pencil well because of hand-motor problems, or know of any other physical, emotional, or environmental issues which would affect your performance on this test, please notify the testing administrator now.

If you feel extremely nervous about this testing process and feel that your nervousness will affect your performance, please notify the testing administrator so that they can answer any questions about this process and alleviate any fears. Please recognize that a degree of nervousness is normal for most testing.

Without spending too much time dwelling on any one item, just give the first reaction that comes to mind.

In order to score this test accurately, it is very important that you answer *every* item, without skipping any. You may change an answer if you wish.

It is ultimately in your best interest to respond as honestly as possible. Mark the response that best shows how you really feel or see yourself, not responses that you think might be desirable or ideal.

Items:

1. Worry about things
2. Am hard to get to know
3. Have a vivid imagination
4. Complete tasks successfully
5. Believe in the importance of art
6. Seldom feel blue
7. Have a sharp tongue
8. Am not interested in abstract ideas
9. Find it difficult to get down to work
10. Panic easily
11. Tend to vote for liberal political candidates
12. Am not easily bothered by things
13. Make friends easily
14. Often feel blue
15. Am easy to satisfy
16. Believe that I am better than others
17. Get chores done right away
18. Remain calm under pressure
19. Fear for the worst

20. Enjoy wild flights of fancy
21. Suspect hidden motives in others
22. Rarely get irritated
23. Do not like art
24. Dislike myself
25. Keep in the background
26. Do just enough work to get by
27. Am always prepared
28. Tend to vote for conservative political candidates
29. Avoid contacts with others
30. Seldom get mad
31. Talk to a lot of different people at parties
32. Do not like poetry
33. Feel comfortable with myself
34. Contradict others
35. Avoid philosophical discussions
36. Waste my time
37. Believe that too much tax money goes to support artists
38. Am relaxed most of the time
39. Warm up quickly to others
40. Believe that others have good intentions
41. Am very pleased with myself

42. Have little to say

43. Find it difficult to approach others

44. Have difficulty understanding abstract ideas

45. Need a push to get started

46. Feel comfortable around other people

47. Trust what people say

48. Am often down in the dumps

49. Have a rich vocabulary

50. Get stressed out easily

51. Do not enjoy going to art museums

52. Am concerned about others

53. Have frequent mood swings

54. Don't like to draw attention to myself

55. Insult people

56. Am not interested in theoretical discussions

57. Cheer people up

58. Do things according to a plan

59. Have a good word for everyone

60. Get back at others

61. Enjoy thinking about things

62. Carry out my plans

63. Keep others at a distance

64. Hold a grudge

65. Am filled with doubts about things

66. Would describe my experiences as somewhat dull

67. Carry the conversation to a higher level

68. Sympathize with others' feelings

69. Don't see things through

70. Am not easily frustrated

71. Am skilled in handling social situations

72. Rarely look for a deeper meaning in things

73. Respect others

74. Pay attention to details

75. Feel threatened easily

76. Am the life of the party

77. Enjoy hearing new ideas

78. Accept people as they are

79. Mess things up

80. Rarely lose my composure

81. Don't talk a lot

82. Can say things beautifully

83. Cut others to pieces

84. Make plans and stick to them

85. Know how to captivate people

86. Get excited by new ideas

87. Make demands on others

88. Am exacting in my work

89. Start conversations

90. Make people feel at ease

91. Shirk my duties

92. Don't mind being the center of attention

93. Treat all people equally

94. Finish what I start

95. Retreat from others

96. Am out for my own personal gain

97. Follow through with my plans

98. Leave things unfinished

99. Don't put my mind on the task at hand

100. Make a mess of things