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Sensation Seeking and Conscientiousness in Relation to Caffeine Consumption and Expectancy

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ABSTRACT

Habitual caffeine consumers often report difficulty reducing caffeine use with many continuing to use caffeine despite experiencing symptoms suggestive of substance dependence. Given the evidence of a positive association between sensation seeking and substance use as well as initial reports of a negative relationship between elevated conscientiousness and substance use, this study proposed to evaluate the relationship of both factors on caffeine consumption and expectancy. Two hundred sixty-five students in an introductory psychology course completed a series of brief surveys assessing caffeine consumption, caffeine expectancies, sensation seeking, and conscientiousness. A statistically significant positive correlation was hypothesized for sensation seeking and caffeine consumption as well as expectancy. It was also hypothesized that a statistically significant positive correlation would be seen for conscientiousness with caffeine consumption and expectancy. Two-tailed correlations were computed to test hypotheses, and analysis revealed relationships that varied from these predictions to a degree. Sensation seeking showed a significant positive correlation with caffeine consumption as predicted, however, no significant correlation for sensation seeking with caffeine expectancy was observed. Conscientiousness showed no significant correlation with self-reported caffeine consumption, but did show a significant negative correlation with caffeine expectancy. These results suggest that personality variables appear to play an important role on caffeine consumption practices and merit continued and thorough investigation.

Sensation Seeking and Conscientiousness in Relation to Caffeine Consumption and Expectancy

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I would like to dedicate my thesis to a woman who enjoyed her morning cup of coffee as much as her morning cigarette. A woman who felt no shame in her vices, but complete contentment in what she felt was earned to begin a day in this very complex, very hard world. My grandmother, Sharlyn Clinton.

You taught me that a woman does not have to be utterly poised, compliant, or refined to warrant respect or love. Rather, a woman can be whomever she naturally is, and she may be so without providing a single apology to any person who would wish her different. Because of you, I feel not an ounce of remorse in my own vices or imperfections. Instead I welcome all of my edges with a laugh, only feeling remorse for those who have rounded out their own to please this world.

Our years together were cut far too short, as I know this very complex, very hard world took too heavy a toll on you. But your spirit carries on, and you are felt with every strong breeze, every touch of a butterfly's wing, and every warm sip of coffee.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

LITERATURE REVIEW

Caffeine is the most widely consumed psychoactive substance in the world (Barone & Roberts, 1996; Huntley & Juliano, 2012; Paton & Beer, 2001; Rudolph, Faerbinger, & Koenig, 2014; Shohet & Landrum, 2001). In fact, caffeine is so widely consumed that little attention is given to reports that approximately 80% of the U.S. population voluntarily and routinely pharmacologically adjust arousal and performance through its' use (Lara, 2010). Caffeine can be obtained in coffee, tea, energy drinks, soft drinks, chocolate, and over-the-counter medications. Being readily available at a low cost and with a high degree of social acceptance and clear incentives, at least in comparison to other drugs, individuals can easily adjust their own dose, time of administration, and use intervals of caffeine intake according to the perceived benefits and side effects of each dose (Lara, 2010). Evidence from the fields of alcohol, glucose, and nicotine research indicates that one's expectancy concerning the nature of the substance consumed can exert a strong influence upon its perceived effects (Elliman, Ash, & Green, 2010). Therefore, knowledge of caffeine's stimulating effects may enhance subjective evaluation of arousal over and above routine pharmacological effect to a certain degree (Schneider et al., 2006).

In addition to expectancy of effect influences, the findings of several studies suggest that both general and specific personality traits may be significantly related to caffeine consumption practices (Penolazzi, Natale, Leone, & Russo, 2012). Given that

personality research has been helpful in identifying individual vulnerabilities to substance use and dependence (Sher, Bartholow, & Wood, 2000), a similar approach might provide such information with respect to caffeine use and personality factors (Jones & Lejuez, 2005).

Specifically, sensation seeking is a personality construct particularly relevant to substance use, with investigations of the relationship between the typical substances of dependence and this personality variable typically reporting significant, positive correlations (Lejuez et al., 2002; Wagner, 2001; Waldeck & Miller, 1997). Similarly, additional studies have reported significant, positive correlations between caffeine consumption and sensation seeking (Jones & Lejuez, 2005).

Alternatively, conscientiousness is a personality construct particularly relevant to health-enhancing behaviors, with research findings typically showing significant, negative correlations with health-damaging behaviors such as substance use and dependence. Interestingly, some evidence has been reported that higher levels of conscientiousness are associated with increased caffeine consumption (O'Connor, Conner, Jones, McMillan, & Ferguson, 2009). As the relationship between conscientiousness and caffeine consumption has received relatively little attention in empirical studies to date (O'Connor et al., 2009), a more precise articulation of the direction and intensity of this association merits further investigation. Taking together the current evidence of a positive association between sensation seeking and substance use with initial reports of a negative relationship between elevated conscientiousness and substance use, this study proposes to evaluate the relationship of both factors on caffeine consumption and expectancy.

Caffeine Consumption

Vehicles of Consumption

Eighty percent of the American population regularly consumes caffeine, with mean daily intake estimated between 200 and 250 mg (Barone & Roberts, 1996; Childs & De Wit, 2006; Lara, 2010; Paton & Beer, 2001; Shohet & Landrum, 2001). A greater proportion of the population reports regular caffeine usage than regular alcohol use, and regular caffeine users outnumber smokers by a ratio of three to one (Paton & Beer, 2001). Caffeine is a natural alkaloid found in coffee beans, tea leaves, cocoa beans, and cola nuts. It is consumed mainly in drinks, either as a natural component or an additive, as well as in analgesic and appetite-suppressant drugs and chocolate (Paton & Beer, 2001; Paulus et al., 2015).

The concentration of caffeine differs from product to product, and the caffeine content is extremely variable within product categories due to the growth and quality of plants, manufacturing procedures, and brewing techniques (Brice & Smith, 2002). With tea and coffee representing the primary sources for most caffeine consumers, people consume caffeine more often than any other drug. Once consumed, caffeine is rapidly distributed throughout the body and reaches its highest concentration in the bloodstream within 30 to 40 minutes of ingestion (Rogers, 2007). Beyond the enjoyment and sociability associated with drinking caffeine-containing beverages such as tea or coffee, caffeine also has “mental activating” properties which have resulted in its value as a psychostimulant agent (Lara, 2010; Rogers, 2007).

Similarly, the desire to elevate low levels of arousal via self-administration of caffeine may be an important factor in influencing levels of intake and patterns of

consumption (Brice & Smith, 2002). This implies that some part of the decision to self-administer caffeine is based upon the expectancy of realizing a stimulating effect.

Expectancy of Effect

Expectancy refers to an individual's belief about the anticipated outcome of a particular behavior; in our case, caffeine consumption (Huntley & Juliano, 2012). Studies have demonstrated that the effects of caffeine dosage on aspects of performance, such as reaction time, or subjective outcomes like arousal are more pronounced among participants holding expectancies that caffeine will produce those effects (Flaten, Aasli, & Blumenthal, 2003; Harrell & Juliano, 2009; Oei & Hartley, 2005). The majority of these studies have attempted to manipulate subjects' expectancies either by providing them with information regarding the psychological effects of caffeine, or by collecting prior information on their anticipated effects from caffeine use (Elliman et al., 2010).

A study by Flaten and colleagues (2003) explicitly tested the expectancy theory by comparing expectations with actual placebo responses. Their findings showed that subjects slightly but consistently overestimated the amount of arousal expected from consuming one or two cups of a caffeinated beverage compared to the actual effect of equivalent amounts of caffeine. Specifically, they reported that subjects' expectations about the effects of caffeine use were positively related to the actual effects of a caffeine placebo, and expectations about the effects of caffeine were related to the actual effects of caffeine (Flaten et al., 2003).

A similar study (Schneider et. al., 2006) attempted to delineate the pharmacologic and psychological effects of caffeine use. These researchers found that information about caffeine's stimulating effects enhanced participants' subjective evaluation of arousal over

and above the actual pharmacological effects to a certain degree. This finding suggests that psychological factors exert a significant effect over and above observed pharmacological effects (Schneider et. al., 2006).

Finally, Huntley and Juliano (2012) reported on the development of the Caffeine Expectancy Questionnaire (CaffEQ). In this study, the authors reported confirming hypotheses that expectancies for caffeine would predict both the frequency and quantity of caffeine consumed as well as features of substance dependence, such as withdrawal, tolerance, difficulty stopping use, and continued use despite knowledge of harmful consequences (Huntley & Juliano, 2012). Thus, it seems that when expectations held are seemingly met and result in the anticipated desired effect(s), chronic caffeine use may ensue.

Caffeine Dependence

Pharmacological Effects

While an oral dose of caffeine of approximately 250 mg produces generally desirable subjective effects such as elation and peacefulness and may play a role in recurrent consumption, higher doses are capable of producing more negative effects (Huntley & Juliano, 2012; Paton & Beer, 2001). A dose of caffeine of around 500 mg is potentially capable of producing tension, anxiety, irritability, and restlessness; and a dose of 600 mg or more can result in a syndrome known as caffeine intoxication, which is characterized by anxiety, insomnia, psychomotor agitation, excitement, nervousness, rambling speech, tachycardia, diuresis, and even delirium or psychosis (Huntley & Juliano, 2012; Paton & Beer, 2001). This condition is recognized by the *Diagnostic and Statistical Manual of Mental Disorders,* fifth edition (DSM-V), which also recognizes

caffeine withdrawal, naming symptoms such as headache, fatigue, and nausea (American Psychiatric Association, 2013). This leads to recognition that although caffeine is generally safe at usual daily doses, some of the behavioral features of caffeine use closely parallel behaviors associated with commonly recognized signs of drugs of dependence (Huntley & Juliano, 2012).

Signs of Dependence

Daily caffeine use has been shown to diminish the realized stimulant effect of acute doses (Addicott & Laurienti, 2009). That is, similar to the patterns of use seen with other drugs of dependence, chronic use of caffeine produces tolerance, which specifically means that repeated consumption leads to lessened effects of a given dose (Golsdstein, 2001; Huntley & Juliano, 2012). Also, similar to the effects seen with other drugs, periods of abstinence from caffeine may produce withdrawal symptoms including anxiety, depression, headaches, and vomiting, thereby hindering attempts at abstinence (Jones & Lejuez, 2005). Caffeine withdrawal symptoms are typically described to include this group of symptoms at a variable level of severity that emerge after cessation of a substance that is persistently used (Goldstein, 2001). This in turn usually results in a subsequent increase in consumption, as stimulatory effects are still desired and withdrawal symptoms sought to be avoided. Such greater use may then lead to the development of increased physical or psychological dependence (Jones & Lejuez, 2005).

Many habitual caffeine consumers report an inability to modify caffeine use despite the desire to do so, and such individuals may even continue to use caffeine despite experiencing symptoms suggestive of substance dependence (Huntley & Juliano, 2012). Caffeine dependence is often measured by the percentage of participants who

endorse the drug dependence criteria in the DSM-V. Dependence criteria include developing tolerance, experiencing withdrawal symptoms, experiencing a strong desire or making an unsuccessful attempt to stop usage, spending a great deal of time with the substance, using or consuming more than intended, using the substance despite knowledge of harm, and forgoing other activities to use or consume (American Psychiatric Association, 2013). Given these clear parallels between patterns of caffeine use and those seen with other drugs of dependence, the contribution that personality research has made in identifying correlates of drug dependence (Jones & Lejuez, 2005) would appear to be valuable to help identify potential vulnerabilities to caffeine use and dependence.

Personality Variables and Substance Use

Other Substances

Substance use has been studied from a variety of perspectives, and one of the most frequently investigated constructs has been personality (Horvath, Milich, Lynam, Leukefeld, & Clayton, 2004). Personality has received attention in literature as an explanatory factor for initial and continued substance use, with explored traits including neuroticism, extraversion, conscientiousness/constraint, and openness to experience (Horvath et al., 2004). Additionally, the trait of sensation seeking has been given considerable attention in relation to substance use. Sensation seeking is a personality trait characterized by the tendency to seek out varied and novel sensations and experiences (Hittner & Swickert, 2006). These experiences may include participation in risky physical activities, an attraction to novel political and philosophical ideologies, or

involvement in activities that are potentially habit-forming such as gambling and substance use (Hittner & Swickert, 2006).

In a 2009 study by Iwahashi and Aoki examining smoking behavior and personality traits, smokers and non-smokers completed the NEO-Five Factor Inventory (NEO-FFI). The NEO-FFI is a shorter version of the Revised NEO Personality Inventory (NEO-PI-R) that dimensionally assesses the personality factors of neuroticism, extraversion, openness, agreeableness, and conscientiousness. Results of this study showed that smokers scored significantly higher on the Openness scale than did non-smokers, and the most common answer to the question of why one started smoking in the first place was “out of curiosity” (Iwahashi & Aoki, 2009). Because of nicotine’s stimulating properties, a particular appeal to sensation seekers, or curious individuals, would appear to exist (Rezvanfard, Ekhtiari, Mokri, Djavid, & Kaviani, 2010).

Those in search of sensation do not appear to limit themselves to smoking, however. Relevant studies on personality and drinking behavior indicate, with few exceptions, a positive association between sensation seeking and alcohol use as well (Hittner & Swickert, 2006). A later study explored the association between sensation seeking and externalizing behaviors and found that elevated levels of sensation seeking characterized individuals who were more likely to use alcohol and other drugs, and that sensation seeking independently predicted behaviors such as frequency of alcohol and drug use (McCabe, Louie, & King, 2015).

Now, nicotine and alcohol are popular in the field of substance use and dependence, and typically hold extremely negative connotations. They have also demonstrated to be positively associated and easily identified with sensation seeking

behaviors. On the other hand, it has been suggested that the more widespread and socially acceptable a substance like caffeine is in a population, the less likely a relationship is likely to be found between use of the substance and elevated levels of sensation seeking (Kaynak et al., 2013).

Caffeine

Despite widespread attention in scientific investigations, delineation of individual and social factors capable of explaining variations in caffeine consumption is poorly understood in comparison with that of other drugs, possibly because caffeine is considered to have a low profile as a drug of abuse (Penolazzi et al., 2012). Nevertheless, some researchers have investigated caffeine use and personality correlates. One of these receiving attention has been having a morning or evening personality type. The observation that consumption of substances like caffeine appears to be intrinsically linked to the circadian rhythms and patterns of individual activation seems apparent, and has been articulated in studies addressing the morningness-eveningness dimension (Penolazzi et al., 2012). Evening-types have been shown to consume more caffeine in general, with coffee and cola serving as the primary sources, whereas intake from tea is higher for morning-types (Penolazzi et al., 2012). As a stimulant, caffeine has been consistently shown to increase arousal levels (Jones & Lejuez, 2005), and the desire to elevate low levels of arousal at certain times of day would appear to be a factor influencing levels of caffeine intake and patterns of consumption (Brice & Smith, 2002).

A positive correlation between caffeine consumption and extraversion has also been reported (Penolazzi et al., 2012), with some researchers suggesting that the effects of caffeine may be heavily related to having an extraverted personality type (Smillie &

Gökçen, 2010). Extroverts, according to Eysenck's theory (Eysenck, 1967), are chronically under-aroused and bored and are therefore in need of external stimulation to elevate arousal to an optimal level of performance (Acton, 2003). Similarly, another study (Croy, Springborn, Lötsch, Johnston, & Hummel, 2011) hypothesized a relationship between certain personality traits and sensory capacities, and they reported a significant positive relation between neuroticism and enhanced detection of sensitivity. Neuroticism, according to Eysenck's theory, is based on activation thresholds in the sympathetic nervous system (Acton, 2003). That is, neurotic people have lower activation thresholds and are thus more sensitive to external stimuli.

This is interesting, specifically given that related studies have shown that high sensation seekers are more sensitive to external stimuli than low sensation seekers (Stoops et al., 2007). Assessing relative sensitivity to external stimuli and the reinforcing effects of stimulant drugs would make it possible to determine whether high sensation seekers are more likely to engage in repeated use following initial use, and in turn would be increasingly vulnerable to overuse and dependence (Stoops et al., 2007). Since caffeine is the most widely used stimulant substance and is capable of leading individuals to physical and psychological dependence, delineation of the extent and direction of these relationships would be helpful.

Caffeine Use and Sensation Seeking

Sensation seeking, impulsivity, and risk taking propensity are personality constructs that are particularly relevant to substance use (Jones & Lejuez, 2005). Specifically, sensation seeking and impulsivity have been positively linked to heavy caffeine consumption. The documented relationship between sensation seeking and

impulsivity seen with other drugs may also be identified with patterns of caffeine consumption for a couple of reasons (Jones & Lejuez, 2005). First, individuals high in sensation seeking may search for ways to increase their level of arousal, which caffeine has been consistently shown to do (Jones & Lejuez, 2005). Second, it may be that increased levels of impulsivity and sensation seeking together influence current arousal states, with those high in both impulsivity and sensation seeking experiencing lower baseline levels of arousal and engaging more frequently in behaviors designed to raise arousal (Jones & Lejuez, 2005).

In a study conducted to determine factors capable of predicting daily caffeine intake (Penolazzi et al., 2012), the authors report finding that both sensation seeking and impulsivity were significantly associated with increased caffeine intake, with people scoring high in these traits showing greater amounts of caffeine ingestion. It is plausible that these individuals were consuming caffeine in greater amounts for the purpose of increasing their level of arousal. Another study reported that novelty-seeking scores were significantly higher in subjects with heavy caffeine intake than among both moderate consumers and non-consumers of caffeine (Gurpegui et al., 2007). Novelty-seeking is typically conceptualized as a temperamental dimension of sensation seeking, characterized by the tendency to seek out-of-the-ordinary experiences (Acton, 2003). Additionally, elevated levels of impulsivity were found to be significantly associated with heavy caffeine intake (Gurpegui et al., 2007). Using self-report measures of sensation seeking and impulsivity, an additional study (Jones & Lejuez, 2005) reported that higher scores on these dimensions were related to increased reported caffeine consumption and dependence.

Similar findings have been reported for other drugs, with individuals who use drugs often scoring higher on sensation seeking scales than those who do not report using drugs (Jones & Lejuez, 2005). As sensation seeking appears to potentially play an influential role in the decision to consume or even overconsume caffeine, and also given the evident parallels between caffeine use and the use patterns of other drugs of dependence, it seems reasonable to specifically explore the relationship between conscientiousness and caffeine use as well.

Caffeine Use and Conscientiousness

With respect to reported levels of alcohol and drug use, individuals who score lower on scales measuring conscientiousness have been identified as at risk for substance use and dependence (Klimstra, Luyckx, Hale, & Goossens, 2014). This may be due to the fact that conscientiousness is generally shown to be negatively related to health-damaging behaviors (e.g., drug and alcohol use) and positively related to health-enhancing behaviors (Bogg & Roberts, 2004). These individuals have also been reported to score higher on scales measuring neuroticism, extraversion, and openness to experience (Klimstra et al., 2014). Simply stated, individuals who are higher in conscientiousness appear to be less likely to engage in health-damaging behaviors, while individuals who are lower in conscientiousness are more likely to engage in health-damaging behaviors.

Integrating these strands, it seems wise to assess conscientiousness and sensation seeking simultaneously, in relation to caffeine use. Caffeine is consumed daily by many people, and is considered to be the most widely consumed psychoactive substance in the world (Barone & Roberts, 1996; Gilbert, 1984; Huntley & Juliano, 2012; James, 1991;

Paton & Beer, 2001; Rudolph et al., 2014; Shohet & Landrum, 2001). Many behavioral features of caffeine use closely parallel the behaviors associated with commonly recognized drugs of dependence (Huntley & Juliano, 2012), including the development of tolerance, psychological and physical dependence, and even the experience of withdrawal (Golsdstein, 2001; Huntley & Juliano, 2012; Jones & Lejuez, 2005). Sensation seeking as a shared personality variable has been seen to relate to substance use and appears to relate to caffeine use as well. The potential role of conscientiousness as a shared personality variable actually relating to patterns of caffeine use, however, is less well understood to date.

Relatively few studies to date have examined the relationship between caffeine use and conscientiousness. Personality facets such as neuroticism, extraversion, impulsivity, and sensation seeking have instead captured the attention of most researchers. However, one study (O'Connor et al., 2009) sought to examine the direct relationship of conscientiousness to a range of daily health behaviors and reported some interesting results with regard to caffeine usage. First, looking at daily hassles and health behavior relations, the authors reported finding a significant positive association between the number of daily hassles experienced and elevated scores on their measure of caffeine consumption. That is, on days when a greater number of hassles were experienced, individuals reported consuming significantly more caffeinated beverages (O'Connor et al., 2009). Also, when they looked at total conscientiousness and health behavior relations, a positive association was found between higher conscientiousness scores and higher caffeine consumption, indicating that individuals high in conscientiousness reported consuming more caffeinated beverages than individuals low in

conscientiousness (O'Connor et al., 2009). Finally, when they looked specifically at the facets of conscientiousness and health behavior relations, O'Connor and colleagues (2009) found that for caffeine, higher scores on achievement striving and cautiousness were associated with a greater consumption of caffeinated beverages. Clearly, this project found evidence that higher levels of conscientiousness were associated with higher caffeine intake patterns (O'Connor et al., 2009).

These results are worthy of attention, as they raise the question of how conscientiousness may influence self-regulation processes. More directly, they suggest that the influence of conscientiousness may differ between commonly recognized drugs of dependence and caffeine. It appears plausible that individuals high in conscientiousness are more sensitive to the stimulatory benefits of caffeine and use it as a means to facilitate achievement and attentional focus in varying contexts (O'Connor et al., 2009). Still further research is needed to empirically explore this notion. What is clear from the research summarized here is that a significant relationship has unexpectedly been found between higher levels of conscientiousness and higher caffeine consumption. This is unexpected in the sense that past drug and alcohol research has shown a significant relationship between low levels of conscientiousness and higher drug and alcohol use. So, it seems logical to investigate the individual relationships between caffeine consumption and the personality variables of sensation seeking and conscientiousness.

Current Study

Caffeine is so widely consumed and accepted in society that little attention is paid to the fact that about 80% of the population voluntarily and routinely manipulate arousal

and attentional abilities through its use (Lara, 2010). Further, since it is readily available at a low cost and highly accepted in social contexts, many habitual users of caffeine report an inability to decrease or discontinue use despite the desire to do so, with many continuing use despite experiencing symptoms indicative of a substance dependence problem (Huntley & Juliano, 2012). This warrants recognition as it reveals that some behavioral features of caffeine use closely parallel behaviors associated with commonly recognized drugs of dependence (Huntley & Juliano, 2012). Thus, it is important to identify individual vulnerabilities to caffeine overconsumption and dependence.

Research in the fields of alcohol, glucose, and nicotine indicates that expectancy concerning the nature of a substance consumed exerts a strong influence upon its perceived effect (Elliman, Ash, & Green, 2010). Information about caffeine's stimulating effects are reported to enhance subjective evaluation of arousal (Schneider et al., 2006) and may lead to the desire to continually elevate arousal levels. Moreover, personality research suggests that sensation seeking is a personality construct particularly relevant to substance use (Lejuez et al., 2002; Wagner, 2001; Waldeck & Miller, 1997), and studies have found a positive correlation between sensation seeking and caffeine consumption as well (Jones & Lejuez, 2005). However, caffeine use with the personality construct of conscientiousness may show a departure from the pattern seen with other substances. While a lower level of conscientiousness is typically associated with increased substance use, evidence has been reported suggesting that a higher level of conscientiousness is associated with increased caffeine consumption (O'Connor et al., 2009). In light of this observation, further investigation of the unique relationship between sensation seeking and caffeine use as well as conscientiousness and caffeine use is warranted. It is predicted

that individuals who are high in sensation seeking and high in conscientiousness will report consuming caffeine at a higher level and display signs of dependence.

CHAPTER II

METHODOLOGY

Participants

The participants in this study were 265 undergraduate students attending Abilene Christian University who were enrolled in the Introduction to Psychology course. One hundred sixty-five reported that they were classified as Freshmen, 59 reported being Sophomores, 21 reported that they were Juniors, and 17 reported they were Seniors. Of these participants, 108 reported that they were male and 154 female. Four identified their ethnicity as American Indian or Alaskan Native, 9 as Asian or Asian American, 32 as Black or African American, 42 as Hispanic or Latino, and 175 as Non-Hispanic/White. The average reported age of participants was 19.2 years. Participants were asked to complete a series of four questionnaires measuring caffeine consumption, caffeine expectancies, level of sensation seeking, and level of conscientiousness.

Measures

Four self-report measures were used in the current study. These included the Caffeine Consumption Questionnaire, Caffeine Expectancy Questionnaire, Zuckerman Sensation Seeking Scale Form-V, and International Personality Item Pool. Each of these have been widely used and statistically validated. The first assessed the amount of caffeine consumed, the second assessed expectancies held about the caffeine consumed, the third assessed level of sensation seeking, and the fourth assessed level of conscientiousness.

Caffeine Consumption Questionnaire (CCQ)

The CCQ was developed and refined as an instrument designed to precisely measure self-reported weekly caffeine use. The authors state that it provides a consistent tool for the measurement of caffeine consumption. Use of the CCQ adds precision to the measure of caffeine consumption in a number of ways (Shohet & Landrum, 2001).

First, by recording weekly totals of caffeine use as well as recording substances used at least once a week, fluctuations in day-to-day caffeine use are avoided. Second, five different coffee categories rather than one are included, as well as tea, chocolate, and cocoa. There are also 36 different soft drinks and 7 different types of over-the-counter medications included in the inventory. Third, the time of day, referring to when consumption took place, is included. This allows analysis of both frequency and magnitude of caffeine consumption by the time of day, and all of these variables can be examined simultaneously (Shohet & Landrum, 2001). For these reasons, the CCQ offers general users and researchers a precise and consistent measure of caffeine use, and can be further used as a tool to pursue other potential relationships between individual characteristics and caffeine use (Landrum, 1992).

Caffeine Expectancy Questionnaire (CaffEQ)

Expectancies for drug effects predict initiation, use, cessation, relapse, and may even play a causal role in drug effects (Huntley & Juliano, 2012). The CaffEQ was developed as a comprehensive and psychometrically sound measure of caffeine expectancies, so that the nature and scope of caffeine expectancies among caffeine consumers and non-consumers in the general population could be explored (Huntley & Juliano, 2012). The CaffEQ was constructed and validated across four separate studies

using independent samples. Exploratory factor analysis yielded a seven-factor solution: withdrawal/dependence, energy/work enhancement, social/mood enhancement, appetite suppression, physical performance enhancement, anxiety/negative physical effects, and sleep disturbance. Internal consistency of all seven subscales was high, ranging from .85 to .97, suggesting that items making up each subscale have a strong relationship to each other and likely may reflect a common underlying construct (Huntley & Juliano, 2012). Following item development, an independent sample of individuals completed the CaffEQ along with other measures, and a subset of this sample then completed the CaffEQ once more approximately 2 weeks later. Confirmatory factor analysis revealed good model fit, with strong test-retest reliability (Huntley & Juliano, 2012). Identical findings between each of the four studies assessing caffeine expectancies and caffeine use, caffeine expectancies and caffeine dependence symptoms, caffeine vehicles, anxiety, sleep, and alcohol use also suggested good external validation of the CaffEQ (Huntley & Juliano, 2012). Thus, the CaffEQ is considered capable of facilitating the advancement of knowledge of caffeine expectancies and use as well as drug expectancies and use in general (Huntley & Juliano, 2012).

Zuckerman Sensation Seeking Scale – Form V (SSS-V)

The purpose of developing form V of the SSS was to create a new shorter form of the SSS based on its four factors (Zuckerman, 1978). Those four factors include thrill and adventure seeking, experience seeking, disinhibition, and boredom susceptibility. On the basis of these four factors, items were selected for the new form using items for each factor that met the criteria of having a primary loading on the same factor in all samples, and loadings exceeding .30 in magnitude (Zuckerman, 1978). In this manner, 10 items

were selected for each of the four primary factors in the SSS to comprise form V, and a total score for this new form is obtained by summing the four subscale scores (Zuckerman, 1978). Reliabilities of the form V factor scales were anticipated to be somewhat low because the scales were shorter. However, the only substantial drop in reliability was on the experience seeking scale where reliabilities fell from .7 and .8 to .6, still falling within acceptable limits (Zuckerman, 1978). The three remaining showed little loss in reliability (Zuckerman, 1978). It was also hoped that correlations between the factor scales in form V would have more independence than what was shown in the original form. Upon construction, it was shown that correlations among the subscales were in fact reduced in form V (Zuckerman, 1978). And so, form V of the SSS has the advantage of reducing interscale correlations between component factor scores with little loss in reliability of these scores (Zuckerman, 1978). Form V is therefore considered to be efficient and useful in furthering research on sensation seeking in varying populations (Zukerman, 1978).

International Personality Item Pool (IPIP-NEO)

Likely in response to increasing demand for open-access and cost-efficient assessment tools, the IPIP-NEO, a free and publically available measure of the Five Factor Model of personality was developed (Maples, Guan, Carter, & Miller, 2014). The FFM measures the personality constructs of openness, conscientiousness, extraversion, agreeableness, and neuroticism. Given that the NEO PI-R is a widely used and well-validated measure of the FFM facets, it served as the parent model in development. In order to quantify the similarity of the patterns and correlations between the IPIP-NEO and its parent model, internal consistency, convergent validity, criterion validity, and

discriminant validity were measured. Scores from the IPIP-NEO manifested good internal consistency as demonstrated by both coefficient alphas and MICs (Maples et al., 2014). Scores also demonstrated strong convergent validity in relation to the NEO PI-R, as the mean convergent validity correlation across scores was .77, demonstrating that scores from the scale correlate relatively strongly with parallel dimensions from the parent NEO PI-R scale (Maples et al., 2014). Further, scores on the IPIP-NEO manifested nearly identical criterion validity when compared with the NEO PI-R, and discriminant validity was acceptable across scores (Maples et al., 2014). The IPIP-NEO then demonstrates strong convergence with the NEO PI-R, and strong support for its use has been provided (Maples et al., 2014).

Procedure

Participants were recruited from the Introduction to Psychology course, where the course instructor presented the opportunity to enrolled students. Participants were asked to complete a series of four questionnaires measuring caffeine consumption, caffeine expectancies, level of sensation seeking, and level of conscientiousness. These questionnaires were distributed electronically as one survey in its entirety, and informed consent was obtained electronically prior to participation. A signature was not collected in the informed consent; rather, the last sentence stated: “By completing the surveys on the following pages, you are giving consent to participate in this study.” Participants were awarded extra credit upon completion of the survey. If any students chose not to participate in the survey, an alternative method to earn equivalent course extra credit was provided. This alternative involved writing a 600-word reflection paper addressing how the student’s faith has been impacted by the ACU experience. It was expected that the

paper would take about the same amount of time as completing the surveys. Following completion, data was entered in Statistical Package for the Social Sciences (SPSS) (IBM, 2013) and scale scores were tabulated for statistical analysis. The project was approved by and conducted under the authority of the Institutional Review Board of Abilene Christian University.

CHAPTER III

RESULTS

Sensation Seeking With Caffeine Consumption and Expectancy

It was hypothesized that a statistically significant positive correlation would be observed for sensation seeking with caffeine consumption as well as expectancy. To assess this hypothesis, two-tailed correlations were computed in SPSS. As presented below in Table 1, the results showed a statistically significant, positive correlation between sensation seeking and caffeine consumption ($r = .132$, $p < .05$). However, a statistically significant positive correlation between sensation seeking and caffeine expectancy was not observed

Table 1

Correlation Between Sensation Seeking and Caffeine Consumption

	Caffeine Consumption	Caffeine Expectancy	Sensation Seeking
Caffeine Consumption		.102	.132*
Caffeine Expectancy			-.042
Sensation Seeking			

Note: $*p < .05$ $**p < .01$

Conscientiousness With Caffeine Consumption and Expectancy

It was also hypothesized that a statistically significant positive correlation would be seen for conscientiousness with caffeine consumption and expectancy. Two-tailed

correlations were computed in SPSS to test this hypothesis as well, with results failing to indicate the presence of any statistically significant relationship between conscientiousness and caffeine consumption, as presented in Table 2. Alternatively, the results did show a statistically significant negative correlation between conscientiousness and caffeine expectancy (r = -.128, $p < .05$). Correlation coefficients for caffeine consumption, expectancy, and sensation seeking with the other personality constructs measured by the IPIP-NEO are also presented in Table 2 and are discussed below.

Table 2

Correlation Coefficients for Caffeine Consumption, Caffeine Expectancy, and Sensation Seeking

	Caffeine Consumption	Caffeine Expectancy	Sensation Seeking
Openness	-.107	-.128*	.129*
Conscientiousness	-.045	-.128*	.033
Extraversion	-.050	-.041	-.029
Agreeableness	-.122	-.041	.061
Neuroticism	.051	.196**	-.135*

Note: *$p < .05$ **$p < .01$

Other Personality Variables With Caffeine Consumption and Expectancy

Exploratory two-tailed correlations were also computed in SPSS for the other IPIP-NEO dimensions of Openness, Extraversion, Agreeableness, and Neuroticism with caffeine consumption, expectancy, and sensation seeking. Inspection of these results reveals a couple of other statistically significant relationships between personality constructs other than sensation seeking and conscientiousness with caffeine consumption

and expectancy. Specifically, results showed a significant negative correlation between openness and caffeine expectancy, as well as a significant positive correlation between openness and sensation seeking. Results also showed a significant positive correlation between neuroticism and caffeine expectancy, as well as a significant negative correlation between neuroticism and sensation seeking (see Table 2).

Gender Differences

Exploratory analyses were also conducted examining gender differences in caffeine consumption, caffeine expectancy, sensation seeking, and conscientiousness. Statistical analysis revealed statistically significant differences between males and females and their self-reported levels for three of these four variables. Results showed no significant difference between males and females with regard to caffeine consumption. Statistically significant differences were observed for males and females with regard to caffeine expectancy ($p = .011$), with females endorsing a greater degree of caffeine expectancy. With regard to the personality variables, males were observed to report a higher level of sensation seeking ($p = .003$) and females a higher level of conscientiousness ($p = .011$). These results are presented in Table 3.

Table 3

Gender Differences in Caffeine Consumption, Caffeine Expectancy, Sensation Seeking, and Conscientiousness

	Gender	N	Mean	Std. Deviation	Sig. (2-tailed)
Caffeine Consumption	Male	81	170.9136	56.24282	.624
	Female	114	167.2105	48.55131	
Caffeine Expectancy	Male	97	116.0928	43.37412	.011*
	Female	137	130.2482	39.88490	
Sensation Seeking	Male	95	59.3053	4.28276	
	Female	136	57.7941	3.00646	.003**
Conscientiousness	Male	92	82.1848	12.78214	.011*
	Female	127	86.7717	13.22407	

Note: $*p < .05$ $**p < .01$

CHAPTER IV

DISCUSSION

Caffeine is the most widely consumed psychoactive substance in the world (Huntley & Juliano, 2012; Paton & Beer, 2001; Rudolph et al., 2014; Shohet & Landrum, 2001). In fact, caffeine is so widely consumed that relatively little attention is given to reports that approximately 80% of the U.S. population voluntarily and routinely adjust arousal and performance through caffeine use (Lara, 2010). Being readily available at a low cost and with a high degree of social acceptance, at least in comparison to other drugs, individuals can easily adjust their own dose, time of administration, and use intervals of caffeine intake according to the perceived benefits and side effects of each dose (Lara, 2010). Although caffeine is generally safe at usual daily doses, some of the behavioral features of caffeine use can closely parallel behaviors associated with commonly recognized signs of drugs of dependence (Huntley & Juliano, 2012). That is, many habitual users of caffeine report an inability to decrease or discontinue use despite the desire to do so, and continue use despite experiencing symptoms indicative of a substance dependence problem (Huntley & Juliano, 2012). Furthermore, evidence from the fields of alcohol, glucose, and nicotine research indicates that one's expectancy concerning the nature of a substance consumed can exert a strong influence upon its perceived effects (Elliman et al., 2010). Even more, it can exert a strong influence upon whether or not a person continues using a substance. Information about caffeine's

stimulating effects are reported to enhance subjective evaluation of arousal (Schneider et al., 2006) and may lead to the desire to continually elevate arousal levels.

Personality research further suggests that both general and specific personality traits may be significantly related to caffeine consumption (Penolazzi et al., 2012). Sensation seeking, impulsivity, and risk taking propensity are personality constructs that appear to be particularly relevant to substance use (Jones & Lejuez, 2005), and both sensation seeking and impulsivity specifically have been positively linked to heavy caffeine consumption. Alternatively, conscientiousness is a personality construct particularly relevant to health-enhancing behaviors, with research findings typically showing significant, negative correlations with health-damaging behaviors such as substance use and dependence. So it is interesting that some evidence has been reported that higher levels of conscientiousness are associated with increased caffeine consumption (O'Connor et al., 2009). Sensation seeking as a personality variable then, has been seen to relate to substance use, and appears to relate to caffeine use as well. The potential role of conscientiousness as a shared personality variable actually relating to patterns of caffeine use, however, is less well understood to date. As this relationship between conscientiousness and caffeine consumption has received relatively little attention in empirical studies to date (O'Connor et al., 2009), a more precise articulation of the direction and intensity of this association merited further investigation.

Hypotheses

Given the evidence of a positive association between sensation seeking and substance use along with the initial reports of a negative relationship between elevated conscientiousness and substance use, this study proposed to evaluate the influences of

both factors on caffeine consumption and expectancy. It was predicted that upon conclusion of the study, two specific relationships would be revealed. The first would show that the personality construct of sensation seeking is significantly and positively correlated with caffeine consumption and expectancy. That is, the higher an individual scored on the sensation seeking scale, the more caffeine they would report consuming and the more likely they would be to hold a greater expectation of effect. The second would show that the personality construct of conscientiousness would be significantly and positively correlated with caffeine consumption and expectancy. That is, the higher an individual scored on the conscientiousness dimension, the more caffeine an individual would report consuming and the more likely they would be to hold a greater expectation of effect from caffeine. No specific relationships with caffeine use or expectancy were predicted for the other personality dimensions assessed by the IPIP-NEO which were included for exploratory interests.

Findings

Statistical analysis revealed relationships that varied from these predictions. With regard to sensation seeking, results did show a significant positive correlation with caffeine consumption. However, no significant correlation for sensation seeking with caffeine expectancy was observed. Though sensation seeking was expected to positively correlate with both consumption and expectancy, the positive correlation with consumption alone provides support for a portion of the original hypothesis, providing evidence that individuals scoring higher on sensation seeking will report consuming more caffeine than individuals scoring lower on sensation seeking. With regard to conscientiousness, no significant correlation for this personality construct was observed

for self-reported caffeine consumption. Results did, however, indicate the presence of a significant negative correlation between conscientiousness and caffeine expectancy. This observation differs from the stated hypothesis. First, it does not provide support for the idea that individuals scoring higher in conscientiousness will report consuming more caffeine than individuals scoring lower in conscientiousness. Instead, observed results suggest that individuals scoring higher in conscientiousness will hold a significantly reduced expectation of caffeine's effect than individuals scoring lower in conscientiousness.

Interestingly, results of statistical analyses also revealed other significant relationships that were not directly targeted in the study. Alongside sensation seeking and conscientiousness, the personality constructs of openness, extraversion, agreeableness, and neuroticism were also measured through use of the IPIP-NEO. Analysis of these exploratory results did not support the extraversion hypothesis, as no significant correlation between extraversion and levels of caffeine consumed was observed. On the other hand, analysis did show a significant negative correlation between openness and caffeine expectancy, as well as a significant positive correlation between openness and sensation seeking. That is, those individuals higher in openness held a lessened expectation of the effect of caffeine use, but also rated themselves higher in sensation seeking. While it seems logical that an individual who is high in openness is also high in sensation seeking, given the similarity of these constructs, it seems less clear as to why an individual who is high in openness would have a reduced expectation of the effect of caffeine. Given that an individual higher in openness is more open to experiences, it seems as though that individual would expect more of an effect from caffeine, rather than

less. Results also showed a significant positive correlation between neuroticism and caffeine expectancy, as well as a significant negative correlation between neuroticism and sensation seeking. That is, those individuals higher in neuroticism held more of an expectation of the effect of caffeine, but were tended to score lower in sensation seeking. It could be that since individuals higher in neuroticism are more sensitive to external stimuli, thus their expectation of the effect that caffeine will have on them is greater than individuals who are lower in neuroticism, anticipating a range of effects once caffeine is consumed. This sensitivity to external stimuli may also play a role in why they are lower in sensation seeking, as being aware of their sensitivity may lead them to shy away from seeking out other novel experiences that could lead to their being over-stimulated. The need to seek sensation is not necessarily present, because they are already easily stimulated by the outside world. Each of these findings pertaining to openness and neuroticism is intriguing and warrants further investigation in caffeine research.

Implications

Caffeine is not commonly recognized as a drug of dependence, as it is generally socially acceptable and easily accessible in every day contexts. Even so, the *Diagnostic and Statistical Manual of Mental Disorders,* Fifth Edition (DSM-V) recognizes the condition of caffeine intoxication as well as the condition of caffeine withdrawal, and groups both with conditions caused by other drugs of dependence (American Psychiatric Association, 2013). This leads to recognition that although caffeine is generally safe at usual daily doses, some of the behavioral features of caffeine use closely parallel behaviors associated with commonly recognized signs of drugs of dependence (Huntley & Juliano, 2012). Substance use has been studied from a variety of perspectives, and one

of the most frequently investigated constructs has been the relationship of various personality traits with caffeine use (Horvath et. al., 2004). Given that personality research has been helpful in identifying individual vulnerabilities to substance use and dependence (Sher et al., 2000), a similar approach providing such information with respect to caffeine use and personality factors is attractive (Jones & Lejuez, 2005).

This study specifically examined the personality constructs of sensation seeking and conscientiousness in terms of their relationships with an individual's caffeine consumption and expectancy of effect. Results indicated that, similar to other drugs of dependence, individuals higher in sensation seeking reported consuming more caffeine than individuals lower in sensation seeking. Also similar to other drugs of dependence, it was observed that individuals higher in conscientiousness held less of an expectation of caffeine's effect than individuals lower in conscientiousness.

Although observed results differed to a degree from what was initially predicted, these findings carry meaningful implications. Daily caffeine use has been shown to diminish the realized stimulant effect of acute doses (Addicott & Laurienti, 2009). That is, similar to the patterns of use seen with other drugs of dependence, chronic use of caffeine produces tolerance (Goldstein, 2001; Huntley & Juliano, 2012). Furthermore, periods of abstinence from caffeine may produce withdrawal symptoms including anxiety, depression, headaches, and vomiting, thereby hindering successful attempts to abstain (Jones & Lejuez, 2005). Additionally, continued use may then lead to the development of increased physical or psychological dependence (Jones & Lejuez, 2005). Researchers and practitioners are equally obligated to be aware of what can cause or contribute to an individual becoming physically or psychologically unable to function at

their healthiest degree. Substances that lead to dependence, including caffeine, are factors which can cause or contribute to impaired functioning, because if a dependent individual is deprived of what they are dependent upon, they are unable to function at their healthiest degree.

Personality research has been successful in identifying factors that leave individuals more vulnerable to substance use and dependence (Sher et al., 2000). That is, identified personality variables have served as useful in determining whether an individual is more likely to become physically or psychologically dependent upon a substance. With regard to caffeine, this may also be the case. This study revealed that individuals who were high in sensation seeking were more likely to report consuming caffeine at greater levels, and individuals who were low in conscientiousness were more likely to expect a greater effect from their caffeine consumption. Both of these patterns, higher consumption and greater expectancy of effect, likely contribute to excessive use of caffeine and possible overconsumption and resulting dependence. For researchers, this means that similar to the way personality research has aided the study of drug, alcohol, and nicotine use, personality research may also aide the study of caffeine use. The majority of caffeine research to date has focused on cognitive enhancement and achievement, with the aim to either unravel or substantiate myths of the effect caffeine has on a person's cognitive abilities. Much less attention has been given to empirical investigation of the question of a person's personality and the role it may play in normal or unhealthy patterns of caffeine use. It would appear prudent to continue investigation of these possible links so that a clearer understanding of factors related to caffeine overconsumption and dependence could be ascertained.

Similarly, with respect to practitioners, this information could be beneficial in clinical use as well. When consumed in high dosages, caffeine is capable of producing negative psychological effects that include tension, irritability, restlessness, nervousness, anxiety, insomnia, psychomotor agitation, and even delirium or psychosis (Huntley & Juliano, 2012; Paton & Beer, 2001). If caffeine is being consumed at high enough levels to produce these effects, and on a frequent basis, it is possible that an individual could end up sincerely suffering. If help is then sought for any one of these symptoms, it is imperative for mental health practitioners to be thorough in their exploration for what may be causing or contributing to their problem(s). With 80% of the U.S. population consuming caffeine through every day products like coffee, tea, energy drinks, soft drinks, chocolate, and over-the-counter medications (Lara, 2010), knowledge of the effects caffeine has on a person's psychological well-being is necessary. Moreover, it is necessary to be knowledgeable of whether or not an individual has become dependent upon their caffeine use, as that may be impeding everyday functioning and psychological health to a significant degree. This is where the question of personality raised by this study and other research also poses valuable insights. This study allows us to observe that certain personality traits may correlate with certain behaviors considered to be unhealthy; namely, caffeine overconsumption and dependence. If facets of personality can be connected to unhealthy behavioral patterns, such as unhealthy patterns of caffeine use, they may also potentially be connected to additional unhealthy behaviors worthy of empirical study. Therefore, it is possible that making this connection could be instrumental in better understanding an individual's problem(s), going beyond what is initially observed.

Limitations and Future Research

This study should be reviewed in its entirety with consideration of a few limitations. First, the sample utilized for the study was comprised of college students, who more than likely use caffeine frequently as both a social norm and as a means to remain stimulated for primarily academic purposes (studying, assignment completions, test-taking, etc.). This is important to recognize as their motivation for consumption may hold greater specificity than a non-student population. Second, the participants were assessed as a part of an academic setting, and were not prompted to consider caffeine use patterns and expectancies in other settings such as workplace, social gatherings, or home. This again may factor into their level of consumption of the stimulatory substance as well as their expectancy of its effect. Third, the CaffEQ was used as a sum total in statistical analysis, and potentially different or more definitive results may have been observed if the seven factor scores were utilized instead. Fourth, this study did not explore gender differences in caffeine consumption or expectancy. There is possibility that gender influences do exist in the level of caffeine consumed by an individual, as well as what that individual expects from the substance. Fifth, and in line with this, gender differences were not explored regarding the personality constructs of sensation seeking and conscientiousness. There is possibility that gender influences do exist in an individual's level of sensation seeking or conscientiousness, and that such should be considered when measuring these personality constructs against any tangible behavior. Taken together, readers should be knowledgeable of these limitations when considering the findings of this study.

For future research ventures, a few additional considerations are worthy of mention. First, the extent to which caffeine expectancy solely influences the level of caffeine a person consumes on a daily basis needs to be specifically examined. This study looked at the relationship of personality to caffeine consumption and expectancy, it did not look at how expectancy initially drives an individual to consume less or more caffeine. Second, the influence of conscientiousness on caffeine consumption and expectancy warrants study. Though sensation seeking has been frequently studied in regard to substance use and even caffeine use, such as in this study, conscientiousness has been much less studied in its relationship to caffeine use. This study showed a significant negative relationship between conscientiousness and caffeine expectancy, but showed no relation to caffeine consumption. Further studies should use varying methods to explore the potential foundational connection between conscientiousness and caffeine consumption, as well as further assess its connection to caffeine expectancy. Third, exploring other personality dimensions in relation to caffeine use and expectancy appears promising. For example, even though neuroticism was not a targeted personality construct in this study, results did reveal its significant and positive correlation to caffeine expectancy. It may be beneficial to further investigate this relationship, and how it may play a role in levels of consumption. Fourth, the relationship between stress and caffeine use also merits attention in future research. Previous studies have observed the role stress plays in health-enhancing or health-damaging behaviors. With substance use and dependence serving as a health-damaging behavior, it may be enlightening to understand how stress and habits of caffeine use (either healthy or unhealthy) relate to one another. Lastly, gender influences on caffeine use deserves further exploration. As noted earlier,

this study did not assess gender influences or differences in caffeine consumption or expectancy. A future study examining gender influences or differences might reveal noteworthy findings on the relationship between gender and caffeine use that could contribute to the areas of caffeine research and treatment. As such, these extensions would potentially expand on the contribution of this preliminary study and further efforts to understand and treat caffeine use problems.

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APPENDIX A

INFORMED CONSENT

You have been invited to participate in a study investigating personality factors related to caffeine overconsumption and dependence. The decision to participate is completely voluntary. If you decide to participate, you will be asked to complete four brief surveys as well as provide some basic demographic information. It is estimated that this will require between 30 and 60 minutes of your time.

No risks are anticipated for you by participating in the study. Maintaining confidentiality will be given highest priority and will minimize any potential risks. A possible risk could exist if a breach of confidentiality occurred, resulting in your responses or personal information being released. Steps will be taken to ensure that any information you provide will remain confidential and intact. Specifically, your responses will only be used for data analysis and will not be shared with anyone outside of our research team. Additionally, your name and other personal information will not be collected for this research project. The only identifying information we will request will be your Banner ID and this will be used for the purpose of identifying you to allow awarding of extra credit in your Introduction to Psychology course. After extra credit has been awarded, your Banner ID information will be eliminated from the data file. Data used in statistical analysis will include only your responses. The data file will be kept on a password-protected university-owned computer behind a locked door and will be maintained for no more than a period of three years following project completion.at the end of the three-year period, the data will be deleted.

Following completion of surveys on the following pages, you will receive extra credit in Introduction to Psychology from Dr. Richard Beck. Participation in this study is voluntary. If you choose not to participate in this study, you may alternatively receive the same amount of extra credit by writing a 600-word essay addressing how your faith has been impacted by your time spent at ACU.

By responding to survey questions on the following pages, you acknowledge having read this information and give formal consent to participate in this study.

If you have any questions or concerns, feel free to contact any of these individuals:

Cheyenne Bullock, Researcher
281-414-9616
cab10a@acu.edu

Scott Perkins, Faculty Supervisor
325-370-4851
perkinss@acu.edu

ACU Institutional Review Board, ORSP
325-674-2885
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APPENDIX B

IRB APPROVAL

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

Dear

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled

was approved by expedited review (46.110(b)(1) category) on for a period of (IRB #). The expiration date for this study is . If you intend to continue the study beyond this date, please submit the Continuing Review Form at least 30 days, but no more than 45 days, prior to the expiration date. Upon completion of this study, please submit the Inactivation Request Form within 30 days of study completion.

If you wish to make **any** changes to this study, including but not limited to changes in study personnel, number of participants recruited, changes to the consent form or process, and/or changes in overall methodology, please complete the Study Amendment Request Form.

If any problems develop with the study, including any unanticipated events that may change the risk profile of your study or if there were any unapproved changes in your protocol, please inform the Office of Research and Sponsored Programs and the IRB promptly using the Unanticipated Events/Noncompliance Form.

I wish you well with your work.

Sincerely,

Megan Roth, Ph.D.
Director of Research and Sponsored Programs

APPENDIX C

CAFFEINE CONSUMPTION QUESTIONNAIRE (CCQ)

	Morning (6am-12noon)	**Afternoon (12noon-6pm)**	**Evening (6pm-12mid)**	**Night (12mid-6am)**
Coffee (5oz. servings)				
Regular brewed				
Percolated				
Drip-brewed				
Regular Instant				
Decaffeinated				
Brewed				
Instant				
Tea (5oz. servings)				
Cocoa (5oz. servings)				
Chocolate (8oz. servings)				
Soft Drinks (12oz. servings)				
Coca-Cola Classic, Cherry Coke, or Coke II				
Diet Coke, Diet Cherry Coke				
Caffeine-free Coke Classic, Diet Coke				
Sprite, Diet Sprite				

TAB				
Minute Maid Drinks				
Mello Yello, Diet Mello Yello				
Fresca				
Fanta Drinks (all flavors)				
Ramblin' Root Beer				
Mr. Pibb, Diet Mr. Pibb				
Dr. Pepper				
Pepsi Cola				
Diet Pepsi				
Caffeine-free Pepsi, Diet Pepsi				
Mountain Dew, Diet Mountain Dew				
Slice (all flavors)				
All Sport (all flavors)				
RC Cola				
Cherry RC				
Nehl Drinks (all flavors)				
Kick				
Diet RC				
Diet Rite (all flavors)				
Caffeine-free RC, Diet RC				
Jolt				

Over-the-Counter Drugs (tablets/wk)				
Vivarin				
NoDoz				
Excedrin				
Vanquish				
Anacin				
Dristan				
Dexatrim				

APPENDIX D

CAFFEINE EXPECTANCY QUESTIONNAIRE (CaffEQ)

1. Caffeine picks me up when I am feeling tired.
2. Conversations are better when using caffeine.
3. Caffeine helps me avoid eating more than I should.
4. I am easily stressed when having caffeine.
5. Caffeine improves my athletic performance.
6. I feel less sleepy after having caffeine.
7. Caffeine suppresses feelings of hunger.
8. I feel miserable when I do not have my usual caffeine.
9. Caffeine improves my mood.
10. I would get anxious if I abstained from caffeine.
11. Caffeine makes me jittery.
12. Workouts are better after having caffeine.
13. I would experience caffeine withdrawal if I went without caffeine.
14. I don’t like the way caffeine makes me feel.
15. I would feel sick if I went without caffeine.
16. Caffeine increases my motivation to work
17. I feel more confident after having caffeine.
18. Caffeine at any time of day throws off my sleep.
19. Caffeine makes me feel nervous.

20. Caffeine makes me feel more alert.
21. Even a small amount of caffeine makes me anxious.
22. Caffeine improves my concentration.
23. Caffeine makes me friendlier.
24. I need to have caffeine every day.
25. Caffeine makes me sweat.
26. Caffeine allows me to skip meals.
27. I have a strong desire for caffeine if I do not have my usual amount.
28. I have difficulty sleeping after having caffeine.
29. Caffeine makes me irritable.
30. I often crave caffeine.
31. Caffeine helps me work over long periods of time.
32. Caffeine makes me feel happy.
33. I would be unable to function without caffeine.
34. Caffeine makes my heart beat irregularly.
35. I would have difficulty starting my day without caffeine.
36. Caffeine upsets my stomach.
37. I would have trouble giving up caffeine.
38. Using caffeine late in the day disrupts my sleep.
39. Caffeine helps me to control my weight.
40. I would get a headache if I went without caffeine.
41. Caffeine improves my attention.
42. I feel more sociable after having caffeine.

43. I can exercise longer if I have caffeine.

44. Caffeine helps me get through the day.

45. Caffeine makes me feel more energetic.

46. Caffeine decreases my appetite.

47. Caffeine late in the day gives me insomnia.

Items Are Rated on a Scale of…

Very unlikely

Unlikely

A little unlikely

A little likely

Likely

Very likely

APPENDIX E

ZUCKERMAN SENSATION SEEKING SCALE – FORM V (SSS-V)

1. A. I like “wild” uninhibited parties
   B. I prefer quiet parties with good conversation

2. A. There are some movies I enjoy seeing a second or even a third time
   B. I can’t stand watching a movie that I’ve seen before

3. A. I often wish I could be a mountain climber
   B. I can’t understand people who risk their necks climbing mountains

4. A. I dislike all body odors
   B. I like some for the earthly body smells

5. A. I get bored seeing the same old faces
   B. I like to comfortable familiarity of everyday friends

6. A. I like to explore a strange city or section of town by myself, even if it means getting lost
   B. I prefer a guide when I am in a place I don’t know well

7. A. I dislike people who do or say things just to shock or upset others
   B. When you can predict almost everything a person will do and say he or she must be a bore

8. A. I usually don’t enjoy a movie or play where I can predict what will happen in advance
   B. I don’t mind watching a movie or a play where I can predict what will happen in advance

9. A. I have tried marijuana or would like to
   B. I would never smoke marijuana

10. A. I would not like to try any drug which might produce strange and dangerous effects on me
    B. I would like to try some of the new drugs that produce hallucinations

11. A. A sensible person avoids activities that are dangerous
    B. I sometimes like to do things that are a little frightening

12. A. I dislike “swingers” (people who are uninhibited and free about sex)
    B. I enjoy the company of real “swingers”

13. A. I find that stimulants make me uncomfortable
    B. I often like to get high (drinking liquor or smoking marijuana)

14. A. I like to try new foods that I have never tasted before
    B. I order the dishes with which I am familiar, so as to avoid disappointment and unpleasantness

15. A. I enjoy looking at home movies or travel slides
    B. Looking at someone’s home movies or travel slides bores me tremendously

16. A. I would like to take up the sport of water skiing
    B. I would not like to take up water skiing

17. A. I would like to try surf boarding
    B. I would not like to try surf boarding

18. A. I would like to take off on a trip with no preplanned or definite routes, or timetable
    B. When I go on a trip I like to plan my route and timetable fairly carefully

19. A. I prefer the “down to earth” kinds of people as friends
    B. I would like to make friends in some of the “far out” groups like artists or “punks”

20. A. I would not like to learn to fly an airplane
    B. I would like to learn to fly an airplane

21. A. I prefer the surface of the water to the depths
    B. I would like to go scuba diving

22. A. I would like to meet some persons who are homosexual (men or women)
    B. I stay away from anyone I suspect of being "gay or lesbian"

23. A. I would like to try parachute jumping
    B. I would never want to try jumping out of a plane with or without a parachute

24. A. I prefer friends who are excitingly unpredictable
    B. I prefer friends who are reliable and predictable

25. A. I am not interested in experience for its own sake
    B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal

26. A. The essence of good art is in its clarity, symmetry of form and harmony of colors
    B. I often find beauty in the "clashing" colors and irregular forms of modern paintings

27. A. I enjoy spending time in the familiar surroundings of home
    B. I get very restless if I have to stay around home for any length of time

28. A. I like to dive off the high board
    B. I don't like the feeling I get standing on the high board (or I don't go near it at all)

29. A. I like to date members of the opposite sex who are physically exciting
    B. I like to date members of the opposite sex who share my values

30. A. Heavy drinking usually ruins a party because some people get loud and boisterous
    B. Keeping the drinks full is the key to a good party

31. A. The worst social sin is to be rude
    B. The worst social sin is to be a bore

32. A. A person should have considerable sexual experience before marriage
    B. It's better if two married persons begin their sexual experience with each other

33. A. Even if I had the money I would not care to associate with flight rich persons like those in the "jet set"
    B. I could conceive of myself seeking pleasures around the world with the "jet set"

34. A. I like people who are sharp and witty even if they do sometimes insult others
    B. I dislike people who have their fun at the expense of hurting the feelings of others

35. A. There is altogether too much portrayal of sex in movies
    B. I enjoy watching many of the “sexy” scenes in movies

36. A. I feel best after taking a couple of drinks
    B. Something is wrong with people who need liquor to feel good

37. A. People should dress according to some standard of taste, neatness, and style
    B. People should dress in individual ways even if the effects are sometimes strange

38. A. Sailing long distances in small sailing crafts is foolhardy
    B. I would like to sail a long distance in a small but seaworthy sailing craft

39. A. I have no patience with dull or boring persons
    B. I find something interesting in almost every person I talk to

40. A. Skiing down a high mountain slope is a good way to end up on crutches
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope

APPENDIX F

INTERNATIONAL PERSONALITY ITEM POOL (IPIP-NEO)

1. Worry about things.
2. Make friends easily.
3. Have a vivid imagination.
4. Trust others.
5. Complete tasks successfully.
6. Get angry easily.
7. Love large parties.
8. Believe in the importance of art.
9. Would never cheat on my taxes.
10. Like order.
11. Often feel blue.
12. Take charge.
13. Experience my emotions intensely.
14. Make people feel welcome.
15. Try to follow the rules.
16. Am easily intimidated.
17. Am always busy.
18. Prefer variety to routine.
19. Am easy to satisfy.

20. Go straight for the goal.
21. Often eat too much.
22. Love excitement.
23. Like to solve complex problems.
24. Dislike being the center of attention.
25. Get chores done right away.
26. Panic easily.
27. Radiate joy.
28. Tend to vote for liberal political candidates.
29. Sympathize with the homeless.
30. Avoid mistakes.
31. Fear for the worst.
32. Warm up quickly to others.
33. Enjoy wild flights of fantasy.
34. Believe that others have good intentions.
35. Excel in what I do.
36. Get irritated easily.
37. Talk to a lot of different people at parties.
38. Like music.
39. Stick to the rules.
40. Like to tidy up.
41. Dislike myself.
42. Try to lead others.

43. Feel others' emotions.
44. Anticipate the needs of others.
45. Keep my promises.
46. Am afraid that I will do the wrong thing.
47. Am always on the go.
48. Like to visit new places.
49. Can't stand confrontations.
50. Work hard.
51. Don't know why I do some of the things I do.
52. Seek adventure.
53. Love to read challenging material.
54. Dislike talking about myself.
55. Am always prepared.
56. Become overwhelmed by events.
57. Have a lot of fun.
58. Believe that there is no absolute right or wrong.
59. Feel sympathy for those who are worse off than myself.
60. Choose my words with care.

Items Are Rated on a Scale of…

Very inaccurate

Moderately inaccurate

Neither accurate nor inaccurate

Moderately accurate

Very accurate