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Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

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Relation of reinforcement sensitivity on vocational interest and self-efficacy

by

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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Psychology (Counseling Psychology)

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2016

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ABSTRACT

Multiple theories regarding vocational choice have suggested that personality may be meaningfully related to vocational interest and vocational self-efficacy (Barrick, Mount, & Gupta, 2003; Larson and Borgen, 2006; Larson, Rottinghaus, & Borgen, 2002; Nauta, 2007), as well as the underlying mechanism (Hansen et al., 2011). One limitation in the literature of understanding the linkages between personality traits and interest and self-efficacy may be that personality traits have only been conceptualized from two dominant models, namely the Big Five (Costa & McCrae, 1992) and the Big Three (Tellegen, 2000). As discussed by Larson (2011), the use of additional models of personality may lead to greater understanding of key factors of vocational interest and self-efficacy. Using the constructs of the behavioral activation system (BAS) and behavioral inhibition system (BIS) as defined by Gray's (1990) Reinforcement Sensitivity Theory (RST) of personality, the purpose of this study was to determine if BAS and BIS related to vocational interest and self-efficacy. Data was collected online from a sample of 265 college students with an average age of 19.62 years old ($SD = 2.81$) from a large Midwestern university. Correlations between vocational interest, as measured by the Strong Interest Inventory (Donnay, Thompson, Morris, & Schaubhut, 2005), confidence, as measured by the Skills Confidence Inventory (Betz, Borgen, & Harmon, 2005), and BIS and BAS, as measured by the BIS/BAS scale (Carver & White, 1994) were calculated. BAS was found to be meaningfully correlated with both enterprising interest and confidence, as well as global liking of vocational activities. BIS was found to be negatively correlated with indifferent responses and realistic interests. Limitations, implications, and future areas of research are discussed.

CHAPTER ONE: OVERVIEW

Vocational interest and self-efficacy are widely regarded as the most significant factors that impact the process of vocational choice (Larson, 2012), as these constructs are believed to determine what occupations a person is motivated to pursue and avoid (Betz & Borgen, 2000; Lent, Brown, & Hackett, 1994; Rottinghaus, Larson, & Borgen, 2003). As these constructs are conceptualized to be motivating factors in the vocational realm, both self-efficacy and interest could be considered constructs of vocational motivation.

Despite the recognized roles of interest and self-efficacy in career choice, however, the underlying mechanism that leads to the aforementioned vocational constructs remains unclear (Hansen, Sullivan, & Luciana, 2011; Larson, 2012). Multiple theories regarding vocational choice have suggested that personality traits may be important in how people behave once their choices have been made (Larson & Borgen, 2006), and suggest that certain personality traits are related in meaningful ways to vocational interest and vocational self-efficacy (Barrick, Mount, & Gupta, 2003; Larson and Borgen, 2006; Larson, Rottinghaus, & Borgen, 2002; Nauta, 2007).

Personality is defined as a set of stable characteristics (which are often referred to as personality traits) that cause a person to think and behave in consistent ways throughout their life (Kaplan & Saccuzzo, 2005), including how they behave in activities or occupations that they have chosen. Other authors have conceptualized that personality may play a part in the development of interest and self-efficacy. For instance, Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994), suggests that personality plays a significant role in the development of vocational self-efficacy and

interests because of predisposed motivations towards some activities and away from others. Studies that have looked to establish this link have done so through the lenses of only two mainstream models of personality; the Big Five and the Big Three.

Regardless of the perspective it seems clear that studies that investigate the linkages between personality and interest and self-efficacy are important.

One limitation in the literature of understanding the linkages between personality traits and interest and self-efficacy may be that personality traits have only been conceptualized from two dominant models, namely the Big Five (Costa & McCrae, 1992) and the Big Three (Tellegen, 2000). Due to the broad and descriptive nature of the traits identified in the Big Five and Big Three, it is possible that the underlying mechanism of personality is masked by the variance within the traits themselves (Larson, 2012). For instance, when more specific traits within the Big Three were considered, greater correlations with interest and self-efficacy were identified (e.g., Larson & Borgen, 2006; Staggs, Larson, & Borgen, 2007). As discussed by Larson (2011), the use of alternative theories of personality may allow for a better understanding regarding the link between personality and vocational motivation.

In recent years, a greater focus on the neurobiology of personality has occurred. For instance, Reinforcement Sensitivity Theory (RST; Gray, 1991) has found an increasing popularity among researchers because of its theorized ability to explain the mechanisms that shape personality by investigating how approach and avoidant temperaments shape behaviors and attitudes towards a variety of experiences. Approach temperament can be defined as the system which motivates a person approach toward sources of reward (Panksepp, 1998), and is defined by Reinforcement

Sensitivity Theory as the behavioral activation system. Avoidant disposition can be defined as the system which motivates a person to avoid perceived punishing experiences or stimuli (Gray 1991). To date, only one study has investigated the relation of motivational disposition with vocational interest, which showed an individual's approach disposition has a significant relation with social and enterprising interests (Hansen et al., 2011). Hansen and colleagues defined approach disposition as including Gray's RST behavioral activation system as well as extraversion and positive emotionality (Tellegen, 2000). Hansen and colleagues (2011) also found support for their corresponding hypothesis that the avoidant disposition was unrelated to vocational interest across Holland's hexagon. Avoidant disposition was defined by them as a composite of related factors, which included Gray's RST behavioral inhibition system, neuroticism, and negative emotionality (Tellegen, 2000).

The purpose of this study is to expand on the work by Hanson and colleagues by investigating exclusively the constructs of approach and avoidant motivation that are rooted in Reinforcement Sensitivity theory. This approach allows the author to extend Hansen and colleagues' (2011) findings to validate the researchers' findings by investigating how approach and avoidance motivation defined by RST relates to vocational interest and vocational self-efficacy across Holland's hexagon.

CHAPTER TWO: LITERATURE REVIEW

The following sections will describe the constructs of vocational interest and self-efficacy, and will follow with a description of two prominent theories of personality. The relation between interest, self-efficacy, and personality will be outlined based on empirical findings. This will be followed by a description of Reinforcement Sensitivity theory (Gray, 1991), and the approach/avoidant constructs of the behavioral activation system and behavioral inhibition system. Research related to Reinforcement Sensitivity Theory with vocation will be discussed, with particular emphasis on the relation between the approach temperament and vocational interest. Finally the current study's goals and hypotheses will be described

Interest as a Construct

Modern vocational psychology primarily used John Holland's vocational interest model that describes six interest areas and is known as the Holland hexagon (Holland, 1997). These six areas are also referred to as the RIASEC, and are called realistic (R), investigative (I), artistic (A), social (S), enterprising (E), and conventional (C). Because the majority of research and descriptions of vocational interest is described through the lens of Holland's model, it is necessary to briefly describe the six areas.

Realistic (R)

Realistic interests represent activities that like to take more active and individual approach towards problems that are concrete in nature (Donnay, Morris, Schaubut, & Thompson, 2005). Activities that are high in realistic interests are often practical in nature, and often involve physical and outdoor aspects. Careers that would be considered to have high realistic interests include farming, military, and engineering.

Investigative (I)

Investigative interests represent activities that have a “strong scientific, inquiring orientation,” and have a significant mathematical and scientific orientation. Individuals that endorse high investigative interests prefer performing ambiguous or abstract approaches to critical thinking. Occupations that are high in investigative interests often include areas within the medical field, scientific research, or academia (Donnay et al., 2005).

Artistic (A)

Artistic interests represent activities that allow for self-expression, and are often reflected through a focus on aesthetic qualities in a career (Donnay et al., 2005). Individuals that endorse high artistic interests are often considered to be “free-thinkers” and are more individualistic in nature. They prefer to focus on activities that are focused on aesthetic qualities, such as visual or performing arts. Careers that are considered high in artistic interests include actors, attorneys, musicians, and graphic designers (Donnay et al., 2005).

Social (S)

Social interests represent activities that are focused on interacting with people in a helping and instructing manner. Individuals that report high social interests prefer to work in groups, and enjoy solving problems through interacting and talking with people. Occupations that are considered to have high social interests include teachers, therapists, clergy, and nurses (Donnay et al., 2005).

Enterprising (E)

Enterprising interests represent activities that are also “people” oriented, but have a greater focus on persuading, leading, and selling. Careers in politics, sales, and business management reflect high enterprising interests (Donnay et al., 2005).

Conventional (C)

Conventional interests represent activities that have a greater focus on organization and attention to detail. Individuals that endorse high conventional interests often enjoy tasks that are more concrete and procedural in nature, and are indifferent towards working with data or people overall. Occupations that are considered to have high conventional interests include accountants, office managers, and bankers. (Donnay et al, 2005)

The Measurement of Vocational Interest across the RIASEC

Several assessments have been developed to measure an individual’s level of interest according to Holland’s RIASEC model. The Self-Directed Search (SDS) and Vocational Preference Inventory (Holland, 1985) were two of the earliest examples that were modeled to provide interest profiles that reflected that individual levels for each of the six interest areas to model the inventories. Each of these vocational interest areas generated a three-letter code based on the RIASEC.

The Strong Interest Inventory has been recognized as the premiere instrument for measuring vocational interest studies across 11 versions of the Strong beginning in 1933. The most recent version is the 2005 Strong (SII; Donnay et al., 2005) and has had excellent estimates of reliability and validity (e.g., Donnay et al., 2005; Rottinghaus, et al, 2003). The SII was modeled to provide interest profiles that reflected that individual levels for each of the six interest areas of the RIASEC, and referred to each of

these vocational interest areas as General Occupational Themes (GOT's) in these measures. Focusing on the GOTs described above, the SII has shown to be a reliable instrument in identifying successful career choices through the use of assessing vocational interests (e.g., Larson, 2012; Rottinghaus et al., 2003).

The current version of the SII also includes 30 basic interest scales, which are the more specific dimensions of interest that can be organized as subsets of each of the six GOTs even though they were factorially derived (Cambell & Borgen, 1968), and developed before Holland's hexagon was applied to the Strong. There are six basic interest scales organized under the realistic, social, and enterprising GOTs. Four basic interest scales are organized under the investigative, artistic, and conventional GOTs. Although the GOTs have shown significant validity and reliability in identifying occupational group membership (Toman & Savickas, 1997), the basic interest scales provide increased precision to predict academic major and eventual career choice more accurately (e.g., Gasser, Larson, & Borgen, 2007;).

Interest across the RIASEC in Career Choice

In vocational psychology, the importance of interest is integral to the pursuit and development of a career for an individual (Betz & Borgen, 2000; Borgen, 1999). The most researched vocational construct, interest is considered to be a stable disposition towards pursuing some activities and avoiding others (Larson, 2012; Low & Rounds, 2006) and is a significant predictor of successful career choice (Donnay et al., 2005). For example, in a discriminant analysis of 1,105 employed men and women, it was found that interests across the RIASEC alone could explain 79% of the variance in a successful career choice (Donnay & Borgen, 1999).

Self-Efficacy as a Construct

In vocational psychology, the increasing recognition of self-efficacy's role in career development is helpful in the pursuit and development of an individual's career choice (Betz & Borgen, 2000; Borgen, 1999). Self-efficacy is defined as an individual's "judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). The six areas measured in self-efficacy parallel those used to measure interest, and focus on one's perceived ability to complete tasks in a given area.

The Measurement of Self-efficacy across the RIASEC

The Skills Confidence Inventory (SCI; Betz, Borgen, & Harmon, 1995; 2005), was developed to assess self-efficacy or confidence in the six GCTs. In regards to vocational self-efficacy, these areas are called General Confidence Themes (GCTs) in the SCI, and are found to mirror the GOTs in relation to their anchors in Holland's RIASEC model.

The GCT scales from the SCI moderately correlate with the respective GOTs from the SII in both a sample of 250 college women, with correlations ranging from .61 to .77 across the RIASEC (Betz et al., 2005). In a sample of 81 college men, a similar range of correlations across the RIASEC were found, with correlations ranging from .52 to .84 (Betz et al., 2005). These correlations with the GOTs further support acceptable concurrent validity of the measure, as both of these measurements are commonly used together to assist with identifying successful occupation membership in career counseling (Betz, 2007; Betz et al., 2005; Lent et al., 1994).

Another measurement of vocational-self efficacy is the Expanded Skills Confidence Inventory (ESCI; Betz, Borgen, & Harmon, 2002), which was developed to provide basic confidence scales that mirror the basic interest scales from the SII. The utility of the basic confidence scales in providing greater predictive power than the GCTs is similar to the increase of power found through use of the basic interest scale compared to the GOTs.

Although some debate exists regarding if self-efficacy and interest are separate or two aspects of a high-order construct (Armstrong & Vogel, 2009), the use of both self-efficacy and interest measures to determine career choice is widely accepted among vocational psychologists (Betz, 2007).

Self-efficacy has also been recognized as a significant predictor of successful career choice (Donnay et al., 2005). For example, in a discriminant analysis of 1,105 employed men and women, it was found that interests across the RIASEC alone could explain 82% of the variance in a successful career choice (Donnay & Borgen, 1999). Betz, Borgen, and Harmon (2006) also found that nearly 80% of the variance in regards to occupational choice was explained by self-efficacy across the RIASEC when measured alone ($N=1,103$).

Interest and Self-Efficacy

There is little question about the recognized importance of vocational interests; researchers, however, have also identified significant impact of self-efficacy within career choice as well. In meta-analyses of the relation between interest and self-efficacy (Rottinghaus et al., 2003), statistically strong relations of self-efficacy and interest were found across the RIASEC (r s ranged from .50 - .63; $k = 53$). The discriminant analyses

by Donnay and Borgen (1999) also supported these results, which also showed the combined power of interest and self-efficacy in making a successful career choice could explain 90% of the variance in said choice when measured across the GOTs and GCTs of the RIASEC. These studies reveal a consistent finding about the statistically strong predictive power of self-efficacy and interest when used separately of each other. When used together, however, the combined ability of self-efficacy and interest were even stronger predictors for career choice.

As mentioned above, there is debate regarding these findings, with some suggesting that the strong correlation between interest and self-efficacy may be due to the fact that they are both aspects of a higher-order construct (Armstrong & Vogel, 2009). Regardless, many researchers still perceive them as separate (e.g., Larson, 2012; Lent, Sheu, & Brown, 2010) and for the purposes of this investigation they will be considered as two distinct constructs.

The research clearly demonstrates the importance of vocational interest and self-efficacy when discussing vocational choice, as they provide essential information for identifying which occupations a person will be directed to pursue and avoid. Furthermore, though interest and self-efficacy are powerful predictors of career choice when used alone, they become more powerful when used together. How these constructs are developed, however, remains unclear. When considering the underlying process through which these constructs are developed, an individual's personality has been hypothesized to play a role.

Development of Vocational Interests and Self-Efficacy: Social Cognitive Career Theory

Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994) is one of the primary examples of a vocational theory that considers the importance of both self-efficacy and interest in vocational choice. Based on Bandura's Social Cognitive Theory (1986), Lent, Brown, and Hackett stated that the environment, society, personal cognitions and affective states all had reciprocal effects on each other, which would impact how much confidence the individual has in successfully completing a given activity. High or low self-efficacy in the activity would then influence interest development in a respective manner, and would serve as a mediator to choice goals (i.e. career aspiration, educational aspirations, etc.). Due to several studies that appeared to show a reciprocal relationships between interest and self-efficacy (e.g., Tracy, 2002; Borgen & Donnay, 1999), many SCCT-based researchers have conceded to this reciprocal relationship (Larson, 2012).

Personality Models

As with many psychological questions, a person's development is likely an interaction between life experiences and predisposed tendencies regarding how one is likely to respond to those experiences. One of these predispositions is personality. When considering the role of personality in the development of on interests and self-efficacy across the RIASEC, personality has be conceptualized as an antecedent of career outcome (Larson, 2012).

There have only been two models that have been used to investigate the intersection between vocational motivation and personality; the Big Five (McCrae &

Costa, 1992) and the Big Three (Tellegen, 2000). In the current study, vocational motivation is defined as vocational interest and vocational self-efficacy or confidence. Researchers have found small to moderate relations of these personality traits (across the Big Five and the Big Three) with interest and self-efficacy (across the RIASEC) (e.g., Barrick et al., 2003; Harmon & Betz, 2007; Larson, Wei, Wu, Borgen, & Bailey, 2007; Larson et al., 2002). These findings suggest that some personality traits may be related to what vocations an individual is motivated to pursue or avoid or how one performs in a particular occupation.

The Big Five

The Big Five personality theory is among the most utilized and researched personality theories within modern psychology (Sherry, Henson, & Lewis, 2003). This model represents a broad structure of personality traits (Digman, 1997), and provides a useful categorization of overarching dimensions that subsume the individual differences between people (Digman, 1990). The five domains include neuroticism, extraversion, openness, agreeableness, and conscientiousness.

To better understand these domains and how they relate to the constructs of vocational interest and self-efficacy, brief descriptions of each domain will be provided in the proceeding section. After the description, relevant relationships with interest and self-efficacy will be discussed.

Neuroticism

Neuroticism is considered to be the broad domain of negative affect (Costa, Terracciano, & McCrae, 2001), and is conceptualized as emotional instability (Costa & McCrae, 1992). Individuals high in neuroticism are considered to be anxious and

insecure, as opposed to someone who is seen as calm- and self-confident (Kaplan & Saccuzzo, 2005).

Extraversion

Extraversion is considered to be the broad domain of interpersonal interaction (Costa et al., 2001), and focuses on an individual's sociability, interaction style, and their level of social activity (Costa & McCrae, 1992). Individuals that report high scores in the extraversion domain are likely to be seen as more talkative, leader-like, and assertive as opposed to being withdrawn, quiet, and reserved (Kaplan & Saccuzzo, 2005).

Openness

Openness refers to openness to experience, and is considered to be the broad domain that encompasses intellectual curiosity and imagination, and are more sensitive to aesthetic aspects in their life (Costa & McCrae, 1992). Individuals that are high in the openness domain are considered to be more open-minded and imaginative in how they think, as opposed to having a concrete and narrow mindset (Kaplan & Saccuzzo, 2005).

Agreeableness

Agreeableness is considered to be the domain that encompasses an individual's disposition towards helping and caring for others, and are defined through altruistic intentions and sympathy towards others (Costa & McCrae, 1992). Individuals who endorse high scores in the agreeableness domain are considered to be warm and cooperative as opposed to being unpleasant and disagreeable (Kaplan & Saccuzzo, 2005).

Conscientiousness

Conscientiousness is the broad domain of determination, purposefulness, and drive (Costa & McCrae, 1992). Individuals that are high in the conscientiousness domain are considered to be persevering, responsible, and organized, as opposed to lazy, irresponsible, and impulsive (Kaplan & Saccuo, 2005).

Measurement of the Big Five

The Big Five have been measured in a variety of ways. The more predominant measures include the NEO-Five Factor Inventory (FFI; Costa & McCrae, 1992), the NEO-PI (Costa & McCrae, 1992), and the NEO PI-R (Costa & McCrae, 1998). Although all of these measures have shown adequate psychometrics, the NEO-PI and NEO-PI-R are most often used to assess and define the Big Five personality dimensions.

The International Personality Item Pool (IPIP; Goldberg, 1999), which is a non-proprietary set of 3, 320 items has also been used to develop multiple Big Five personality inventories. Several of these inventories were developed to be non-proprietary inventories that mimic selected proprietary inventories, including the NEO-PI-R (Costa & McCrae, 1992). The IPIP NEO-PI-R scale (Goldberg, 1999) has been found to be related adequately to the original NEO-PI-R scales, and has even been found to more accurately relate to the proposed constructs of the NEO-PI-R in some circumstances compared to the constructs of the original NEO-PI-R (Goldberg et al., 2006).

The Big Five Personality and Vocational Interests

The research in this area has been extensive enough to warrant two meta-analyses in which their results were very similar (i.e., Barrick et al., 2003; Larson et al.,

2002). In a 2002 meta-analysis by Larson and colleagues ($k = 12$; $N = 2, 571$), the researchers investigated relationship between the Big Five personality traits and the RIASEC vocational interests. Of the 30 possible personality-interest combinations, only five combinations were found to be meaningfully significant for both men and women regardless of the vocational interest measure used. The personality trait of extraversion was found to relate to both social interests ($r = .31$) and enterprising interests ($r = .41$). Both artistic and investigative interests were found to have a correlation with openness ($r = .48$ and $r = .28$, respectively). The social interest was found to have a small correlation to agreeableness ($r = .19$).

These results are supported by a different and independent meta-analysis done by Barrick and colleagues a year later (2003). Extraversion showed to have a small correlation with social interest at $r = .29$, and a moderate correlation with enterprising interest at $r = .41$ ($k = 39$, $N = 10, 382$). Openness was shown to moderately correlate with artistic interests at $r = .39$, and revealed a small correlation with investigative interests ($k = 39$, $N = 10, 382$). A significant correlation between agreeableness and social interests was also found, revealing an $r = .15$ ($k = 37$, $N = 10, 879$). Finally, conscientiousness and conventional interests were found to be significantly related at $r = .19$ ($k = 36$, $N = 10, 685$). It can be seen that these results reflect the findings of the 2002 meta-analysis by Larson and colleagues, suggesting that the significant relations between the above personality-interest pairs can be expected in studies that relate the Big Five personality domains with vocational interests across the RIASEC.

Big Five Personality and Vocational Self-Efficacy

Five studies were located that examined the relation between the Big Five and self-efficacy across confidence, as measured by the SCI (Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2007; Nauta, 2004; Nauta, 2007; Rottinghaus, Lindley, Green, & Borgen, 2001). Samples were obtained from college student populations in each of the studies, and correlations between each of the Big Five personality domains and the confidence were calculated.

The findings were generally consistent across the studies. Small to moderate correlations were found between the personality-confidence pairs of extraversion-social confidence (.31 to .41), extraversion-enterprising confidence (.42 to .57), openness-investigative confidence (.24 to .36), openness-artistic confidence (.41 to .48), openness-social confidence (.17 to .34), and agreeableness-social confidence (.20 to .40).

At least three of the five studies provided empirical evidence of additional relations between the Big Five and RIASEC confidence. Neuroticism was shown to have a significant relation with realistic confidence (-.32 to -.24; Harmon & Betz, 2007; Nauta, 2004; Nauta, 2007), investigative confidence (-.24 to -.29; Harmon & Betz, 2007; Nauta, 2004; Larson et al., 2007), enterprising confidence (.24 to .38; Harmon & Betz, 2007; Nauta, 2004; Rottinghaus, 2001), and conventional confidence (.23 to .36; Harmon & Betz, 2007; Larson et al., 2007; Nauta, 2004). Openness and enterprising confidence were also found to have a moderate relation (.44 to .45; Nauta, 2004; Nauta, 2007; Rottinghaus et al., 2001) in a majority of the studies, as well as the personality-

confidence pair of conscientiousness-conventional confidence (.27 to .31; Larson et al., 2007; Nauta, 2007; Rottinghaus et al., 2001).

Consistent Relations of Interest and Confidence to Big Five Personality

Providing further support in regards to the relations between self-efficacy and interest across the RIASEC, the significant linkages of personality-interests are parallel to the significant linkages of personality-confidence pairs. Openness was significantly related to both investigative interest and confidence, as well as artistic interest and confidence. Extraversion was meaningfully related to both social interest and confidence, as well as enterprising interest and confidence. Agreeableness was related with both social interest and confidence, and conscientiousness was meaningfully related to conventional interest and confidence.

Several personality dimensions were meaningfully related to vocational confidence, but not with vocational interest. Neuroticism was related to the realistic, investigative, enterprising, and conventional confidence. Extraversion was related to artistic confidence, and openness was related to social and enterprising confidence. Conscientiousness was related to conventional confidence as well. This suggests that although there are similar linkages between personality and the interest/confidence areas, differences do exist.

There were also several nominal relations of personality with both interest and self-efficacy. These included neuroticism-artistic, extraversion-realistic, extraversion-investigative, extraversion-conventional, openness-conventional, agreeableness-realistic, agreeableness-investigative, agreeableness-artistic, agreeableness-enterprising, agreeableness-conventional, conscientiousness-realistic, and

conscientiousness-artistic. Similar to the pattern with personality/ interest correlations that were trivial, the Big 5 were not linking to interests that were away from the “people” end of Prediger’s (1976) people/things dimension.

These findings suggest that specific personality traits do, in fact, relate to the self-efficacy and interest a person endorses in respect to vocation. Several studies have also investigated if and how an alternative model of personality, called the Big Three (Tellegen, 2000) relates to interest and self-efficacy.

Big Three

Much like the Big Five, Tellegen’s (2000) Big Three also suggests that there exists higher-order constructs that can be used to describe non-pathological personality. These constructs include Positive Emotionality, Negative Emotionality, and Constraint. Compared to the Big Five, however, Tellegen suggests that these higher-order constructs are made up of 11 personality traits called primary scales that are more specific than the traits outlined by the Big Five.

To better understand the relation between the Big Three higher-order constructs and respective primary scales with interests and self-efficacy, the following sections will discuss these findings with relation to the higher-order construct first, and will follow with a discussion regarding the relevant primary scales that are encompassed by the given higher-order construct. Following the descriptions, relevant relations with vocational interest and self-efficacy domains will be discussed. Due to a lack of significant findings relating interest or self-efficacy with the primary scales of stress-reaction, alienation, and control, these primary scales will not be included in this review.

Positive Emotionality

Positive emotionality (PEM) is one of three higher-order constructs that exist within the Big Three (Tellegen, 1982), and describes an individual's disposition towards positive emotional temperament in regards to personal agency and interpersonal interactions. PEM is complimentary to the other emotional temperament higher-order factor of negative emotionality (NEM; Staggs, Larson, & Borgen, 2007), and is subsumed by four primary scales; social potency, achievement, wellbeing, and social closeness. To best understand what PEM encapsulates, it is important to understand each of the primary scales that underlie PEM. Their descriptions are as follows.

Social potency, one of the primary scales underlying PEM, deals primarily with the influencing, motivating, and leading of people (Tellegen & Waller, 2008). An individual that scores highly in social potency is often considered to be forceful and decisive, fond of influencing others, and enjoys leadership roles (Tellegen, 1982). In relation to the Big Five, the primary scale of social potency has been identified as one of two anchors to extraversion, allowing for meaningful comparisons of constructs between the Big Five and Big Three.

Another primary scale encompassed by PEM is social closeness. Social closeness is the primary scale that describes how a person relates to others (Tellegen & Waller, 2008). Someone that scores high in the social closeness scale would be seen as a warm and friendly person that likes people, and will turn to others for comfort (Tellegen, 1982). In relation to the Big Five, the primary scale of social closeness has been identified as one of two anchors to extraversion.

Achievement is another of the primary scales encompassed by PEM, describing the individual's disposition to work hard in order to accomplish their goals (Tellegen & Waller, 2008). An individual that scores high in the achievement primary scale is considered to be a hard worker, and enjoys projects that are challenging and demanding in their nature (Tellegen, 1982).

The final relevant primary scale encompassed by PEM is Wellbeing, another primary scale underlying the PEM, describes an individual's positive attitude towards themselves and their life (Tellegen & Waller, 2008). Individuals that score highly in this primary scale are described as someone that feels positive about themselves and their future, and are seen as having a happy, cheerful disposition (Tellegen, 1982).

Negative Emotionality

Negative emotionality (NEM) is one of three higher-order constructs that exist within the Big Three (Tellegen, 1982), and describes an individual's disposition towards negative emotional temperament in regards to personal agency and interpersonal interactions. NEM is subsumed by three primary scales; aggression, stress reaction, and alienation. For the purposes of this review, aggression will be the only primary scale underlying NEM described, as it is the only relevant primary scale underlying NEM in which a significant relationship to vocational motivation is identified.

Aggression is considered to describe a person's willingness to use intimidation and force in relationships (Tellegen & Waller, 2008). Individuals that score high on the aggression primary scale will hurt others in order to gain an advantage, and actively tries to make others feel discomfort (Tellegen, 1982). Aggression has also been

identified as an anchor to the Big Five domain of agreeableness, although the relationship is inverse.

Constraint

Constraint (CON), the last of the higher-order factors in the Big Three, describes an individual's behavioral constrain parameter (Staggs et al., 2007). In other words, CON relates to the dispositions that influence a person to act or restrain themselves. Although it is subsumed by the three primary scales of harmavoidance, traditionalism, and control, only harmavoidance and traditionalism have been found to relate to the vocational motivation constructs discussed above. Therefore, only harmavoidance and traditionalism will be described.

Harmavoidance is one of two relevant primary scales encompassed by the higher-order construct of CON, and deals with a person's avoidance of dangerous and aversive situations (Tellegen & Waller, 2008). An individual high in harmavoidance is considered to have a cautious approach to activities, and would prefer safe and tedious activities compared to exciting and dangerous activities (Tellegen, 1982).

Traditionalism is also a relevant primary scale encompassed by CON, and involves the desire to adhere to conservative and traditional values in life (Tellegen & Waller, 2008). High-scorers in this primary scale will seek a conservative social environment and will often have high moral standards for themselves and those around them (Tellegen, 1982).

Absorption

Absorption is a unique primary scale, as it draws aspects from both PEM and NEM, and is therefore set aside as its own construct (Larson, Wu, Bailey, & Glasser,

2010; Tellegen & Waller, 2008). This primary scale deals with an individual's disposition to become immersed in fantasy, and describes the way a person perceives and interacts their environment (Tellegen & Waller, 2008). An individual that scores highly in the absorption scale is seen as more responsive to evocative stimuli surrounding them, and will become readily enamored with enticing stimuli (Tellegen, 1982). In relation to the Big Five, the primary scale of absorption has been identified as the anchor to openness, which allows for comparison between personality models.

Big Three Personality and Vocational Interests

Staggs and colleagues (2007) used meta-analyses ($k = 5$; $N = 2023$) to identify how the RIASEC interests were related to the three overarching constructs, as well as the 11 primary scales. All four of the PEM primary scales related meaningfully to interests across the RIASEC. The social potency factor was found to moderately relate to enterprising interests at ($r = .36$). Small correlations between the social closeness primary scale and both the social and enterprising interests were identified ($r = .29$ and $r = .20$, respectively). The wellbeing primary scale had a small correlation with the social interest ($r = .26$). The achievement primary scale correlated $.27$ with the investigative interest.

Only one of the three NEM primary scales correlated meaningfully with interests across the RIASEC. Aggression was inversely related to social interest ($r = -.22$). Two of the Constraint factors correlated meaningfully with interests across the RIASEC. Harmavoidance was correlated $-.31$ with realistic interest and traditionalism was correlated $.22$ with social interest. Finally, the primary scale of absorption was moderately related to artistic interest ($r = .44$).

Big Three Personality and Vocational Self-Efficacy

Only one article was located that examined the relation of the Big Three with vocational self-efficacy across the RIASEC. Larson and Borgen (2006) investigated the relation of Tellegen's Big Three higher-order personality factors and 11 primary scales to the six domains of self-efficacy. Using four samples of undergraduate students ($N = 1,173$) enrolled in introductory psychology courses at a large Midwestern University, the researchers were able to identify significant relations of confidence with both the higher-order factors and specific primary scales.

PEM was the only higher-order construct that was related to the overall mean level of confidence reported across the GCT's (r s ranged from .41 to .48 across samples) or specific confidence domains. Small correlations between PEM and both realistic confidence (r s ranged from .20 to .32) and investigative confidence (r s ranged from .23 to .30) were identified. PEM was moderately correlated with artistic confidence (r s ranged from .29 to .35), social confidence (r s ranged from .36 to .43), and enterprising confidence (r s ranged from .43 to .52). PEM was one of the markers of the approach temperament by Hansen and colleagues (2011) which suggests that vocational self-efficacy across the RIASEC may relate to the approach temperament defined by RST.

Significant relations between the six GCTs with each of the four primary scales encompassed by PEM were identified. Social potency showed a moderate correlation with overall confidence (r s ranged from .41 to .48), and was moderately correlated with social confidence (r s ranged from .29 to .38) and enterprising confidence (r s ranged from .58 to .66). Social potency was also found to have a small correlation with artistic

confidence (r s ranged from .24 to .30). Social closeness and social confidence were significantly correlated (r s ranged from .19 to .28). Achievement was moderately related to overall level of confidence (r s ranged from .29 to .35) across the RIASEC, with small to moderate correlations being identified for the investigative (r s ranged from .27 to .34) and enterprising (r s ranged from .19 to .30) GCTs. Wellbeing showed small relation to both social confidence (r s ranged from .25 to .33) and enterprising confidence (r s ranged from .41 to .48) domains.

The absorption primary scale moderately related with artistic confidence (r s ranged from .40 to .44). The only CON subscale that was significantly related to confidence was harmavoidance, which was significantly related to realistic confidence (r s ranged from -.27 to -.47).

Consistent Relations of Interest and Confidence to Big Three Personality

Providing further support in regards to the relations between self-efficacy and interest across the RIASEC, there were several similarities when considering the significant Big Three personality-interest and personality-confidence combinations. For instance, social potency was related to interest and self-efficacy in the enterprising area, and social closeness was related to both interest and self-efficacy in the social area. Achievement was meaningfully related to both investigative interest and confidence, and wellbeing was meaningfully related to confidence and interest in the social area. Harmavoidance showed a significant inverse correlation with realistic interest and confidence. Absorption was meaningfully related to artistic interest and confidence as well.

As with the Big Five, the Big Three has been useful in providing support for personality's relation to interest and confidence across the RIASEC. Even more, several primary scales have yielded higher levels of correlation when compared to the Big Five traits or the higher-order factors of the Big Three. For example, PEM and enterprising interest were found to have a small level of correlation, as compared to the moderate relation between the social potency primary scale and enterprising interest. Moreover, identifying specific linkages are helpful in mapping the relation between personality and vocational interest and self-efficacy, researchers need to move beyond plotting the linkages to look for the underlying mechanisms at work when one approaches or avoids particular vocational choices like educational majors or occupations.

One theory has identified neurobiological structures responsible for approach and avoidant behaviors. Although several models have outlined versions of the approach/avoidant personality constructs, the present study will explain these constructs through use of Gray's (1991) Reinforcement Sensitivity Theory (RST) because RST was the first theory to identify neurobiological structures for approach and avoidant behaviors. Although a number of different names might be given to the approach system (i.e. sensitivity to reward) and the avoidance system (i.e. sensitivity to punishment), the author will discuss these systems through the lexicon associated with RST. The two constructs are called the behavioral activation system synonymous with sensitivity to reward and the behavioral inhibition system synonymous with sensitivity to punishment, and are unique in explaining how interests and self-efficacy are developed in regards to an individual's response to rewarding and aversive stimuli. In order to understand why this theory is unique, a brief description of Reinforcement Sensitivity

Theory will be presented. Following this, the constructs of the behavioral inhibition system and the behavioral activation system will also be discussed, including how each construct relates to the Big Five and Big Three personality traits.

Reinforcement Sensitivity Theory

Reinforcement Sensitivity Theory (RST) is a novel view of personality, as it is one of the first to incorporate biological underpinnings and an individual's subjective mood state to explain how behavior and motivation manifests in an individual's everyday life (Gray, 1991; van der Linden, Beckers, & Tarris, 2007). Simply put, RST explains how and why individuals react to punishing and rewarding stimuli in their life (Corr, 2004). Although RST has been present in the literature since it was first developed in 1970, increased understanding of neurobiology has allowed for an increase in research using this theory in recent years (van der Linden et al., 2007).

In the original conception of the theory, Gray (1970; 1991) described two main constructs were responsible for explaining individual differences of how a person reacts to the environment; the behavioral activation system and the behavioral inhibition system. The following sections will describe these systems, how they manifest in observable ways, and their relation to other well-established personality constructs.

When considering the literature, the terms "sensitivity to reward" and "sensitivity to punishment" are often used interchangeably with the behavioral activation system and behavioral inhibition system, respectively" (e.g. Corr, 2004; Gable, Reis, & Elliot, 2000; van der Linden, Beckers, and Kindt, 2007; van der Linden et al., 2007;). For the purposes of the current review, the terms of behavioral activation system and sensitivity

to reward will be used interchangeably, as will behavioral inhibition system and sensitivity to punishment.

It is worth mentioning that in the most recent revision of RST, Gray and McNaughton (2000) describe a third system called the fight-flight-freeze system (FFFS). However, the FFFS has not been conceptualized as relating to interest or self-efficacy. Therefore, it will not be discussed at this time.

Behavioral Activation System

The behavioral activation system has been described as the reward sensitivity portion of RST (Gray, 1991; van der Linden et al., 2007), and is presumed to be the neurobiological system that is responsible for motivating an individual to engage in rewarding activities and stimuli. Although the neurobiological aspects of the behavioral activation system is not described as specifically as the behavioral inhibition system, increasing research on the structures that house the behavioral activation system has shown links to structures that are also shown to relate to extraversion and positive incentive motivation (Read, Monroe, Brownstein, Yang, Chopra, & Miller, 2010). These structures, which have been generally identified as the dopaminergic reward system, include the ventral tegmentum, ventral pallidum, and nucleus accumbens, and are connected by dopaminergic pathways. (Depue & Collins, 1999; Depue, Luciana, Arbisi, Collins, & Leon, 1994; Gray, 1991 Read et al., 2010).

Research has shown that individuals with high scores versus low scores measuring the behavioral activation system were more sensitive to positive stimuli, and put more effort, both sustained and short-term, into activities where rewards are present (Corr, 2004; Elliot & Thrash, 2002; Jackson, 2001) and were related to positive mood

states such as happiness and hope (Gray 1991; Smillie & Jackson, 2005; van der Linden et al., 2007;). Anger has also been found to relate to activation of the behavioral activation system (Carver, 2004), as both anger and the aforementioned positive mood states create increased energy and determination in achieving a subjectively rewarding goal. Several studies have also found links between activation and bulimia nervosa (e.g., Claes, Nederkoorn, Vanderevcken, Guerrieri, & Vertommen, 2006; Harrison, O'Brien, Lopez, & Treasure, 2010), addiction (Kambouropoulos & Staiger, 2001; MacLaren, Fugelsang, Harrigan, & Dixon, 2011), and the hyperactive/impulsive subtype of ADHD (Gomez & Carr, 2010). Several studies (e.g., Bijttebier, Beck, Claes, & Vandereycken, 2009; Mitchell & Nelson Gray, 2006) have also shown identify hyperactive/impulsive type ADHD through the use of the Behavioral Activation System (BAS) measured by the Behavioral Inhibition System/Behavioral Activation System (BIS/BAS; Scale Carver & White, 1994).

In regards to the behavioral activation system's relation to personality constructs described in other theories (i.e. Big Five), Elliot and Thrash (2002) found that both extraversion and the behavioral activation system loaded on a single factor, called approach temperament, using a confirmatory factor analysis. In a more recent study of employed individuals in the Netherlands ($n=105$), van der Linden and colleagues (2007) reported a moderate correlation ($r = .30$) between extraversion and the behavioral activation system. This is consistent with Gray and McNaughton's (2000) proposed relation between the behavioral activation system and the sociability and impulsivity aspects of extraversion in regards to both personality and neurobiology.

The related higher order factor of PEM (Tellegen, 2000), within the Big Three, also appears to relate significantly to the behavioral activation system. For instance, Hansen and colleagues (2011) showed that both the behavioral activation system and PEM in a confirmatory factor analysis loaded on the latent factor called approach motivation (factor loadings of .53 and .83, respectively). This suggests that both the behavioral activation system and PEM are not only related to the construct of approach motivation as described by the researchers, but have a moderate relation to each other as well. These findings are consistent with the brain structures are recognized as integral parts of the Big Five's construct of extraversion, the Big Three's PEM, and RST's behavioral activation system (Read et al., 2010).

Behavioral Inhibition System

The behavioral inhibition system has been described as the punishment sensitivity portion of RST (Gray, 1991; van der Linden et al., 2007), and is presumed to be the neurobiological system that is responsible for motivating an individual to avoid or prevent activities and stimuli that the person interprets as punishing. The neurobiological aspects of the BIS is recognized as being related to the anxiety systems of the brain, including the septo-hippocampal system and amygdala (Smillie, 2008; van der Linden et al., 2007; McNaughton & Corr, 2004; Gray and McNaughton, 2000). These structures have been thought to be impacted by the release of serotonin and noradrenaline, and are released when presented with a negative stimulus (Smillie, 2008). As these structures are exposed to serotonin and noradrenaline, increased reactivity over time increases an individual's trait anxiety (Smillie, 2008). Researchers describing other personality constructs, such as neuroticism (Costa & McCrae, 1992)

and NEM (Tellegen, 1985), have also conceptualized this approach-avoidance aspect by recognizing these same neurobiological structures.

Research has shown that individuals high in behavioral inhibition system activation will show greater response to potentially threatening stimuli or situations that are likely to have negative outcomes, such as interpersonal conflict (van der Linden et al., 2007; Gable et al., 2000). The response might include immediate avoidance from the stimuli or activity in terms of withdrawal, as well as develop a more cautious approach towards situations where future negative outcomes are expected (Gray, 1991). Multiple studies have shown that individuals with high sensitivity to punishment are less likely to respond to rewards compared to those low in the behavioral inhibition system (McNaughton & Corr, 2004), and display greater effort in order to avoid situations that may result in interpersonal conflict, material loss, or social disapproval (Gray; 1991; Elliot & Thrash, 2002)

Originally discussed by Gray (1991) and validated by numerous studies in the literature (e.g., Corr, 2004; Elliot & Thrash, 2002;), individuals who are high in the behavioral inhibition system report more frequent negative mood states throughout their daily life (Gable et al., 2000), which include anxiety, rumination, and worry. Stress and high BIS activity have also been shown to be moderately related ($r = .48$; van der Linden et al., 2007), and have even been linked to being more likely to interpret situations as stressful (Gable et al. 2000). These findings are supported by increased likelihood of being diagnosed with a major depressive disorder and anxiety disorder (Poythress et al., 2008), or anorexia nervosa (Claes et al, 2006; Harrison, et al., 2010). Gomez and Corr (2010) also found that individual with high sensitivity to punishment

were more likely to endorse symptoms consistent with the inattentive subtype of ADHD, which has also been found to be a potent predictor of subjective negative mood states, psychopathologies, and generally low life satisfaction (e.g. Barkley, 2001).

In regards to the behavioral inhibition system's relation to personality constructs described in other theories (i.e. Big Five), sensitivity to punishment and neuroticism were found to have a strong correlation, with r s ranging from .64 to .72 (Boeck, 2006; Jorm et al., 1998). Elliot and Thrash (2001) supported these findings through a confirmatory factor analysis that revealed both neuroticism and the BIS loaded on a single factor they called avoidance temperament. These findings were more recently validated through van der Linden and colleagues' study of during a employed adults in the Netherlands ($n = 105$), van der Linden and colleagues (2007) reported a strong correlation ($r = .72$) between neuroticism and the behavioral inhibition system's activation. Furthermore, the researchers also found a moderate inverse correlation between the behavioral inhibition system activation and extraversion ($r = -.40$).

The related higher order factor of NEM (Tellegen, 2000), as described within the Big Three, also appears to relate significantly to the behavioral inhibition system. For instance, Hansen and colleagues (2011) showed that both the BIS and NEM in a confirmatory factor analysis loaded on the latent factor they called avoidance motivation (factor loadings of .55 and .49, respectively). This suggests that both the behavioral inhibition system and NEM are not only related to the construct of avoidant motivation as described by the researchers, but have a moderate relation to each other as well.

RST and Research

As outlined above, multiple studies have used RST to explain individual differences regarding psychopathologies (e.g., Poythress et al., 2008), developmental and learning disorders (Gomez & Corr, 2010), addictions (e.g., Kambouropoulos & Staiger, 2001; MacLaren et al., 2011), and even right or left handedness (e.g., Wright, Hardie, & Wilson, 2009). Increased understanding of brain structures and functions in recent years have helped to spur on these studies, as RST holds a unique position to link brain structures with various personality characteristics.

Although no universally standard measure exists at this time, a review of the literature reveals that the BIS/BAS Scale (Carver & White, 1994) has been the most widely used and respected measure to date (van der Linden et al., 2007). This self-report measure is one of many in the literature that is meant to address the specific constructs that the researcher wished to investigate; specifically activation of the BIS and BAS in an individual. These two scales have allowed researchers to investigate RST constructs both in laboratory and real-world settings.

RST and Vocational Constructs

Despite the recent increase of studies related to RST over the last decade, only a handful of studies that investigated the intersection between RST and the world of work (Gable et al., 2000; Hansen et al., 2011; Jackson, 2001; van der Linden et al., 2007). Of these studies, all but one were focused on career outcomes (i.e. work stress, job performance). For instance, several studies found that individuals who have a high sensitivity to reward gave more effort to an occupational task when provided with monetary incentive (e.g. Gable et al., 2000; Jackson, 2001). Another study found that

levels of work stress was correlated with the behavioral inhibition system (van der Linden et al., 2007), but was not correlated with the behavioral activation system (van der Linden et al., 2007). These findings, suggest that both the behavioral inhibition system and behavioral activation system influence an individual after they have made an occupational choice.

In other words, both the behavioral inhibition system and behavioral activation system appear to influence motivation for activities present within the individual's chosen career. As discussed by Larson and Borgen (2006), the predisposed tendencies of personality is thought to influence an individual pre and post occupational choice. This is consistent with the belief that personality generally influences approach or avoidance of occupational activities or situations (Larson & Borgen, 2006), with pre-choice behaviors having significant interaction with vocational interest and self-efficacy. Therefore, the findings related to RST and vocational outcomes provide further validation for using behavioral inhibition system and behavioral activation system as an alternative personality construct for better understanding the development of vocational interest and self-efficacy.

To date, only one study (Hansen et al., 2011) has specifically investigated the relation between vocational interest with the behavioral inhibition system and behavioral activation system. As described above, sensitivity to reward and punishment are thought and found to influence an individual's approach or avoidance of stimuli. Hansen and colleagues conceptualized vocational interests, based on the Holland's RIASEC model (1997), as stimuli that activate the neurological approach or avoidance systems. The researchers outlined previous neurobiological research that suggested stimuli

related to interpersonal engagement activated the neurobiological pathways that are thought to make up the BAS (Depue & Collins, 1999), allowing them to suggest that vocational interests that are high in sociability (social and enterprising; Hogan, 1983) would have significant relation with activation of the behavioral activation system.

To test this hypothesis, 259 undergraduate students were asked to complete several measures operationalizing the approach temperament and the avoidant temperament, which included the NEO PI-R; Costa & McCrae, 1992, the Multidimensional Personality Questionnaire-Brief Form (MPQ-BF; Patrick, Curtin, & Tellegen, 2002), and the BIS/BAS Scale (Carver & White, 1994). The results of the confirmatory factor analysis supported previous findings that PEM (.83), extraversion (.67), and the behavioral activation system (.53) significantly loaded under the latent factor labeled approach temperament, whereas NEM (.55), neuroticism (.90), and the behavioral inhibition system (.49) loaded under the latent factor called avoidance temperament.

After participants completed the measures, they were also asked to complete the SII (Hansen & Campbell, 1985) in order to measure the six GOTs and the 23 basic interest scales. After completion of both measures, relations of item responses to the approach system were analyzed. In order to confirm the researchers' hypothesis that vocational interests are influenced by the approach system, the researchers analyzed the percentage of like responses (global liking) and the percentage of dislike responses (global dislike) on the SII. They found a positive correlation between the approach temperament and degree of liking items ($r = .34, p < .01$). Approach temperament and the degree of disliking items (which was called "global dislike") were negatively

correlated ($r = -.22, p < .01$). The avoidant temperament showed no significant relations to global liking or disliking.

Additionally, Hansen and colleagues (2011) analyzed level of interests across the RIASEC using the GOTs to test their hypothesis that the approach system would be significantly related to both social and enterprising interests. Supporting their hypothesis, the only two interests across the RIASEC that were significantly related to the approach temperament system were social ($r = .29$) and enterprising ($r = .26$). No significant relations between the avoidance temperament and vocational interest across the RIASEC were found.

The findings of this study provide support for using alternate personality constructs related to approach and avoidance temperaments (i.e. BIS and BAS) to investigate vocational interest. However, Hansen and colleagues (2011) used a composite measure consisting of the MPQ-Brief Form (MPQ-BF; Patrick, Curtin, & Tellegen, 2002), the NEO-PI-R (Costa & McCrae, 1992), and the BIS/BAS scale (Carver & White, 1994) to conceptualize both approach and avoidance motivation. Although this composite measure was successful in providing a broad understanding of how approach and avoidance motivation may relate to vocational interest, it is uncertain how vocational interest may relate to a specific measure of approach and avoidance temperament rooted in a specific personality theory (e.g., Reinforcement Sensitivity Theory). By using a theory-specific measure (i.e. BIS/BAS scale), greater insight as to the relation between the BAS, BIS, and vocational interest may be gained.

Furthermore, despite the recognized relation between self-efficacy and interest (Donnay & Borgen, 1999; Rottinghaus et al., 2003), there is no mention of self-efficacy

in this study. Due to the significant relations that exist between self-efficacy, interest, and several personality domains (as outlined in this review), the relation of approach and avoidant motivation on self-efficacy appears to be an important area of investigation that has not been considered.

Current Study

The purpose of the present study is to validate the findings of Hansen and colleagues (2011), and to expand upon their findings that a meaningful relation between approach motivation and vocational interest exists, specifically with the GOTs of social and enterprising. This will be done through use of approach and avoidant motivation constructs and measures that are rooted in Reinforcement Sensitivity Theory (i.e. BIS/BAS scales; Carver & White, 1994). Although the constructs and subsequent measures of approach and avoidant motivation will be different, the moderate relationship between the BIS and BAS with Hansen and colleagues' composite constructs of approach and avoidant temperaments suggest that significant correlation between BAS with social and enterprising GOTs will be observed. Furthermore, Hansen and colleagues' (2011) findings regarding the meaningful relation of BAS to global liking and inverse relation to global dislike is expected to be replicated.

Hypothesis 1. BAS will have a meaningful positive relationship with "global liking," as defined by the percentage of "Strongly Like" responses during the SII.

Hypothesis 2. BAS will have a meaningful inverse relationship with "global dislike," as defined by the percentage of "Strongly Dislike" responses during the SII

Hypothesis 3. BAS will be meaningfully positively correlated with social and enterprising GOTs, and will have no meaningful relationship with the other GOTs.

Expanding on the findings by Hansen and colleagues, the relation between vocational self-efficacy and the BIS and the BAS will be investigated. Due to the strong

correlation between interest and self-efficacy, it is expected that only social and enterprising GCTs will be meaningfully correlated with BAS.

Hypothesis 4. BAS will be meaningfully positively correlated with social and enterprising GCTs, and will have no meaningful relationship with the other GCTs.

The last hypothesis is in regards to the relation between level of BIS activation and degree of self-efficacy, which is expected to have an inverse relationship, meaning that individuals who report higher BIS activation will report lower self-efficacy across each individual GCT and across the RIASEC as a whole. Although neuroticism and NEM were not found to have consistent correlations with any of the GCTs, both of these personality factors were shown to have an inverse relation with reported levels of self-efficacy with the GCTs of realistic, investigative, enterprising, and conventional (Barrick et al., 2003; Larson & Borgen, 2006; Larson et al., 2002). Neuroticism, NEM, and BIS were meaningfully loaded under the same avoidant factor in Hansen and colleagues' study, providing support for the hypothesis that vocational self-efficacy will be meaningfully related to the BIS.

Hypothesis 5. BIS will have meaningful correlation with the overall mean GCT scores across the RIASEC.

CHAPTER THREE: METHODS

The following sections will describe the study design and participant selection, as well as the materials used for the study. The relations among measured constructs will be discussed. Finally, the procedure, hypotheses, and analysis will be explained.

Study Design

The study was a cross sectional correlational design. Two measured variables were the behavioral activation system (BAS) and the behavioral inhibition system (BIS) as identified by the BAS/BIS scales (Carver & White, 1994). Because the BIS and BAS are independent of each other, each construct was measured separately from each other.

The other relevant variables were vocational interest, vocational confidence, self-perceived degree of reward and punishment in vocational activities, and global like and global dislike. Vocational interest was operationally defined by the six mean scores for the general occupational themes (GOTs) from the Strong Interest Inventory (SII; Donnay et al., 2005). Self-reports of confidence were operationally defined by the six mean score of the general confidence themes (GCTs) from the Skill Confidence Inventory (SCI; Betz et al., 2005). Global like and global dislike were defined as the “Strongly Like” and “Strongly Dislike” responses from the SII.

Neuroticism, extraversion, openness, and agreeableness, as conceptualized by Costa and McCrae (1992), were also measured using the 50 item International Personality Pool Items NEO-PI-R (Goldberg, 1999). This was to serve as a comparable variable to previously measured personality-interest and personality-confidence relations.

Participant Pool

Data for this study was collected from undergraduate students at a large upper Midwestern University. Students recruited from introductory psychology courses over the span of four semesters from fall of 2015 through the fall of 2016. Participants that participated asked to complete demographic information, as well as complete self-report measures related to personality, vocational interest, and vocational confidence. Using Cohen's table (Cohen, 1988; 1992), 76 individuals per variable (152 total) were needed to identify a moderate correlation (i.e. $r = .30$) between .A total of 324 students completed the measures over the four semesters.

Responses from 69 participants were eliminated due to incomplete or invalid responses. The final sample was 265 participants, with 100 individuals that identified as male and 165 that identified as female. The participants had an average age of 19.62 years old ($SD = 2.81$), and were 78.9% Caucasian, 4.5% Asian American/Pacific Islander, 3.8% Latino/a American, and 2.3% African American. There were 12 participants who (4.6%) identified as multiracial, and 14 identified as an International Student (5.3%). One participant (0.4%) chose not to indicate their race/ethnicity. All participants were college students, consisting of 40.4% first year students, 28.7% second year students, 14.3% third year students, 12.8% fourth year students, and 3.8% were students who have had five or more years of college education.

In regards to major satisfaction, 3.4% reported being very dissatisfied with their major, 6.4% were somewhat dissatisfied with their major, and 4.9% were indifferent. There were 70 participants that reported being somewhat satisfied with their major (26.4%), and 141 participants that reported being very satisfied with their major (53.2%).

There were 15 participants did not indicate their current level of satisfaction due to their major being undecided (5.7%).

Materials and Measures

The study was based online through the SONA research system at Iowa State University. Participants were allowed to sign up and complete the requirements on the computer of their choice. The first section of the survey was designed through Qualtrics.com. At the end of the survey, the participant was directed to the CPP.com website to complete the remaining portions of the survey.

Variable: Behavioral Inhibition System and the Behavioral Activation System

BIS/BAS Scale. The Behavioral Inhibition System and Behavioral Activation System Scale (BIS/BAS Scale; Carver & White, 1994; see Appendix A) is the most commonly used measure for investigating activation level of BAS and BIS (McNaughton & Corr, 2004; van der Linden et al., 2007; van der Linden et al., 2007), and has remained unchanged since it was first published. Comprised of a two-factor structure (BIS scale and BAS scale), there are 24 items that ask participants to rate how much they agree with statements related to how a person responds to both reinforcing and punishing stimuli/situations on a four-point likert scale, with higher scores indicating increased agreement with the statement. The BIS scale is composed of 7 items, and the BAS scale is composed of 13 items. The remaining 4 items are identified as fillers.

A confirmatory factor analysis done on 2,725 community individuals (1,417 women) supported the two-factor structure comprised of the BIS scale and the BAS scale (Jorm et al., 1998). The 13 items purported to relate to the BAS loaded under the BAS factor from .33 to .71. The factor loadings for the seven items purported to relate to

the BIS ranged from .40 to .73. Cronbach's alpha coefficients for both the BIS and the BAS scales were acceptable ($\alpha = .76$ and $.83$, respectively; Jorm et al., 1998). The Cronbach's alpha was found to be $.76$ for the BIS and $.81$ for the BAS in the present sample. The correlation between the BIS and BAS scales was $r = -.06$.

A common critique regarding the BAS/BIS Scale is that the measure has not been standardized, and that population norms have not been established (e.g., Elliot & Thrash, 2002; McNaughton & Corr, 2004). Means and standard deviations, therefore, could not be reported for general population. In an attempt to establish norms and validity, Jorm and colleagues (1998) provided results based off of 2, 725 community members living in Australia.

Variable: Big Five Personality Constructs

International Personality Item Pool Scales of the NEO-PI-R. The International Personality Item Pool (IPIP) Scales of the NEO-PI-R (Goldberg, et al., 2006; Goldberg, 1999; see Appendix B) were developed as a non-proprietary measure of personality, and include items that are identified as targeting similar constructs represented in the measurement of the Big Five in the same framework of the NEO-PI-R (Costa & McCrae, 1992). The scale has shown to have a medium to high correlation with between the NEO-PI-R and the corresponding IPIP scales. The corresponding scales between the IPIP Scales of the NEO-PI-R and the NEO-PI-R have mean correlation of $.73$ ($.94$ when corrected for attenuation resulting from unreliability; Goldberg et al., 2006), indicating that the constructs measured are strongly similar.

The recommended scale administration is through use of 50 five-point likert-type items that reflect how strongly an individual feels that a particular item describes them,

with lower scores indicating a stronger belief that the item is accurate for them. The responses include (1) Very True for Me, (2) Somewhat True for Me, (3) Somewhat False for Me, and (4) Very False for Me. An option was also provided for the participant to not indicate a response, and was labeled under Prefer Not to Answer. It was decided to not include items related to conscientiousness, as research has shown minimal relation of conscientiousness to the primary scales of the behavioral activation system or behavioral inhibition system (Keiser & Ross, 2011; Jorm et al., 1998) or to vocational interest and confidence (Larson et al., 2002). This resulted in the use of 40 items to assess neuroticism, extraversion, openness, and agreeableness. Information related to conscientiousness will not be reported.

It should be mentioned that the administration of these items is variable among researchers, as the items from the IPIP site have not been standardized due to the goals of providing a broad use of personality scales (Goldberg et al., 2006; Goldberg, 1999). This has resulted in variable item administration among researchers (Goldberg, 2001), and that there are no norms for these scales. Goldberg and colleagues encouraged researchers to be “very wary of using canned norms” due to the theoretical issue of considering any sample as fully representative of a researchers current participants (2006). The following reliability coefficients are reported from the original IPIP scale construction (Goldberg, 1999), which used the recommended five-point likert scale described in the above paragraph.

The five constructs identified in the IPIP scale has shown to be highly correlated with the five factors of personality discussed by Costa and McCrae (1992). Between two scales, the factors of neuroticism ($r=.82$), extraversion ($r=.77$), openness ($r=.79$),

agreeableness ($r = .70$), and conscientiousness ($r = .79$) were identified using factor analysis (Goldberg, 1999).

The Cronbach coefficient alphas were obtained through the 1999 study by Goldberg to determine the relation between the NEO-PI-R, as well as determine the psychometric properties of the measure. The study was conducted using a community sample of 501 adults, with approximately equal distribution of males to females. Cronbach coefficient alphas of the items representing the personality constructs of neuroticism subscales range from .77 to .86 (neuroticism = .86; extraversion = .86; openness = .82; agreeableness = .77; Goldberg et al., 2006; Goldberg, 1999).

A more recent study by McKay and Tokar (2012) with college students ($n = 437$) were consistent with the reported Cronbach coefficient values reported by Goldberg (1999) for the personality domains (r s range from .77 to .86). The alphas for the current study were .83 for neuroticism, .86 for extraversion, .75 for openness, and .73 for agreeableness.

Variables: Vocational Interests and Global Like/Dislike

Strong Interest Inventory. The Strong Interest Inventory (SII; Donnay et al., 2005; see Appendix C) measures vocational interests, and has been updated in its structure and content since it was originally introduced over 75 years ago (Donnay et al., 2005). The SII has 291 five-point likert type items that reflect various vocational activities, with higher scores indicating more interest in the respective activity. The percentage of items in which the participants endorsed Strongly Like (1), Like (2), Indifferent (3), Dislike (4), or Strongly Dislike (5) are reported at the end of the SII report and will be used in the study and will be called “Indices of Like and Dislike” with Global

Like defined as the percentage of the item responses that were endorsed as “Strongly Like” and Global Dislike defined as the percentage of item responses that were endorsed as “Strongly Dislike”. The item responses included the following sections: occupations, subject areas, activities, leisure activities, people, and characteristics.

The 2005 SII includes the six general occupational themes (GOTs) that were derived from Holland’s RIASEC hexagon described in the previous chapter. These six general occupational themes include realistic (R), investigative (I), artistic (A), social (S), enterprising (E), and conventional (C). As reported in the 2005 SII manual (Donnay et al., 2005), the combined gender standardized mean for each of the GOTs is 50 ($SD = 10$), although some means by gender vary by more than half of a standard deviation (Bailey, Larson, Borgen, & Gasser, 2008). Men had higher mean scores than women in the GOTs of realistic (55.03 [$SD = 8.87$]) and 44.97 [$SD = 8.42$], for men and women respectively; (Donnay et al., 2005). These findings are generally consistent with that of Bailey and colleagues’ (2008) study of 622 college students, with one exception. Bailey and colleagues found that mean scores for the conventional GOT were significantly higher for men (55.74 [$SD = 10.34$]) compared to women (51.44 [$SD = 10.82$]).

The Cronbach coefficient alphas were obtained through the 2005 General Representative Sample of 2, 250 adult women and men. Cronbach coefficient alphas of the SII subscales range from .90 to .95 (realistic = .92; investigative = .92; artistic = .95; social = .92; enterprising = .91; conventional = .90). There have been several more recent studies (e.g. Bailey et al., 2008; Staggs et al., 2007) with college students ($n = 622$ and 1, 872, respectively) that were consistent with the reported Cronbach coefficient values for the GOTs (.90 or higher across the RIASEC).

Test-retest reliability after 8-23 months was shown to range from .80 -.92 in a sample of 85 adults ($n = 57$ women, 28 men) that were originally identified from the General Representative Sample. In regards to the GOTs, multiple studies have shown that these results remain consistent across gender, race, and ethnic groups for prior versions of the Strong. (i.e. Day & Rounds, 1998; Day, Rounds, & Swaney, 1998; Fouad, Harmon, & Borgen, 1997) and the 2005 SII (e.g. Kanmneni, 2014) The GOTs have shown to be significantly predictive of occupational membership, regardless of gender, race, and ethnicity (Lattimore & Borgen, 1999).

The 2005 SII includes 30 basic interest scales, which are the more specific dimensions of interest that are considered to be housed within each of the six Holland RIASEC themes. Gasser and colleagues (2007) showed that the basic interest scales alone were significantly better able to accurately classify academic majors than the GOTs alone (Wilk's Lambda = .08 and .34, respectively), although it should be noted that use of the GOTs alone were also able to discriminate between majors.

The basic interest scales are listed below, and include range of means and standard deviations for both men and women for each BIS, as well as Cronbach's alpha. These results were based off of the findings of the General Representative Sample of 2, 250 adults listed in the SII manual (Donnay et al., 2005), and were consistent with the findings of Bailey and colleagues (2008). The combined gender standardized means were 50 (SD = 10). The reported test-retest validity across the basic interest scales range from .78-.89 (Donnay et al., 2005).

Related to the realistic GOT, there are six basic interest scales which include military (6 items: $\alpha = .89$), athletics (9 items: $\alpha = .91$), protective services (8 items: $\alpha =$

.83), mechanics/construction (11 items: $\alpha = .90$), nature/agriculture (12 items: $\alpha = .91$), and computer hardware/electronics (8 items: $\alpha = .92$). For all of the basic interest scales within the realistic GOT, the means for men were at least $\frac{1}{2}$ of a standard deviation higher than the means for women (Donnay et al., 2005). The four basic interest scales related to the investigative GOT include science (8 items: $\alpha = .87$), medical science (8 items: $\alpha = .84$), research (11 items: $\alpha = .82$), and mathematics (7 items: $\alpha = .91$; Donnay et al., 2005). Related to the artistic GOT, there are four basic interest scales that include writing/mass communication (10 items: $\alpha = .89$), performing arts (12 items: $\alpha = .87$), visual arts/design (10 items: $\alpha = .89$), and culinary arts (7 items: $\alpha = .87$; Donnay et al., 2005). The six basic interest scales related to the social GOT include social sciences (8 items: $\alpha = .80$), human resources/training (8 items: $\alpha = .85$), teaching/education (12 items: $\alpha = .88$), counseling/helping (10 items: $\alpha = .84$), religion/spirituality (8 items: $\alpha = .91$), and healthcare services (9 items: $\alpha = .85$; Donnay et al., 2005).

Related to the enterprising GOT, the six basic interest scales include law (7 items: $\alpha = .91$), sales (10 items: $\alpha = .88$), management (8 items: $\alpha = .81$), entrepreneurship (8 items: $\alpha = .85$), politics/public speaking (11 items: $\alpha = .90$), and marketing/advertising (10 items: $\alpha = .85$). The mean for politics/public speaking was half of standard deviation higher for men than for women (Donnay et al., 2005).

Lastly, the four basic interest scales related to the conventional GOT are taxes/accounting (7 items: $\alpha = .86$), programming/information systems (9 items: $\alpha = .88$), office management (9 items: $\alpha = .84$), and finance/investing (7 items: $\alpha = .86$; Donnay et al., 2005). Due to the proprietary nature of the Strong Interest Inventory, the alphas of the present sample were unable to be obtained.

Variable: Vocational Confidence

Skills Confidence Inventory. The Skills Confidence Inventory (SCI; Betz et al., 2005; see Appendix D), was developed to assess self-efficacy or confidence in the six general confidence themes (GCTs) that represent Holland's six themes, as described in the previous chapter. Each of the six GCTs are measured by a subscale specific to respective theme. The concurrent validity of the SCI has been shown to be acceptable, in that several studies have shown significant ability to predict career choice and aspirations (e.g., Rottinghaus & Betz, 2003; Donnay & Borgen, 1999). Furthermore, the SCI subscales have been shown to have moderate correlation with each of the respective GOTs from the SII. In one sample of 110 college students, the correlations between the GOTs and GCTs were calculated by combining both men and women, and found correlations ranged from .44 to .63 (realistic: .48, investigative: .47; artistic: .63, social: .50, enterprising: .44, conventional: .55).

When gender specific correlations were calculated, however, the correlations between the GOTs and GCTs were higher. For instance, in a sample of 250 college women, the correlations ranged from .61 (social and conventional) to .77 (investigative). In a sample of 81 college men, the correlations between the GOTs and GCTs ranged from .52 (conventional) to .84 (artistic). These correlations with the GOTs further support acceptable concurrent validity of the measure, as both of these measurements are commonly used together to assist with identifying successful occupation membership in career counseling (Betz et al., 2005).

Each GCT contains 10 items measured on a five-point likert scale (60 items total), with higher scores indicating more confidence in the given activity. Within a

college student sample ($n = 706$), the Cronbach coefficient alphas of the SCI subscales range from .85 to .87 (realistic = .87; investigative = .86; artistic = .85; social = .85; enterprising = .84; conventional = .86). Test-retest reliability ranged from .83 (realistic) to .87 (artistic) in a sample of 113 college students (Parsons & Betz, 1998). The alphas of the present study ranged from .81 to .87 (realistic = .81; investigative = .86; artistic = .86; social = .86; enterprising = .84; conventional = .87).

Data Collection

Prior to any data collection of this study, all procedures and methods were approved by the Institutional Review Board (see Appendix E) to ensure that this study adhered to the highest ethical and moral standards as defined by the American Psychological Association. After approval, recruitment and data collection began.

Participants were selected by using the mass testing of introductory Psychology students at a large Midwestern university, with IRB approval during fall of 2015 and spring of 2016. The participants who met the necessary criteria of completion of BIS/BAS scales (Carver & White, 1994) during the online mass testing and were considered as having adult status (i.e., 18 years and older) received an email that informed them that they had been selected to participate in the present study on the basis of their responses through mass testing. This initial invitation was followed by another email at three and six weeks to remind the individuals about the opportunity (see Appendix F). All emails contained information about the study, the link to the study, and contact information for the researcher if the participants were to have any questions prior to participation.

Within the mass-testing protocol, eligible participants completed the BIS/BAS scales (Carver & White, 1994) and a demographic survey that includes age, race/ethnicity, and gender. Prior to their participation in the study, individuals were presented with an informed consent (see Appendix G) that contained a brief description of the purpose of the study, study procedures, and their choice to discontinue the study at any time. Individuals were required agree to the informed consent by selecting “Yes” in order for them to continue.

Participants were also asked to report their current declared major, satisfaction with current major, and will be asked to report how likely they believed they will to graduate with a degree in that major. Their self-reported likelihood of changing majors was assessed through a six-point likert-scale, with higher scores reflecting greater intentions of changing their major prior to graduation (see Appendix H). The participants were then instructed to complete the IPIP Personality Items representing neuroticism, extraversion, openness, and agreeableness (Goldberg, 1999). After completion of the IPIP Personality Items, the participants were then instructed to the Skillsone.com website to complete both the SII and then the SCI.

During the summer and fall of 2016, the BIS/BAS scales were added to the Qualtrics portion of the study due to low recruitment numbers through mass testing (see Appendix J). Students who met the criteria of having adult status (i.e. 18 years and older) were recruited through introductory psychology and communication students. An independent samples t-test was conducted to identify if any significant difference for the main variables were present based on before or after the BIS/BAS scale was moved from mass testing. There was no significant difference between the main variable mean

scores (i.e. BAS/BIS Scale, IPIP Personality Items, the GOTs, or the GCTs) based on if the BIS/BAS scale was completed during mass testing or if it was part of the Qualtrics.com portion of the survey.

At the end of the study, the participants were given a full debriefing of the study purpose (see Appendix I). The researcher's contact information was given if the participants were to have any questions or concerns. Finally, information on campus and community resources for assistance in choosing a major and/or occupation were given if more information is desired.

Hypothesis Testing

For all of the hypotheses, the magnitude of the correlation expected in the hypotheses will near or above the absolute value of .2. This magnitude of correlation will be referred to as meaningful rather than significant with the understanding that meaningful includes that the correlation is significant. This magnitude has been used by other authors in this research literature (e.g., Larson et al., 2002; Larson & Borgen, 2006).

Hypothesis 1. The BAS, as measured by the BAS scale, will have a meaningful positive relation with "Global Liking," as defined by the percentage of "Strongly Like" responses during the SII.

Hypothesis 2. The BAS, as measured by the BAS scale, will have a meaningful negative relation with "Global Disliking," as defined by the percentage of "Strongly Dislike" responses on the SII.

Hypothesis 3. The BAS, as measured by the BAS scale, will be meaningfully positively related with social and enterprising GOTs as measured by the SII, and will have no meaningful relation with the other GOTs.

Hypothesis 4. The BAS, as measured by the BAS scale, will be meaningfully positively correlated with social and enterprising GCTs as measured by the SCI, and will have no meaningful relation with the other GCTs.

Hypothesis 5. The BIS, as measured by the BIS scale, will have meaningful negative correlation with mean GCT scores across the RIASEC as measured by the SCI.

CHAPTER FOUR: RESULTS

In this section, results of the study will be discussed. Descriptive statistics and preliminary analyses will be discussed first to provide a more accurate description of the data. This will be followed by the analyses of the hypotheses described above, and concluded with the results of additional analyses conducted.

Descriptive Statistics and Preliminary Analysis

An analysis of the data across the four semesters of data collection was conducted using the Bonferonni correction. During this analysis, only one significant difference at the .002 level was identified. Through the use of post-hoc comparisons, it was determined that individuals who participated during the summer of 2016 reported overall lower scores for the BIS subscale compared to the fall of 2015, spring of 2016, and fall of 2015. Given only one difference, semester was not considered further in the analyses.

The sample consisted of 265 undergraduate college students. Means and standard deviations for the 18 measured variables (BIS subscale, BAS subscale, neuroticism, extraversion, openness, agreeableness, the six GOTs, and six GCTs) are reported in Table 1 for the all participants. The means and standard deviations between genders were also identified and their means compared to identify any significant differences by reported gender. These differences are identified in Table 1. Using a Bonferonni adjustment of $(18/.05) p = .002$, the following were significantly different by gender: extraversion ($p = .001$), agreeableness ($p = .002$), realistic GOT ($p < .001$), social GOT ($p < .001$), conventional GOT ($p < .001$), realistic GCT ($p < .001$), and social GCT ($p < .001$). Men showed higher mean scores than women in regards to the mean

scores of realistic GOT and GCT, as well as conventional GOT and GCT. Women had higher mean scores in regards to extraversion, agreeableness, social GOT, and social GCT.

The means and standard deviations of this sample for the variables of interest were also compared to other comparable samples. In each case, the means were within ½ standard deviation of the comparable samples (BIS/BAS: Elliot & Thrash, 2002; IPIP NEO-PI-R: McKay & Tokar, 2012; SII (Donnay et al., 2005); SCI (Rottinghaus et al., 2002). This suggests that this sample was similar to other comparable samples.

Correlations between the measured variables were calculated, with the results reported in Table 2. At $p < .01$, the BAS correlated significantly positively with extraversion (.36), enterprising interests (.26), social confidence (.19), and enterprising confidence (.20), and was significantly negatively correlated with neuroticism (-.19). Clearly the BAS is not synonymous with the extraversion. The BIS significantly positively correlated with neuroticism (.46) and significantly negatively correlated with extraversion (-.26) and realistic (-.26) interests. The BIS is also clearly not synonymous with neuroticism. The relation of the IPIP variables with the GOTs and GCTs and well as the relation of the GOTs and GCTs are not the focus of this study and can be examined in Table 2.

The present study revealed similar correlation between BIS and neuroticism (.46) and between the BIS with agreeableness (.20) compared to Segarra, Poy, Lopez & Molto, 2014 and Keiser & Ross, 2011 (BIS/neuroticism: .55 to .59; BIS/agreeableness .23 to .26). Although the correlations represent the Big Five personality constructs through framework of Costa and McCrae's NEO-PI-R (1992), no studies could be

identified which use the IPIP scale with the BIS/BAS Scale (Carver & White, 1994). However, the correlation between the NEO-PI-R and the IPIP NEO-PI-R scale have shown to be adequately correlated between their respective scales (Goldberg et al., 2006; Johnson, 2000), which suggests that the findings revealed between studies using the NEO-PI-R by Costa and McCrae would be similar to the present study.

Hypotheses Analyses

Each hypothesis was tested using the Pearson product moment correlations between the BAS and the BIS with the SII Item Endorsement, the GOTs, and the GCTs. the total correlations can be found in Table 3 and the correlations for men and women can be found in Table 4. The correlations that were significantly different by gender are highlighted in Table 4. For the BIS and BAS, only two correlations were significantly different by gender; namely the BIS and enterprising confidence (males: $r = .13$; females $r = -.28$; $p < .01$) and the BIS and conventional confidence (males: $r = .23$; females $r = -.12$; $p < .01$). Given that these correlations were not relevant to any of the hypotheses, the total correlations from Table 3 were presented. Correlations near or above and absolute value of .20 will be considered meaningful for this study.

For Hypothesis 1 to be supported, the BAS, would have a meaningful positive relation to the “Strongly Like” variable. As indicated in Table 3, a moderate, meaningful, positive correlation between the BAS subscale and Strongly Like ($r = .32$; $p < .01$) was identified, supporting Hypothesis 1. That is to say, individuals who were more sensitive to reward were more likely to strongly like vocational activities.

For Hypothesis 2 to be supported, the BAS would have a meaningful negative relation with “Strongly Dislike.” As listed in Table 3, no significant relation between the

BAS and Strongly Dislike was found ($r = -.06$; $p > .05$). That is to say, an individual's sensitivity to reward appears unrelated to their reported dislike of vocational activities.

For Hypothesis 3 to be supported, there must be a meaningful positive relation of the BAS with both the social and enterprising interests, as measured by the GOTs. Furthermore, there must be no other significant relations between the BAS and the remaining GOTs of realistic, investigative, artistic, and conventional.

The BAS was found have a statistically significant and meaningful relation with the vocational interest domain of enterprising ($r = .26$; $p < .01$). When looking at the social GOT, no significant relation with the BAS was present in the current study ($r = .12$; $p > .05$). In regards to the GOTs of realistic, investigative, artistic, and conventional, there were no significant relations identified (r s ranging from $-.04$ to $.12$). Hypothesis 3 was partially supported in that the BAS related meaningfully to enterprising and no other meaningful correlations were identified. That is, sensitivity to reward appears to be related to enterprising interests, but not to other interests.

For Hypothesis 4 to be supported, the BAS, would have a meaningful positive relation with the social and enterprising GCTs. Furthermore, there must be no other meaningful relations between the BAS and the remaining GCTs of realistic, investigative, artistic, and conventional.

There was a meaningful significant correlation between BAS and the enterprising GCT ($r = .20$; $p < .01$) and social GCT ($r = .19$; $p < .01$). Furthermore, there was no significant relation between the BAS and the GCTs of investigative ($r = .06$), artistic ($r = < .01$), or conventional ($r = -.02$). There was, however, an unexpected significant, but

not meaningful, correlation between the BAS and the realistic GCT ($r = .13$; $p < .05$). Due to these results, hypothesis 4 was supported.

For Hypothesis 5 to be supported, the BIS would have a meaningful negative correlation with the overall mean GCT score. As can be seen in Table 5, the relation between the BIS and the mean GCT was not significant ($r = -.06$). That is to say, there was no relation between participants' sensitivity to punishment and how confident they feel in RIASEC-related vocational activities. However, It was observed that BIS had a significant negative relation with the realistic GOT ($r = -.26$; $p < .01$) but had null relations with the remaining 5 GOTs.

Additional Analysis: Extraversion and Neuroticism

In order to better identify any unique contribution of RST into the development of vocational interest, comparisons between the correlations of the BAS and the BIS with the GOTs were compared with the correlations of the corresponding construct from the IPIP. As Jorm and colleagues (1998) discussed that the BAS and extraversion both load on the same factor, the correlations between these two personality variables and the GOTs were considered the most similar across personality frameworks and therefore compared.

Cutting across the hypotheses substituting extraversion for the BAS and using Tables 3 and 4, I examined whether extraversion significantly correlated with global liking and global disliking, and exclusively correlated with the social and enterprising GOTs, and exclusively with the social and enterprising GCTs. Extraversion had significant positive relations with strongly like ($r = .20$; $p < .01$) and not with strongly dislike ($r = -.07$). However, as Table 4 demonstrates, the extraversion/global like and

extraversion/global dislike by gender significantly differed. For men the correlation for extraversion/global like was .39 ($p < .001$), and was -.30 ($p < .001$) for extraversion/global dislike. Women, however, had nominal relations between both extraversion/global like ($r = .09$) and extraversion/global dislike ($r = <.01$).

Extraversion significantly positively correlated with the social GOT ($r = .23$; $p < .01$) and the enterprising GOT ($r = .30$; $p < .01$). However, the correlations of extraversion and the social GOT were significantly different by gender such that the significant relation of extraversion and the social GOT were present for men only and not for women ($r_s = .40$ and $.06$, respectively). Extraversion did not significantly correlate with the other 4 GOTS. Extraversion also significantly correlated with the social GCT ($r = .37$; $p < .01$) and the enterprising GCT ($r = .29$; $p < .01$) and did not significantly correlate with the other four GCTS.

In sum, the relation of extraversion and global liking or global disliking vocational activities varied by gender such that only men had significant relations of extraversion with global like and global dislike. The relations of extraversion with both the enterprising GOT and enterprising GCT were similar to the relations of the BAS with both the enterprising GOT and enterprising GCT. The relation of extraversion with the social GCT was also similar to the relation of the BAS with the social GCT. However, the relation of extraversion and the social GOT appeared only for men; thus, the null relation of extraversion with social interests for women was similar to the null relation of the BAS and social interests in the total sample.

In regards to the BIS and neuroticism, it was observed that both of these personality factors loaded on the same factor as each other (Jorm et al., 1998).

Therefore, comparisons between correlations of these variables with the GOTs were conducted. Cutting across the hypotheses substituting neuroticism for the BIS and using Tables 3 and 4, I examined whether neuroticism significantly negatively correlated with the mean GCT. Neuroticism was not significantly related to the mean GCT.

Additional Analysis: Social and Enterprising Basic Interest Scales

In order to determine if the BAS and extraversion significantly positively correlated to specific social and enterprising basic interest scales similarly to social and enterprising GOTs, I examined the relevant correlations in Table 5. The BAS significantly positively correlated with five of the six enterprising basic interest scales (i.e. marketing and advertising, sales, management, entrepreneurship, and politics and public speaking) ranging from r s of .16 to .23 but correlated with only one of the six social basic interest scales, namely human resources and training with a correlation of .18. The BAS also significantly positively correlated with one realistic basic interest scale, namely athletics ($r = .24$) and one artistic basic interest scale, namely culinary arts ($r = .32$).

Extraversion correlated significantly positively with all six enterprising basic interests scales (i.e. marketing and advertising, sales, management, entrepreneurship, politics and public speaking, and law), ranging from r s of .17 to .29, and with three of six social basic interest scales (i.e. counseling and helping, teaching and education, and human resources and training) with r s ranging from .17 to .30. Extraversion also significantly positively correlated with two artistic basic interest scales, namely performing arts ($r = .17$) and culinary arts ($r = .33$). Extraversion was significantly

negatively correlated with one out of four conventional basic interest scales, namely programming and information systems ($r = -.20$).

The BIS was not hypothesized to relate meaningfully to any of the GOTs but was shown to significantly negatively correlate with the realistic GOT as shown in Table 3. The BIS was meaningfully negatively correlated with four of the six realistic BISs as shown in Table 5; mechanics and construction ($r = -.22$), computer hardware and electronics ($r = -.18$), military ($r = -.21$), and athletics ($r = .20$). The BIS correlated significantly with two other basic interest scales, one of which was a negative correlation, namely mathematics ($r = -.16$) and a positive correlation with counseling and helping ($r = .16$). Neuroticism significantly negatively correlated with only one realistic basic interest scale (athletics; $r = -.26$) and only one other basic interest scale across the RIASEC, namely entrepreneurship ($r = -.16$).

Additional Analysis: BIS and Global Like/Dislike

There were no hypotheses regarding the BIS and the percentages of likes and dislikes on the SII. However, the BIS significantly positively correlated with strongly dislike ($r = .16$) and indifferent ($r = -.29$).

CHAPTER FIVE: DISCUSSION

In this section, the results of the present study will be discussed, interpreted, and evaluated, in regards to each hypothesis and the study overall. The results of the additional analyses will also be discussed, including unexpected findings and the potential reasons for it. Study limitations and future recommendations will also be discussed, followed by the possible implications of the use of an alternate personality measure to help identify best-fit career choices.

Hypotheses Discussion

Behavioral Activation System and vocational interest. The present study showed that individual's level of reward sensitivity was moderately linked with an individual's tendency to strongly like various vocational activities (e.g., school subjects, occupations, etc.). As interest has been conceptualized as a motivation towards given activities that are perceived as positive and away from things that are perceived as negative (e.g., Staggs et al., 2007), it would suggest that being sensitive to rewards is related to globally liking vocational activities. Previous studies have identified that individuals with higher levels of the behavioral activation system report higher levels of hope, optimism, and goal-directed behaviors compared to those who have lower activation of the behavioral activation system (Corr, 2004; Carver & White, 1994). A related construct of approach motivation was also found to be significantly related to liking vocational activities (Hansen et al., 2011).

Contrary to the idea that the behavioral activation system would be meaningfully positively linked to global like, a contrasting hypothesis that the behavioral activation system would be negatively linked with global disliking was also made. However, the

results of the present study suggest that this relation did not exist, as no significant correlation was identified between these variables. This indicates that although the behavioral activation system is positively related with interest across broad vocational activities, the behavioral activation system does not negatively relate to disinterest across those same activities.

The behavioral activation system and the enterprising GOT were found to be meaningfully related, and the GOTs of realistic, investigative, artistic, and conventional were found to be nominally related to the behavioral activation system. The relation of the behavioral activation system with enterprising interests appears generally consistent with the literature, as there have been consistent relations identified between the related construct of extraversion and enterprising interests (i.e., Barrick et al., 2003; Larson et al., 2002). Moreover, social potency, a marker of extraversion, was also shown to be positively related to enterprising interests (Staggs et al., 2007). These results are also consistent with the relation of positive emotionality, one of the Big Three, with enterprising interests (Hansen et al, 2011; Staggs et al., 2007). Finally, this study's null findings of are consistent with previous findings of null relations between extraversion and the interests of realistic, investigative, artistic, and conventional (Barrick et al., 2003; Larson et al., 2002).

Beyond the conceptual and empirical relations between extraversion and the behavioral activation system, the findings of the present study appear consistent with the theory and biological underpinnings of the behavioral activation system, as described by Reinforcement Sensitivity Theory. In regards to the theoretical constructs, individuals that participate in enterprising activities are likely to be more attracted to

external motivations such as recognition, success, and monetary gains compared to internal rewards associated with vocational activities related to the social domains (Amabile, Hill, Hennessey, & Tighe, 1994). That is to say, the immediate reinforcement (Dufey, Fernandez, & Mourgues, 2011), which is likely to be attractive to individuals who have high levels of the behavioral activation system, is found in the reward characteristics of enterprising related careers. This possibility is supported by the findings of Pickering and Gray (2001), which indicated that individuals high in BAS tend to be more impulsive in their reward orientations and behaviors, suggesting a greater disposition towards immediate reinforcement.

In regards to the biological relation between the behavioral activation system and enterprising activities, the dopaminergic reward system is responsible for the level of activation for the behavioral activation system (Depue & Collins, 1999) and enterprising interests (Elliot & Thrash, 2002; Depue & Collins, 1999). As interest has been found to have a strong biological basis (Betsworth, et al., 1994), the identified relation between the behavioral activation system and enterprising interests is supported by the brain structures responsible for level of activation (Hansen et al., 2011).

One unexpected finding was the null relations of the behavioral activation system with social interests. Moreover, extraversion was nominally related to social interest for women in this sample. As discussed by Hogan (1983), both social and enterprising interests are posited to be connected by an underlying aspect of high sociability. However, previous research has identified differences in how some personality traits may differentially relate to social and enterprising interests. For instance, social closeness was found to relate to social interests, whereas social potency were found to

relate to enterprising interests (Staggs et al., 2007). This suggests that although social and enterprising interest may be connected by an underlying aspect of sociability, there may be differences in how social and enterprising activities are viewed as being rewarding.

There are several possibilities for this difference, including the use of different measures from the Hanson and colleagues (2011) study, which was a combination of the RST personality variables and other approach/avoidance measures. Moreover, Hansen and colleagues were using the 1985 version of the SII rather than the 2005 SII. It is also possible that the behavioral activation system does not relate to social interests due to the reward orientation of social career activities. Whereas there are multiple areas of the enterprising GOT that offer tangible and relatively immediate rewards (i.e. increased money, prestige, immediate feedback of performance), activities related to the social GOT are more likely to have rewards that are more abstract and delayed. For instance, a therapist may not have the opportunity to see immediate gains in their work, but rather has a greater orientation towards the meaning or purpose of the work. When the items of the BIS/BAS Scale are considered, many items relate to the former reward orientation (i.e. "When I see an opportunity for something I like I get excited right away"). Several studies found that individuals who have a high sensitivity to reward gave more effort to an occupational task when provided with monetary incentive (e.g. Gable et al., 2000; Jackson, 2001), providing support for this possibility. Additionally, this explanation is further supported by the findings of Pickering and Gray (2001) that have found individuals high versus low in the behavioral activation system tend to be more impulsive in their reward orientations and behaviors.

This possibility appears to be supported by the relation of the behavioral activation system to more specific vocational interests represented by the basic interest scales. There were eight total basic interest scales that were meaningfully related to the behavioral activation system. Five of these areas that were meaningfully related to the behavioral activation system were most closely related to the enterprising GOT (i.e. marketing and advertising, sales, management, entrepreneurship, and politics and public speaking). The remaining basic interest scales were athletics, culinary arts, and human resources and training. Interestingly, Staggs and colleagues (2007) showed in their meta analyses that athletics was positively related to social potency, a personality trait identified as a marker of extraversion (Tellegen, 2000). Moreover, Ackerman & Heggestadt's (2007) identification of four trait complexes cutting across ability, interests, and personality is also relevant. One of those complexes was the social complex and includes extraversion as well as social potency and wellbeing. Staggs et al. (2007) in their work showed that culinary arts and athletics were both related to wellbeing. It could be argued that enterprising areas have tangible and more immediate rewards than social areas, which may include money, the idea of winning, praise/recognition, or employee feedback.

Behavioral activation system and vocational confidence. The results indicated that the behavioral activation system had meaningful relations to vocational confidence for both social and enterprising activities, with no meaningful relation with the other domains. These findings support this hypothesis. These results are consistent with prior research that has shown positive relations of extraversion and enterprising confidence (e.g. Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006;

Nauta, 2004; Nauta, 2007; Rottinghaus et al., 2001); extraversion and social confidence (e.g. Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006; Nauta, 2004; Nauta, 2007; Rottinghaus et al., 2001), social potency and enterprising confidence (Larson & Borgen, 2006); and social closeness and social confidence (Larson & Borgen, 2006). Moreover, this study's null findings are consistent with previous findings of null relations between extraversion and realistic, investigative, and conventional confidence (Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006; Rottinghaus et al., 2001).

As the established correlation between interest and confidence (i.e. Rottinghaus et al., 2003), it would be expected that similar results for correlations between BAS and the vocational domains would occur. This is consistent with the idea that both social and enterprising interests are connected through a higher order construct of sociability (Hogan, 1983), as similar skills would be needed to be successful in either social or enterprising vocational domains. These results did show a similar pattern of the behavioral activation system being related to both enterprising interest and confidence. However, these findings presented that the behavioral activation system related to social confidence but not social interest. These mixed results corroborate Staggs, Larson, & Borgen's (2007) findings that social potency related to enterprising basic interest scales but not social basic interest scales whereas Larson & Borgen (2006) found that social potency related to both enterprising and social basic interest scales.

The relation of the behavioral activation system to social confidence but not social interest is intriguing and needs to be replicated. It may mean that if reward orientation was a factor as discussed in the preceding section, the reward orientation

may not be as salient in regards to confidence. If conceptualized using “Things versus People dimensions” (Prediger, 1976), both social and enterprising activities would require similar skill sets related to working with people. Therefore the reward orientation would be more salient in regards to an individual’s interest due to the career rewards that may motivate them, whereas the reward orientation would not be as influential in fostering the confidence of skills that would be necessary in both social and enterprising (i.e. communication, relating to others, etc.).

Behavioral inhibition system. It was also predicted that the behavioral inhibition system would have a meaningful negative relation with overall vocational confidence, as more neurotic and self-critical dispositions of individuals (e.g. Corr, 2004, Pickering & Gray, 2001) would theoretically lead to lower confidence in one’s abilities. The results, however, did not indicate any meaningful negative relation between the behavioral inhibition system and overall vocational confidence. However, these findings are consistent with Larson & Borgen (2006) who found that the relation of level of confidence and stress reaction, which is Tellegen’s (2000) marker for neuroticism, was null.

Surprisingly, there was a meaningful relation between the behavioral inhibition system and being indifferent towards vocational activities. Although this relation was not predicted nor identified in previous literature, this suggests that the more strongly someone endorses characteristics of behavior inhibition or sensitivity to punishment, the less likely they are to endorse being indifferent towards vocational activities. This is to say, that the individuals who have higher dispositions of punishment sensitivity will likely have stronger negative views towards activities. In other words, they have stronger

awareness of the things they do not like and would experience negative results from participating in said activities. This is further supported by the meaningful relation between the behavioral inhibition system and global dislike.

It was also observed that BIS had a negative meaningful relation with the realistic GOT, as well as four of the six realistic-basic interest scales. These scales include mechanics and construction, computer hardware and electronics, military, and athletics. Other areas that the behavioral inhibition system was meaningfully related to were mathematics and finance and investing. These vocational areas are often thought of as stereotypically masculine, and have implicit masculine values that suggest people in related careers should be stoic throughout all situations (Vogel & Heath, 2016). The items on the BIS subscale reflect ideas contrary to these beliefs (e.g. "Criticism or scolding hurts me quite a bit" or "I worry about making mistakes"), which would suggest that endorsing items related to the behavioral inhibition system would be contrary to these vocational interests related to the realistic domain. Thus, individuals that may endorse a realistic interest would likely avoid endorsing items related to the behavioral inhibition system so that they would not challenge the masculine stereotype.

One other personality trait has been negatively linked to realistic interests (Staggs et al., 2007), namely harmavoidance. The construct of harmavoidance is thought to represent an individual's preference for excitement and danger over caution and boredom, and was the first personality construct that was negatively related with the realistic interest area (Larson & Borgen, 2002; Staggs et al., 2003; Staggs et al., 2007). This study identified significant negative correlations of harmavoidance with the overall realistic GOT ($r = -.31$), as well as four out of five basic interest scales (r s range

from $-.15$ to $-.28$) from an earlier version of the SII (Staggs et al., 2007). As the behavioral inhibition system was found to relate to the realistic GOT in a similar pattern as harmavoidance, this may indicate an additional personality construct that relates significantly with the realistic GOT. That is to say, individuals that endorse interest in these areas are less sensitive to punishment.

Extraversion and Neuroticism

The relation of the behavioral activation system and global like/dislike revealed was not similar to the relation of extraversion and global like/dislike. The relation of extraversion and global like/dislike was negatively related for men only and null for women. These differential findings suggests that extraversion is related to but not the same as the behavioral activation system. This view is also supported by the moderate correlation of the BAS and extraversion in Table 2.

The behavioral activation system showed meaningful correlations with the enterprising interests, social confidence, and enterprising confidence. Extraversion showed similar correlations to enterprising interests as well as social and enterprising confidence. These findings are similar to prior literature that has shown extraversion to be related to enterprising interests (e.g., Barrick et al., 2003; Larson et al., 2002) and social and enterprising confidence (Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006 Rottinghaus et al., 2001). This study's null findings are consistent with previous findings of null relations between extraversion and the interests of realistic, investigative, artistic, and conventional (Barrick et al., 2003; Larson et al., 2002), as well as consistent null relations of extraversion with realistic, investigative, and conventional

confidence (Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006; Rottinghaus et al., 2001).

The null relation of the behavioral activation system and social interests in the total sample matched the null relation of extraversion and social interests for the women in the sample. These results corroborate Staggs, Larson, & Borgen's (2003) findings that social potency, a marker of extraversion, was related to enterprising basic interest scales but not social basic interest scales. Future researchers would want to explore this area further.

Neuroticism and the behavioral inhibition system yielded different relations with the relevant constructs in this study suggesting that they are different constructs. Neuroticism's pattern of correlations with the item endorsements on the SII looked different than the behavioral inhibition system's pattern as shown in Table 3. This difference supports the view that neuroticism does not capture sensitivity to punishment. Other evidence that neuroticism and sensitivity to punishment is related but different constructs can be found in the moderate correlation of the BIS and neuroticism in Table 2. Moreover, the behavioral inhibition system meaningfully correlated with four of the six realistic basic interest scales whereas neuroticism only correlated meaningfully with one of the realistic basic interest scales. This finding is consistent with prior literature that shows neuroticism to be mostly unrelated to the RIASEC interests (Barrick et al., 2003; Larson et al., 2002) and RIASEC confidence (e.g. Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006). It seems clear that the BIS does not perform the same as neuroticism and provides additional information particularly with regard to the relation

of sensitivity to punishment and general endorsement of vocational activities as well as sensitivity to punishment and specific realistic interests.

Limitations of Study

Several limitations exist within this study that should be noted. First the population sample was more homogeneous than ideal, with 78.4% identifying as Caucasian, and all participants being students from a large Midwestern university. Furthermore, the use of a computerized instrument eliminates the ability of evaluating participant investment in the study. At least one study (Barak & Cohen, 2002) has shown some evidence that individuals were more likely to indicate higher interest and confidence in the vocational domains of realistic, social, and enterprising when administered online versus paper and pencil. It was also recognized that a majority of the BIS/BAS Scale items were coded in the same direction, which may have created a responses bias towards the items.

Summary of Findings

The present study provides support for the unique use of Reinforcement Sensitivity Theory in relation to vocational interest and self-efficacy. The behavioral activation system was linked to the global like of vocational activities. That is to say, individuals who were more sensitive to reward were more likely to strongly like vocational activities across the RIASEC. Additionally, the behavioral activation system was uniquely related to enterprising interests and confidence. In other words, an individual's sensitivity to reward was related to both their interest and confidence related to the enterprising domain of the RIASEC. It was also found that the behavioral inhibition system was related to being less likely to be indifferent towards vocational

activities. That is to say, individuals that were more sensitive to punishment were more likely to have a define opinion about their interest to vocational activities, and were subsequently less likely to be ambivalent towards overall vocational activities. The present study also indicated an inverse relation between sensitivity to punishment and realistic interests and realistic related basic interest scales.

Implications and Future Research

Despite the recognized importance of personality in the development of vocational interests and self-efficacy, only two theories of personality have been used to investigate the relation of personality and these vocational factors. Larson (2011) has discussed the need for the use of alternative theories of personality may allow for a better understanding regarding the link between personality and vocational motivation. To date, one study has suggested initial support for use of a motivation-based theory of personality to investigate vocational interests (Hansen et al. 2011). No studies have been found to investigate the relation of a motivation-based theory of personality in relation to vocational self-efficacy, however.

The present study provides additional support for use of a motivation based theory of personality, specifically Reinforcement Sensitivity Theory (Gray, 1990). The present study suggests utility of the theoretically and empirically distinct constructs of the behavioral activation system and the behavioral inhibition system for investigating vocational interest and self-efficacy. In relation to the behavioral activation system, the present study has identified a link between this personality construct with global liking of vocational activities, as well as enterprising interest and confidence. The present study

also supports a relation between the behavioral inhibition system with having defined opinions about vocational activities and realistic interests.

When considering the generally consistent patterns that have been identified in the present data, several practical and novel areas of study are suggested. The relation of the behavioral activation system with enterprising interest and confidence needs to be replicated. As there appeared to be overlap of extraversion and the behavioral activation system with overall liking as well as enterprising interests and confidence, further study is warranted to determine the extent of this overlap. This will also allow for an increased understanding of the unique contribution of using the behavioral activation system while investigating vocational interests and self-efficacy.

The unexpected relation of the behavioral inhibition system and realistic interests would be an area of potential future research, as this has not been reported in the previous literature. Although this may indicate that the behavioral inhibition system is truly related to realistic, the similarity between how the behavioral inhibition system and harmavoidance suggests the possibility that these two personality constructs may be related at a more fundamental level. Further research examining the personality constructs of Tellegen's Big Three, particularly social potency and harmavoidance, and the constructs of Gray's Reinforcement Sensitivity Theory is warranted, especially as they relates to vocational interest and confidence. This would help to examine the uniqueness of contribution that RST has to offer the field of vocational psychology.

The relation of these constructs of Reinforcement Sensitivity Theory with vocational interests and confidence may provide several practical implications in regards to career counseling as well. Although use of personality has been suggested

as an important factor in career choice (Lent, Brown, & Hackett, 1994), the empirical relation of vocational interests (i.e., Barrick et al., 2003; Larson et al., 2002) and confidence (e.g. Harmon & Betz, 2007; Larson et al., 2007; Larson & Borgen, 2006; Rottinghaus et al., 2001) with personality has suggested limited meaningful links between these aspects. Because of this, the usefulness of personality in relation to career counseling can be limited to aspects of career longevity, performance, and stability (Holland, 1996). If additional linkages between vocational interests and self-efficacy can be identified using the behavioral activation system and behavioral inhibition system, these constructs may provide relevant and easily understandable tools for client use in both career exploration and career decision making. For example, a client who is identified as having a high activation of the behavioral activation system may find benefit from having specified exploration of enterprising career domains with a focus on rewards that they feel are offered by these careers.

Table 1
Descriptive Means for Complete Sample and by Gender

	<u>Mean(SD)</u>		
	Overall	Males	Females
BIS/BAS Scales			
BAS	3.04 (.41)	3.01 (.43)	3.05 (.41)
BIS ^a	3.07 (.55)	2.90 (.56)	3.17 (.52)
IPIP Scales			
Neuroticism ^c	2.69 (.79)	2.54 (.80)	2.78 (.77)
Extraversion ^a	3.21 (.80)	2.99 (.79)	3.34 (.77)
Openness	3.58 (.65)	3.51 (.61)	3.61 (.68)
Agreeableness ^b	3.77 (.52)	3.64 (.54)	3.85 (.49)
GOTs			
Realistic ^a	49.15 (9.83)	55.09 (8.87)	45.56 (8.58)
Investigative ^b	50.69 (10.33)	55.52 (9.68)	49.59 (10.58)
Artistic	49.17 (10.07)	47.30 (9.91)	50.30 (10.03)
Social ^a	50.96 (11.25)	46.20 (9.76)	53.84 (11.14)
Enterprising	47.51 (10.60)	47.64 (10.43)	47.43 (10.73)
Conventional ^a	47.15 (10.90)	50.84 (11.14)	44.92 (10.15)
GCTs			
Overall GCT Mean	2.90 (.50)	2.93 (.48)	2.88 (.51)
Realistic ^a	2.81 (.78)	3.07 (.77)	2.65 (.75)
Investigative	2.84 (.79)	2.98 (.77)	2.75 (.79)
Artistic ^c	2.85 (.83)	2.72 (.80)	2.93 (.84)
Social ^a	3.27 (.72)	2.98 (.65)	3.45 (.70)
Enterprising	2.91 (.68)	2.95 (.65)	2.89 (.70)
Conventional ^a	2.72 (.73)	2.89 (.72)	2.61 (.73)

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; ^a indicates significant difference between gender means at .001 level; ^b indicates significant difference between gender means at .01 level; ^c indicates significant difference between gender means at .05 level; $N = 265$

Table 2
Correlations among Constructs

	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness	Realistic Interest	Investigative Interest	Artistic Interest
BIS/BAS Scales									
BAS	0.81								
BIS	-0.06	0.76							
IPIP Scales									
Neuroticism	-0.19**	0.46**	0.83						
Extraversion	0.36**	-0.26**	-0.32**	0.86					
Openness	0.14*	0.06	-0.01	0.03	0.75				
Agreeableness	0.11*	0.20**	-0.28**	0.05	0.22**	0.73			
GOTs									
Realistic	0.07	-0.26***	-0.20**	-0.05	0.02	-0.12*	NA		
Investigative	0.03	-0.06	-0.07	-0.10	0.20***	0.03	0.47***	NA	
Artistic	0.11	0.06	0.09	0.10	0.55***	0.08	0.24***	0.18**	NA
Social	0.12	0.14*	0.02	0.23***	0.08	0.22***	0.08	0.19**	0.41***
Enterprising	0.26***	-0.03	-0.05	0.30***	0.01	-0.08	0.33***	0.05	0.34***
Conventional	-0.04	-0.08	0.04	-0.06	-0.09	-0.20***	0.54***	0.34***	0.20***
GCTs									
Realistic	0.06	-0.10	-0.16*	-0.08	0.15*	-0.09	0.65***	0.40***	0.14*
Investigative	<.01	-0.08	-0.12*	-0.12	0.15*	<.01	0.35***	0.70***	0.01
Artistic	0.10	0.01	0.08	0.09	0.51***	<.01	0.11	0.05	0.69***
Social	0.19**	0.12	0.01	0.36***	0.19**	0.21***	-0.09	0.12	0.21***
Enterprising	0.20**	-0.13*	-0.16**	0.39***	0.11	-0.04	0.13*	-0.08	0.16**
Conventional	-0.02	-0.02	-0.07	-0.05	-0.03	-0.10	0.35***	0.32***	-0.03

Table 2 (continued)

	Social Interest	Enterprising Interest	Conventional Interest	Realistic Confidence	Investigative Confidence	Artistic Confidence	Social Confidence	Enterprising Confidence	Conventional Confidence
BIS/BAS									
Scales									
BAS									
BIS									
IPIP Scales									
Neuroticism									
Extraversion									
Openness									
Agreeableness									
GOTs									
Realistic									
Investigative									
Artistic									
Social	NA								
Enterprising	0.44***	NA							
Conventional	0.27***	0.58***	NA						
GCTs									
Realistic	-0.11	0.11	0.23***	0.81					
Investigative	-0.14*	-0.14*	0.15*	0.59***	0.86				
Artistic	0.06	0.05	-0.05	0.34***	0.22***	0.86			
Social	0.52***	0.14*	-0.08	0.11	0.19**	0.29***	0.86		
Enterprising	0.03	0.47***	0.16**	0.34***	0.15*	0.35***	0.36***	0.84	
Conventional	-0.05	0.21***	0.51***	0.59***	0.56***	0.15*	0.17**	0.46***	0.87

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; $N = 265$

Table 3
Correlations between Personality Constructs, Global Like/Dislike, GOTs, and GCTs

	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness
Global Like/Dislike						
Strongly Dislike	-0.06	0.16**	0.08	-0.07	-0.11	0.04
Dislike	-0.03	-0.04	-0.06	-0.05	-0.02	0.02
Indifferent	-0.11	-0.29***	<.01	-0.03	-0.08	-0.09
Like	0.05	0.03	-0.03	0.08	0.13*	-0.07
Strongly Like	0.31***	0.13*	-0.04	0.20**	0.24**	0.11
GOTs						
Realistic	0.07	-0.26***	-0.20**	-0.04	0.02	-0.12*
Investigative	0.03	-0.06	-0.07	-0.10	0.20***	0.03
Artistic	0.12	0.06	0.09	0.10	0.55***	0.08
Social	0.12	0.14*	0.02	0.23***	0.08	0.22***
Enterprising	0.26***	-0.03	-0.06	0.30***	0.01	-0.08
Conventional	-0.04	-0.08	0.04	-0.06	-0.09	-0.20***
GCTs						
Overall GCT Mean	0.13*	-0.05	-0.10	0.13*	0.28***	-0.01
Realistic	0.06	-0.10	-0.16*	-0.08	0.15*	-0.09
Investigative	<.01	-0.08	-0.12*	-0.12	0.15*	<.01
Artistic	0.10	0.01	0.08	0.09	0.51***	<.01
Social	0.19**	0.12*	0.01	0.36***	0.19***	0.21**
Enterprising	0.20**	-0.13*	-0.16**	0.39***	0.11	-0.04
Conventional	-0.02	-0.03	-0.07	-0.05	-0.03	0.10

Note: * $p < .05$; ** $p < .01$; *** $p < .001$;
 $N = 265$

Table 4

Construct Correlations by Gender

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Males	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness
Item Endorsement						
Strongly Dislike	-0.05	0.16	-0.07	-0.30**	-0.09	0.12
Dislike	-0.01	-0.03	-0.01	0.07	0.11	0.06
Indifferent	-0.18	-0.28**	0.12	0.03	-0.14	-0.12
Like	0.03	0.01	0.02	0.09	0.10	-0.18
Strongly Like	0.39***	0.20	-0.07	0.36***	0.13	0.08
GOTs						
Realistic	0.16	-0.10	-0.08	0.19	-0.05	-0.10
Investigative	0.05	-0.03	-0.09	-0.06	0.19	0.09
Artistic	0.14	-0.02	0.13	0.24*	0.46***	-0.11
Social	0.10	0.00	0.01	0.40***	0.01	<.01
Enterprising	0.21*	0.02	0.10	0.42***	-0.09	-0.23*
Conventional	-0.09	-0.01	0.16	0.13	-0.14	-0.20*
GCTs						
Overall GCT Mean	0.21*	0.14	-0.01	0.14	0.19	-0.02
Realistic	0.20*	0.09	-0.08	<.01	0.04	-0.08
Investigative	0.11	0.03	-0.18	-0.19	0.19	0.13
Artistic	0.09	0.00	0.10	0.10	0.45**	-0.12
Social	0.26**	0.11	-0.01	0.41**	0.12	0.12
Enterprising	0.14	0.13	0.06	0.31**	0.10	-0.03
Conventional	0.03	0.23*	0.08	-0.03	-0.17	-0.07

Females

	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness
Item Endorsement						
Strongly Dislike	-0.08	0.13	0.13	<.01	-0.13	-0.06
Dislike	-0.04	-0.01	-0.08	0.09	-0.08	0.03
Indifferent	-0.05	-0.25**	-0.05	-0.01	-0.02	-0.03
Like	0.07	0.07	-0.05	0.09	0.17*	0.03
Strongly Like	0.26***	0.07	-0.04	0.09	0.29***	0.11
GOTs						
Realistic	0.07	-0.23**	-0.18*	-0.01	0.14	0.01
Investigative	0.04	-0.03	-0.02	-0.07	0.23**	0.05
Artistic	0.09	0.06	0.03	-0.04	0.60***	0.16*
Social	0.11	0.10	-0.05	0.06	0.08	0.26***
Enterprising	0.30***	-0.06	-0.15	0.24**	0.07	0.02
Conventional	0.01	-0.02	0.02	-0.10	-0.04	-0.13
GCTs						
Overall GCT Mean	0.09	-0.15	-0.14	0.16*	0.34**	0.02

Table 4 (continued)

	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness
Realistic	<.01	-0.12	-0.16*	-0.05	0.25**	-0.02
Investigative	-0.05	-0.09	-0.06	-0.04	0.15	-0.04
Artistic	0.11	-0.03	0.04	0.04	0.54***	0.03
Social	0.13	0.02	-0.06	0.27***	0.21**	0.18*
Enterprising	0.24**	-0.28***	-0.28***	0.47***	0.12	-0.04
Conventional	-0.03	-0.12	-0.12	-0.01	0.06	-0.06

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; Correlations highlighted in blue are significantly different by gender at the .05 level; Correlations highlighted in yellow are significantly different by gender at the .01 level; $N = 265$

Table 5

Correlations by Personality Constructs and Basic Interest Scales

BIS Organized by GOTs	Mean	SD	BAS	BIS	Neuroticism	Extraversion	Openness	Agreeableness
Realistic								
Mechanics and Construction	48.42	10.19	-0.04	-0.22***	-0.13*	-0.18**	0.05	-0.14*
Computer Hardware and Electronics	45.40	10.08	-0.03	-0.18**	-0.02	-0.17**	-0.01	-0.19**
Military	49.50	9.99	0.11	-0.21***	-0.15*	-0.03	-0.04	-0.17**
Protective Services	51.59	10.04	0.15*	-0.11	-0.07	0.08	0.03	-0.04
Nature and Agriculture	50.03	9.87	0.03	-0.08	-0.13*	0.03	0.14*	-0.01
Athletics	52.17	10.18	0.24***	-0.20**	-0.26***	0.28***	-0.15*	0.03
Investigative								
Science	51.28	9.99	0.00	-0.08	-0.05	-0.14*	0.19***	0.02
Research	46.95	10.25	0.00	-0.12	-0.10	-0.02	0.21***	-0.07
Medical Science	53.17	11.10	0.13*	0.01	-0.01	0.06	0.08	0.06
Mathematics	48.75	10.14	-0.03	-0.16*	-0.09	-0.12	-0.04	-0.05
Artistic								
Visual Arts and Design	49.42	10.70	0.11	0.01	0.08	-0.05	0.54***	0.04
Performing Arts	48.94	10.99	0.14*	0.05	0.06	0.17**	0.49***	0.14*
Writing and Mass Communication	47.21	9.74	0.03	0.13*	0.06	0.10	0.31**	0.01
Culinary Arts	51.27	9.84	0.32***	-0.08	-0.11	0.33**	0.20**	0.02
Social								
Counseling and Helping	50.90	10.56	0.12	0.16**	0.10	0.17**	0.20***	0.29***
Teaching and Education	51.11	11.91	0.10	0.11	-0.05	0.21***	0.10	0.17**
Human Resources and Training	46.47	10.42	0.18**	0.06	-0.01	0.30***	<.01	0.08
Social Sciences	48.36	9.78	0.05	0.05	0.03	0.05	0.34***	0.04
Religion and Spirituality	47.79	9.02	0.08	-0.04	-0.12*	0.10	-0.01	0.14*
Healthcare Services	54.55	12.03	0.11	0.11	-0.01	<.01	0.12	<.01

Table 5 (continued)

Enterprising

Marketing and Advertising	47.24	10.25	0.23***	0.02	-0.02	0.27***	0.09	-0.05
Sales	50.68	11.32	0.17**	-0.05	0.01	0.18**	-0.09	-0.16**
Management	48.30	9.48	0.16*	0.01	<.01	0.20**	-0.08	-0.09
Entrepreneurship	44.22	11.57	0.26***	-0.04	-0.16**	0.17**	0.07	-0.04
Politics and Public Speaking	48.06	9.86	0.16**	-0.14*	-0.05	0.29***	0.17**	-0.13*
Law	49.38	10.60	0.10	0.06	0.07	0.19**	-0.01	-0.09

Conventional

Office Management	48.88	9.69	-0.03	0.08	0.13*	0.02	-0.10	-0.13*
Taxes and Accounting	47.46	9.60	-0.08	-0.10	<.01	-0.12	-0.13*	-0.15*
Programming and Information Systems	43.60	10.47	-0.02	-0.12*	-0.01	-0.20**	0.09	-0.15*
Finance and Investing	46.16	10.14	0.09	-0.16**	-0.12	0.08	-0.08	-0.17**

Note: * $p < .05$; ** $p < .01$; *** $p < .001$; $N = 265$

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APPENDIX A: BIS/BAS SCALE (CARVER & WHITE, 1994)

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

- 1 = very true for me
- 2 = somewhat true for me
- 3 = somewhat false for me
- 4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.

11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.

21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

APPENDIX B: IPIP NEO-PI-R (GOLDBERG, 1999)

On the following pages, there are phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes *you*. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then fill in the bubble that corresponds to the number on the scale.

Response Options

- Very Inaccurate
- Moderately Inaccurate
- Neither Inaccurate nor Accurate
- Moderately Accurate
- Very Accurate

1. Am not easily bother by things.
2. Tend to vote for liberal political candidates.
3. Am skilled in handling social situations.
4. Respect others.
5. Suspect hidden motives in others.
6. Believe that others have good intentions.
7. Don't like to draw attention to myself.
8. Don't talk a lot.
9. Would describe my experiences as somewhat dull.
10. Insult people.
11. Have a vivid imagination.
12. Am often down in the dumps.
13. Have frequent mood swings.
14. Know how to captivate people.
15. Feel comfortable around people.
16. Rarely get irritated.
17. Have little to say.
18. Feel comfortable with myself.
19. Am very pleased with myself.
20. Accept people as they are.
21. Get back at others.
22. Avoid philosophical discussions.
23. Tend to vote for conservative political candidates.
24. Am not interested in abstract ideas.
25. Do not like art.
26. Am the life of the party.
27. Often feel blue.
28. Have a good word for everyone.
29. Carry the conversation to a higher level.
30. Panic easily.
31. Make people feel at ease.
32. Have a sharp tongue.
33. Cut others to pieces.
34. Make friends easily.
35. Believe in the importance of art.
36. Seldom feel blue.
37. Dislike myself.
38. Do not enjoy going to art museums.
39. Enjoy hearing new ideas.
40. Keep in the background.

APPENDIX C: STRONG INTEREST INVENTORY (SII; DONNAY ET AL., 2005)

Sample Items Only: Full Inventory will be provided day of proposal due to copyright

Section 1- Occupations

For each occupation listed, indicate how you would feel about doing that kind of work. Do not worry about whether you would be good at the job or about not being trained for it. Forget about how much money you could make or whether you could get ahead. Think only about whether you would like to do the work in that job.

- Fill in the oval labeled “SL” for Strongly Like if you think you would definitely like that kind of work.
- Fill in the oval labeled “L” for Like if you think you would probably like that kind of work.
- Fill in the oval labeled “I” for Indifferent if you are indifferent (that is, if you think you wouldn’t care one way or another).
- Fill in the oval labeled “D” for Dislike if you think you would probably dislike that kind of work.
- Fill in the oval labeled “SD” for Strongly Dislike if you think you would definitely dislike that kind of work.

1. Accountant
2. Actor/Actress
3. Administrative assistant
4. Advertising executive

APPENDIX D: SKILLS CONFIDENCE INVENTORY (SCI; BETZ ET AL., 2005)

Sample Items Only Due to Copyright

Instruction. The *Skills Confidence Inventory*, which is used to help you assess your level of confidence in performing tasks and activities and studying school subjects related to work, leisure, and educational pursuits. Your confidence, along with your work interests, may add important information for you to consider when you make educational and career decisions and plans. In the sections that follow, you will be asked to indicate your level of confidence in each task, activity, or school subject. Please read the instructions for each section before you proceed.

PLEASE ANSWER EVERY QUESTION. DO NOT SPEND TOO MUCH TIME THINKING ABOUT EACH ONE.

RELY ON YOUR FIRST IMPRESSION

PART I. TASKS AND ACTIVITIES

Many tasks and activities are listed below. For each task or activity, indicate your degree of *confidence* in your ability to perform that task or activity. If you have

- **no confidence at all**, mark the space labeled “1”
- **very little confidence**, mark the space labeled “2”
- **moderate confidence**, mark the space labeled “3”
- **much confidence**, mark the space labeled “4”
- **complete confidence**, mark the space labeled “5”

1. Act in a play
2. Be elected to an office in an organization
3. Be in charge of ordering supplies for a hospital or large business
4. Comfort a patient experiencing severe pain
5. Develop a financial plan for your retirement
6. Work on commission, with pay based on the amount you sell
7. Do research work
8. Teach or tutor children
9. Express your ideas publicly
10. Conduct a financial audit

APPENDIX E: INSTITUTIONAL REVIEW BOARD APPLICATION FOR STUDY

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 6/10/2015

To: Dustin Baker
W112 Lagomarcino

CC: Dr. Lisa Larson
W216 Lagomarcino Hall

From: Office for Responsible Research

Title: Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

IRB ID: 15-265

Approval Date: 6/9/2015

Date for Continuing Review: 6/8/2017

Submission Type: New

Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Retain signed informed consent documents for 3 years after the close of the study**, when documented consent is required.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. **Approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **IRB approval in no way implies or guarantees that permission from these other entities will be granted.**

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

APPENDIX F: INITIAL AND FOLLOW-UP RECRUITMENT EMAIL

EMAIL COMMUNICATION (first email)

Subject Line: Psychology Study: Earn research credit!

Title of Study: Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

We are seeking psychology undergraduate students to participate in a completely online study designed to better understand how predisposed tendencies of approach and avoidance may impact career interest and self-efficacy. Please note that participation in any part of the study is entirely voluntary and you may stop at any point.

If you agree to participate in this study, you can earn 2 research credits. This is a completely online study designed to better understand your perceptions of therapy. You will be responding to a series of questionnaires including items about your interest and confidence in a variety of career-related activities.

In addition, records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. You must be 18 years of age to participate in this study.

This is a research study. Please take your time in deciding if you would like to participate. You are encouraged to ask questions at any time during this study. You may wish to delay participation until your questions have been answered. For further information about the study, please contact the Principal Investigator, Dustin F. Baker at dfbaker@iastate.edu. You may also contact the supervising faculty member, Dr. Lisa Larson, at lmlarson@iastate.edu or 294-1487. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office of Research Assurances, Iowa State University, Ames, Iowa 50011.

If you would like to participate, please go to the SONA website [<https://isuppsych.sona-systems.com/>] and sign up using the following password: ISUPpsych012. From the SONA site, you can follow the link to the online survey.

Thank you in advance for your time.

Sincerely,

Dustin Baker, M.S.
Doctoral Graduate Student
Department of Psychology
Iowa State University
dfbaker@iastate.edu

REMINDER EMAIL COMMUNICATION (2nd, 3rd, and 4th email)

Title of Study: Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

Subject Line: Reminder - Psychology Study: Earn research credit!

This is a reminder that we are seeking psychology undergraduate students to participate in a completely online study designed to better understand how predisposed tendencies of approach and avoidance may impact career interest and self-efficacy.

If you agree to participate in this study, you can earn 2 research credits. This is a completely online study designed to better understand your perceptions of therapy. You will be responding to a series of questionnaires including items about your interest and confidence in a variety of career-related activities. The measures are expected to take 50 minutes.

In addition, records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. You must be 18 years of age to participate in this study.

This is a research study. Please take your time in deciding if you would like to participate. You are encouraged to ask questions at any time during this study. You may wish to delay participation until your questions have been answered. For further information about the study, please contact the Principal Investigator, Dustin F. Baker at dfbaker@iastate.edu. You may also contact the supervising faculty member, Dr. Lisa Larson, at lm Larson@iastate.edu or 294-1487. If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office of Research Assurances, Iowa State University, Ames, Iowa 50011.

If you would like to participate, please go to the SONA website [<https://isuppsych.sona-systems.com/>] and sign in using the following password: ISUPpsych012. From the SONA site, you can follow the link to the online survey.

Thank you in advance for your time.

Sincerely,

Dustin Baker, M.S.
 Doctoral Graduate Student
 Department of Psychology
 Iowa State University
dfbaker@iastate.edu

APPENDIX G: INFORMED CONSENT

INFORMED CONSENT DOCUMENT

Title of Study: Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

Investigators:

Dustin F. Baker, M.S.

Lisa M. Larson, Ph.D.

This is a research study. Please take your time in deciding if you would like to participate. You are encouraged to ask questions at any time during this study. You may wish to delay participation until your questions have been answered. For further information about the study, please contact the Principal Investigator, Dustin F. Baker, M.S. at dfbaker@iastate.edu. You may also contact the supervising faculty member, Dr. Lisa Larson, at lm Larson@iastate.edu or 294-1487.

INTRODUCTION

The purpose of this study is to examine how predisposed temperaments of approach and avoidance may influence vocational interest and self-efficacy. You are invited to participate in this study because you are a student in the Psychology and/or Communications department at Iowa State University and you participated in the Psychology Department's Mass Testing in the Spring of 2014, where you completed a measure of sensitivity to reward and punishment.

DESCRIPTION OF PROCEDURES

This is a completely online study designed to better understand how approach and avoidant temperaments relate with your interest and self-efficacy in vocational activities. You will be responding to a set of survey measures. These surveys ask questions about your interest and confidence in a variety of vocational activities. This should take about 50 minutes and is worth one research credit. If you feel uncomfortable answering any questions, you can skip these questions and still receive credit. If you decide to end your participation early, you will also be given full credit.

RISKS

We do not anticipate that these procedures will cause you any harm, but if you experience discomfort you may talk to the investigators about your concerns. You are free to skip any question that you do not wish to answer or that make you feel uncomfortable. You are also free at any time to choose to end your participation. There will be no negative effects if you choose to skip a question or discontinue your participation in the study. If you choose to end your participation all data collected will be erased.

BENEFITS

If you decide to participate in this study there will be no direct benefit to you other than learning about psychological research from a participant's perspective. Your participation in this project may help the researchers develop a better understanding of how predisposed temperaments of approach and avoidance may influence vocational interest and self-efficacy.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. In addition, there is no monetary compensation for your participation. Rather, you will be compensated by receiving research credit in your undergraduate psychology or communication course for participating in this study. If you agree to

participate in this study, you will earn 1 research credits for participating in the study. If you choose not to participate, you may contact the Course Information Office (515-294-8065) for alternative research options in order to earn research credit for your class.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. If you choose to leave the study early, however, credit will still be granted.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. Only the researchers on this study will have access to the data, however, auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken to protect your privacy including: (a) assigning you a unique code number that will be used instead of your name; (b) combining your data with the data collected from other participants so that no individual information will be identifiable (c) all data will stored in a locked filing cabinet and/or password protected computer and destroyed 5 years after results are published (d) the online survey site (SurveyMonkey.com) employs multiple layers of security to protect all data before it is transmitted to the researcher. If the results are published, your identity will remain confidential.

QUESTIONS OR PROBLEMS

You are encouraged to ask questions at any time during this study. For further information about the study, you can contact the Principal Investigator, Dustin F. Baker, M.S. at dfbaker@iastate.edu. You may also contact the supervising faculty member, Dr. Lisa Larson, at lmlarson@iastate.edu or 294-1487.

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

PARTICIPANT SIGNATURE

By clicking “yes” below, you are indicating that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document and that your questions have been satisfactorily answered. You may wish to print a copy of this informed consent document for your files since this is an online study.

Do you agree to participate in this study? If you click “yes”, you will continue to the survey questions. If you select “No,” you will exit the survey.

- a) Yes
- b) No

APPENDIX H: MAJOR SATISFACTION SURVEY

Please indicate your current major:

How satisfied with your major are you?

- 1) Very Satisfied
- 2) Somewhat Satisfied
- 3) Indifferent
- 4) Somewhat Dissatisfied
- 5) Very Dissatisfied

In your opinion, how likely are you to graduate with a degree in this major?

- 1) Very Likely
- 2) Somewhat Likely
- 3) Unsure
- 4) Somewhat Unlikely
- 5) Very Unlikely

APPENDIX I: IRB MODIFICATION APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4500
FAX 515 294-4267

Date: 5/31/2016

To: Dustin Baker
W112 Lagomarcino

CC: Dr. Lisa Larson
W216 Lagomarcino Hall

From: Office for Responsible Research

Title: Relation of Reinforcement Sensitivity on Vocational Interest and Self-Efficacy

IRB ID: 15-265

Approval Date: 5/27/2016 **Date for Continuing Review:** 6/8/2017

Submission Type: Modification **Review Type:** Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Retain signed informed consent documents for 3 years after the close of the study**, when documented consent is required.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. **Approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **IRB approval in no way implies or guarantees that permission from these other entities will be granted.**

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

APPENDIX J: DEBRIEFING

Debriefing Statement

Thank you for your participation. The study you just participated in was designed to better understand the relation of approach/avoidance temperament with vocational interest and self-efficacy. Increased understanding of this relation will provide a better understanding of the factors that help to determine career choice. As mentioned before, all responses will be kept confidential and identifying information (i.e., names) will be removed at the end of your participation today. Your data will also be combined with the data of other participants to further ensure anonymity. These data will be kept in a locked cabinet, in a locked office.

If you have any concerns about the study you just participated in, please talk to one of the experimenters. If participation in this study raised concerns about your body image, thoughts about food, or eating behaviors that you would like to discuss with a counselor, please visit one of the community resources listed below.

If you have any additional questions about this investigation you may contact the Principal Investigator, Dustin Baker, M.S. at dfbaker@iastate.edu, or the Major Professor, Dr. Lisa Larson, can be contacted at lm Larson@iastate.edu or 294-1487.

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, Office for Responsible Research, (515) 294-3115, 1138 Pearson Hall, Ames, IA 50011.

Community Referrals

Student Counseling Service. 3rd Floor Student Services Bldg. Ames, IA 294-5056

Career Exploration Services. 2030 Student Services Bldg. Ames, IA 294-0742