

THE RELATIONSHIP BETWEEN IMPULSIVITY AND HOPE

BY

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Abstract

This study examined the relationships among scores on the Snyder Hope Scale (HS-R2; Shorey, Little, Rand, & Snyder, 2005) and three measures of impulsivity. Significant negative correlations were found between all subscale and full-scale scores of the HS-R2 and all scales of the Barrat Impulsiveness Scale (Patton, et al., 1995), the dysfunctional impulsivity scale of the Dickman Impulsivity Inventory (DII; Dickman, 1990), and the sensitivity to punishment scale of the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (Torrubia, et al., 2001). All HS-R2 subscale and full-scale scores correlated positively with the functional impulsivity scale of the DII. This pattern of relations was not explained by the mediating effects of mental health. The findings are interpreted as suggesting that one's level of impulsivity is foundational and may influence the subsequent development of the constituent components of Snyder's Hope construct.

THE RELATIONSHIP BETWEEN IMPULSIVITY AND HOPE

Although impulsivity has been of interest to researchers for many years, differing definitions have made it difficult to directly compare studies. Examples of definitions include: “the tendency to act quickly without reflection” (Eysenck, 1952, p.193); preference for “the immediate over the well-reasoned response” (Schweizer, 2001, p.1031); and “orientation toward the present, diminished ability to delay gratification, behavioural disinhibition, risk taking, sensation seeking, boredom proneness, reward sensitivity, hedonism, and poor planning” (Petry, 2001, p.30). Impulsivity is thought to involve behavior that lacks forethought and planning, actions that are initiated rapidly, and actions that are undertaken without due consideration for negative or long term consequences (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001).

The scientific study of impulsivity burgeoned after it was included in several of the major personality trait theories developed in the 1950’s. Cattell (1979) included a factor called boldness vs. timidity in his Sixteen Personality Factor Questionnaire (16PF). Impulsivity is included as one of the descriptors for someone categorized on the boldness end of the factor. Impulsivity also was central to Eysenck’s early formulations of his Biological Trait Theory (Eysenck, 1982). Eysenck and Eysenck (1977) designed an impulsivity instrument that included four different subscales (or factors): (1) impulsivity in the narrow sense (IMPN), (2) risk taking (RISK), (3) nonplanning (NONP), and, (4) liveliness (LIVE). While these four factors are intercorrelated, they correlate differentially with the “psychoticism,” “neuroticism,”

and “extraversion” scales of Eysenck’s personality inventory. Although all four factors have larger environmental than genetic loadings, the factors involving impulsivity in the narrow sense and risk taking have stronger genetic loadings than do nonplanning and liveliness (Eaves, Eysenck, & Martin, 1989). Eysenck and Eysenck (1971) also found that psychopaths and criminals scored high on impulsivity. Eventually, impulsivity came to be defined as part of the psychoticism trait, fitting with the research on criminality (Eysenck & Eysenck, 1976).

Gray (1981) was critical of Eysenck’s restricted view of impulsivity and saw it as a major axis going between the Extraversion and the Introversion traits. In this scheme, high impulsivity is found in people high on Extraversion and Neuroticism, while low impulsivity is found among those high on Introversion and Stability. Gray’s (1981) view of impulsivity also incorporated differential susceptibility to reward and punishment, with highly impulsive people being highly influenced by rewards, especially short term rewards, but less susceptible to being influenced by punishment. In Gray’s scheme, this asymmetrical relationship is opposite for people who are high in anxiety, with rewards having a lesser influence on actions and potential punishments having greater importance.

Gray (1982) suggested a three-arousal model to explain the differences between impulsive and anxious subjects. In this model, people have three arousal systems interacting with each other to influence goal directed behavior. The behavioral approach system (BAS) is stimulated by the possibility of reinforcement or goal attainment. When activated, the BAS promotes goal-directed behavior.

Conversely, the behavioral inhibition system (BIS) is stimulated by the possibility of punishment, leading to inhibition of goal-directed behavior. In addition, there is a nonspecific arousal system (NAS) that is influenced by the level of activity in both the BAS and BIS systems. This model has been used to conceptualize the distinction between high impulsivity and high reflectivity. People high on impulsivity are thought to be more BAS driven, while reflective people are considered more BIS driven. These latter conjectures were supported in a study on the effects of reward and punishment on the speed of a tracing task. Participants scoring high on neuroticism and extraversion (impulsive) had faster tracing times when there was a possibility of reward. In contrast, participants scoring high on neuroticism and introversion (reflective) had faster tracing times when poor performance could lead to punishment (Wallace & Newman, 1990).

Gray (1990) also claimed that the BIS and BAS systems are responsible for our emotions, especially those related to goal-directed behaviors. The BIS system is thought to activate negative feelings such as anxiety, fear and sadness. Conversely, the BAS system is responsible for positive feelings such as happiness and excitement. Heightened BIS or BAS activation has been hypothesized to be an important factor for several mental disorders, with an overactive BAS system implicated in Attention-Deficit/Hyperactivity Disorder (Quay, 1988) and an overactive BIS system possibly resulting in anxiety or depression (Fowles, 1993). Franken, Muris, and Georgieva (2006) also found that higher BAS activity was significantly related to drug addiction.

In summary, it appears that impulsive individuals show enhanced goal behavior when there is the prospect of immediate reward, but may be insufficiently inhibited by aversive consequences. This could explain why impulsive people seem to suffer from faulty cost benefit analysis in goal approach situations, often striving to achieve goals that lead to more negative than positive outcomes (Bechara & Damasio, 2002; Nower, Derevensky, & Gupta, 2004). Highly impulsive people may be too focused on goals that promise short-term rewards to effectively plan for long-term goals (Bachara & Damasio, 2002). This hypothesized reward “hypersensitivity” has been linked to nonnormal activity in the orbitofrontal cortex, with impulsive as compared to normal persons having increased activity for rewards and decreased activity when rewards are not expected (Harmon-Jones, Barratt, & Wigg, 1997; Martin & Potts, 2004).

Kagan (1989) claimed the difference between impulsive and what he termed reflective persons also could be found in situations with no specific or salient rewards. From this viewpoint, impulsivity is not so much dependent on rewards or punishments but, rather, results from being in novel or uncertain situations. According to Kagan, impulsivity and reflectivity can be seen as a “tendency for persons to exhibit fast or slow decision times in situations of high uncertainty” (Kagan, 1989, p.155). Theoretically, impulsive individuals quickly adopt the first option that comes to mind in novel situations without considering if it is a good solution. In contrast, a reflective person may weigh several options before deciding. This latter strategy is likely to be the more successful one, except in situations

involving insufficient time for reflection. Kagan (1966) designed the Matching Familiar Figures (MFF) test to identify reflective and impulsive individuals. Compared to reflective individuals, those classified as impulsive on the MFF were found to do worse on problem solving tasks, to have lower IQ scores, and to score lower on reading tests. These differences remained after controlling for levels of education and self-reported problem solving skills (Heckel, et al., 1989).

While Eysenck, Gray, and Kagan have defined impulsivity as a largely dysfunctional trait when it comes to performance and goal achievement, Dickman (1990) distinguished between functional and dysfunctional impulsivity. For Dickman, functional impulsivity represents a personality trait wherein the person has the ability to process cognitive information very rapidly. Theoretically, such impulsivity can be beneficial when information processing speed is important for good performance. On the other hand, dysfunctional impulsivity, which ostensibly involves problems in inhibiting dominant responses, impairs performance in most situations by leading to a larger number of wrong responses. Indeed, Dickman (1990) found that people who were high on functional impulsivity did process information more quickly, but also were prone to more errors. Functional impulsivity, then, is likely to be most beneficial when there is no punishment for making errors. Although Dickman's initial study did not show any difference between persons who were normal as opposed to high on dysfunctional impulsivity, later studies have found higher levels of dysfunctional impulsivity to be associated with more errors (Brunas-Wagstaff, Bergquist, & Wagstaff, 1994). Whereas functional impulsivity can be viewed as a positive when

used in the right situations, dysfunctional impulsivity will be negative in most situations because it reflects a failure to inhibit wrong (dominant) responses.

Heaven (1991) found that Dickman's dysfunctional (as compared to functional) impulsivity was more correlated with impulsivity as defined by Eysenck. Functional impulsivity was only weakly correlated with Eysenck's definition of impulsivity, and this correlation was only significant for women. The same study found that dysfunctional impulsivity was negatively correlated with self esteem and positively correlated with negative attitudes toward the family. Functional impulsivity was positively correlated with self esteem.

Smillie and Jackson (2006) attempted to place functional and dysfunctional impulsivity within Gray's behavioral activation (BAS) and inhibition (BIS) systems. They hypothesized that functional impulsivity results from high sensitivity to the BAS and a lower sensitivity to the BIS. They claim this is conceptually similar to what Gray (1991) has termed reward reactivity. Results from studies by Smillie and Jackson (2006) did support this conception, with functional impulsivity being correlated with higher BAS sensitivity and lower BIS sensitivity.

Barratt and Stanford (1995) used a discipline-neutral model for defining impulsivity. Although most researchers explain impulsivity from a discipline standpoint, Barratt combined biological, social, cognitive and behavioral perspectives (Fossati, Di Ceglie, Acquarini, & Barratt 2001). For example, the Barratt Impulsiveness Scale was designed such that impulsivity items were orthogonal with anxiety items (Barratt, 1965). The reason for this was that impulsivity and anxiety

usually are seen as opposite traits. Impulsivity also was defined within the matrix of related personality traits such as Eysenck's Extraversion (Patton, Stanford, & Barratt, 1995).

The Barratt Impulsiveness Scale has gone through many revisions since the first version in 1965, and currently the 11th version is being used (BIS-11; Patton, et al., 1995). Most of the revisions have involved tailoring the scale to accord better with the many different impulsivity theories. The BIS-11 identifies three subtraits of impulsivity: motor (Im), attentional (Ia), and nonplanning (Inp). Motor impulsivity involves acting without thinking. Attentional impulsivity entails an inability to maintain focus on the task at hand. Nonplanning impulsivity reflects an excessive focus on the present or lack of planning for the future. Factor analysis of the BIS-11 identified six first-order factors, two for each impulsivity subtrait. For motor impulsivity the factors were: motor impulsivity or "acting on the spur of the moment" and perseverance or "a consistent lifestyle." The first-order factors for nonplanning impulsivity were: self-control or "planning and thinking carefully" and cognitive complexity or "enjoy challenging mental tasks." The first-order factors for attentional impulsivity were: attention or "focusing on the task at hand" and cognitive instability, or "thought insertions and racing thoughts" (Patton, Stanford, & Barratt, 1995, p. 770).

Although several theories have been put forth to explain and define impulsivity, there is wide agreement that one's level of impulsivity influences how one processes information and makes decisions. As noted above, impulsivity can be

viewed as reflecting an inability to plan for future goals and an excessive focus on short-term rewards. Impulsivity, then, may elucidate hypotheses and findings derived from theories of goal-directed behavior. Snyder's hope theory (Snyder et al., 1991) has emerged as one of the most influential of these goal theories in the last decade.

Hope Theory

Snyder, Irving, and Anderson (1991) defined hope as “a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)” (p. 287). Hope is a cognitive set involving an interaction between pathways and agency thinking, as directed toward desired goals. Individuals believing that they can create the pathways or routes to reach their goals (pathways thinking), along with the motivation to use these pathways (agency thinking), are thought of as hopeful. High-hope individuals, therefore, believe they have both the means and motivation to reach desired goals (Snyder, 2000).

Goals

Hope theory postulates that all human behavior is goal directed. Goals can be of any size, from seemingly unimportant everyday targets to large, overarching objectives that influence many behaviors. Goals also have varying time frames, from short-term ones placed only minutes or hours into the future, to long-term ones that may require years to achieve. Goals also can have different degrees of specificity, with some being clearly defined and others being only vaguely conceived. In turn, clear goals hypothetically facilitate pathways thinking as compared to vague goals

where even the wanted end state may be unclear. Different goals also have different values to the person pursuing them, with high-value goals theoretically creating more agency thinking than low-value goals. A goal must pass a certain value level before the person will invest effort in pursuing it (Snyder, 1994).

Snyder (2002) also differentiated “approach” and “avoidance” goals. As the labels imply, approach goals entail achieving perceived positive outcomes, whereas avoidance goals involve forestalling perceived negative outcomes. Both goal types can inspire agency and pathways thinking, but approach goals are thought to lead to more energetic efforts. In addition, selecting one type of goal may leave less energy available to pursue others (e.g. selecting many avoidance goals may leave little energy available for approach goals).

Pathways

Within Hope theory, pathways thinking reflects the perceived capacity to generate routes to reach goals. Several pathways may be imagined for a specific goal, but a person will typically pursue only one primary pathway. If the chosen pathway is blocked or unsuccessful, the individual may pursue alternative pathways. As with goals, pathways can be vague or specific, with specific pathways having a higher likelihood of leading to success. Snyder (2002) theorized that pathways also are refined and made more specific as the person moves closer to a goal. High-hope individuals are more confident and adept at creating pathways than are their low-hope counterparts (Yoshinobu, 1989). When encountering goal blockages, high-hope persons should usually be more successful than low-hope persons because they are

more facile at generating and implementing new pathways (Snyder, Lehman, Kluck, & Monsson, 2006).

Agency

According to Snyder and his associates (Snyder, Harris, Anderson, Holleran, Irving, et al., 1991) agency thinking is the perceived capacity to find the motivation to use a chosen pathway to reach a desired goal. Such thinking is influenced both by the belief that a pathway will work and the belief that one will be able to complete the pathway. If a person has little faith in a successful goal pursuit, the odds of mustering or sustaining the required energy are reduced. Agency, then, is not only the motivation to start along a pathway, but also to continue along it once initiated. Theoretically, high-hope people typically have the needed agency or motivation to succeed in their goal pursuits. Successfully reaching a goal, in turn, not only provides feedback about what types of pathways are most effective, but also boosts agency thinking by increasing the belief in future achievements. Theoretically, agency is crucial when a pathway has been blocked because it provides the motivation to create or pursue alternative pathways (Snyder, 2002).

High Hope vs. Low Hope

Hope can be both a state and a trait, with trait hope representing the person's long-term level of hope, and state hope reflecting a more short-term form of hope that is influenced by both trait hope and "here-and-now" situational factors. The Snyder Hope Scale (HS-R2; Shorey, Little, Rand, & Snyder, 2005), a revised version of the Trait Hope Scale (Snyder, Harris, et al., 1991), was developed specifically to assess

trait hope. The scale measures levels of pathways thinking, agency thinking, goals thinking, and overall hope. Although it is possible to have any combination of scores on the subscales, a person who is high in hope typically will have high levels on all scales, whereas a low-hope person will tend to have low scores.

High-hope persons are theorized to approach goals differently from their low hope counterparts (Snyder, Harris, et al., 1991). High-hopers tend to pursue their goals more actively and to select goals that require reasonable efforts to achieve (Harris, 1988). By selecting such “stretch” goals those persons who are high in hope should manage to keep their motivations elevated as they will see their goals as challenges (Snyder, 2002). High-hope individuals may pursue even easy goals in a fashion that makes them unique and challenging (Snyder & Fromkin, 1980). On the other hand, individuals who are low in hope tend to have fewer (Langelle, 1989), and more avoidance-based goals. Comparatively speaking, their goals often are more vaguely defined, making them harder to achieve. Also, Snyder (2002) theorized that a low-hope person’s goals often require either little effort to attain or are so ambitious that they are impossible to achieve. Low-hope individuals also appear to have deficiencies in pathways thinking: They create few potential pathways to desired goals (Yoshinobu, 1989), and are hypothesized to stick to the first pathway that comes to mind (Snyder, 2002). Deficiencies in creating pathways present problems if goal blockages are encountered. Whereas high-hopers tend to view obstacles as challenges, low-hopers may be discouraged by them (Irving, Snyder, Crowson,

1998), leading to their investing less energy in the goal pursuit or perhaps relinquishing the pursuit altogether (Snyder, 1999).

High- as compared to low-hope people use more effective thinking and behavior throughout goal pursuit sequences (Anderson, 1988). Most high-hopers have many strategies, such as positive self-talk and a preference for positive self-referential input, to boost their agency thinking. In contrast, low-hopers have comparatively little faith in their goal pursuits (Anderson, 1988) and tend to focus on negative input and earlier failures, resulting in depleted confidence and motivation (Snyder, LaPointe, Crowson Jr., & Early, 1998).

Where Hope and Impulsivity Meet

Both hope and impulsivity involve goal-directed processes. Many of the findings associated with high or low impulsivity also have been found among those who are high or low in hope, thereby highlighting a possible relationship between the two constructs.

One important link between hope and impulsivity, for example, pertains to the ability to plan. One of the second-order factors in the Barratt Impulsiveness Scale (BIS-11), nonplanning impulsiveness, represents an overly strong focus on the present, including a lack of ability or motivation to plan for the future (Patton, et al., 1995). Future planning is of great importance during goal pursuits, especially when creating pathways, deciding which routes will work best, and how to achieve the wanted goals (Snyder, 1994). Such skills seem to be relatively lacking both in people

who are impulsive and those who are low in hope (Patton, et al., 1995; Yoshinobu, 1988).

Another goal pursuit characteristic that impulsive and low-hope individuals appear to share is the tendency to choose short-term, easily-attainable goals rather than more difficult long-term ones (Snyder, 2002). Perhaps impulsive people fail to recognize that long-term goals may yield larger rewards, or they may lack the motivation to pursue long-range goals (Bechario & Damasio, 2002).

Attentional impulsiveness, another second-order factor in the BIS-11 (Patton, et al., 1995), involves difficulties with focusing on the task at hand, as well as problems with racing thoughts during goal pursuits. As described previously, low-hope people also are thought to have difficulty during goal pursuits due to ruminating and concentrating on negative feedback, as well as being easily distracted and focusing on information that is not helpful (Snyder, et al, 1998).

Whereas several studies have uncovered an association between high hope and good psychological and social adjustment (Kwon, 2002; Snyder, Harris, et al., 1991), impulsivity has been linked to problematic psychological adjustment (Moeller, et al., 2001). Eisenberg et al. (2004), for example, reported that impulsivity was related to difficult adjustment, anger, and problem behaviors in a sample of children between 4.5 and 8 years of age. Children high in impulsivity also were more likely to internalize problems. This may be similar to low-hope individuals' tendency to focus on negative self-relevant information (Snyder, et al., 1998).

Hope has been shown to have a positive relationship with academic performance (Snyder, Cheavens, & Michael, 1999). Snyder (2002) theorized that high-hope students are able to focus on the long-term goal of graduating without being sidetracked by negative thoughts or unimportant short-term goals. Spinella and Miley (2003) advanced similar explanations for their finding of an inverse relationship between BIS-11 scores and academic grades. They hypothesized that impulsive students are unable to stay focused on long-term academic goals and get sidetracked by short-term demands.

Several studies have found an association between impulsivity and such behaviors as binge eating, drug use and compulsive gambling (Hayaki, Stein, Lessor, Herman, & Anderson, 2005; Nasser, Gluck, & Geliebter, 2004; Nower, et al., 2004). The behavior in all of these instances can be compared to what is often found in low-hope individuals in that they have difficulty focusing on long-term goals due to the temptations of more immediate rewards (Snyder, Shorey, Cheavens, Pulvers, Adams, & Wiklund, 2002). In cases of binge eating, for example, the person can be viewed as satisfying a short-term craving for unhealthy food in preference to the long-term goals of losing weight or having a healthy lifestyle.

Current Study

The current study was designed to explore the potential relationship between the concept of hope and the various conceptions of impulsivity. Three different ways of conceptualizing impulsivity were examined. First, the Barratt Impulsiveness Scale-11 was used to explore the relationship between level of hope and a broad-based

conception of impulsivity. The initial hypothesis here was that hope would be inversely correlated with BIS-11 impulsivity. Theoretically, nonplanning impulsivity and attentional impulsivity, especially, should be associated with low Snyder Hope Scale scores.

Second, the relationship between hope and impulsivity, as defined by Gray's (1982) conception of impulsivity, was explored. It was expected that there would be a curvilinear relationship between BIS and BAS activation and hope, with high Snyder Hope Scale scores being associated with moderate scores on BIS and BAS activation. This constellation was expected because successful goal pursuit requires the ability to be aware of both rewards and punishments and to estimate their relative likelihood. However, hope was expected to correlate more positively with BAS scores than with BIS scores because positive goal pursuits should require more of the positive motivation provided by the BAS system. It also was expected that people with low trait hope would have either very high or very low scores on sensitivity to reward and sensitivity to punishment, as both of these patterns would theoretically be detrimental to goal pursuits, especially those involving long-term objectives.

Third, the relationship between level of hope and functional and dysfunctional impulsivity as defined by Dickman (1990) was examined. Here it was expected that high hope would be positively correlated with functional impulsivity, and negatively associated with dysfunctional impulsivity.

Finally, another goal of this study was to examine which of the three ways of looking at impulsivity has the highest correlation with the hope construct. All of the

models of impulsivity have certain facets that fit with the hope model. Finding the model that correlates most strongly may make it possible to extend hope theory into a new area and to use some of the findings from the impulsivity research to generate new hypotheses about hope.

Design and Methods

This study examined the relationship between levels of trait hope, as measured by the Snyder Hope Scale, and levels of impulsivity, as measured by the Barratt Impulsiveness Scale-11 (Patton, et al., 1995), the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (Torrubia, Àvila, Moltó, & Caseras, 2001), and the Dickman Impulsivity Inventory (Dickman, 1990). A measure of psychopathology, the Mental Health Inventory (MHI; Davies, et al., 1988), also was included because both level of impulsivity and level of hope have been found to correlate with several mental disorders and this could possibly present a confounding variable for the current study (Moeller, et al., 2001).

Participants

One hundred seventy undergraduate students (Mean age=19.42) from the University of Kansas Psychology Department participant pool participated in the study in return for partial course credit. The sample consisted of 78 females and 92 males. As a normal distribution of levels of hope was wanted, participants were not selected based on specific scores on the Snyder Hope Scale.

Procedures

The participants, who were conducted through the study in groups of from one to six and were seated in individual isolation cubicles so they could not see one another while completing questionnaires, were informed that the study related to goal directed behaviors, were presented with an informed consent form, and were asked to fill out a self-report questionnaire packet consisting of a demographics form, the Snyder Hope Scale (HS-R2), the Barratt Impulsiveness Scale-11 (BIS-11), the Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ), the Dickman Impulsivity Inventory (DII), and the Mental Health Inventory (MHI). The order of the questionnaires was randomized across participants to avoid order effects. Participants were instructed to remain seated until everyone had completed the questionnaire packets and they had received a short debriefing. During the debriefing they were told the study examined the relationship between hope, impulsivity, and sensitivity to reward and punishment.

Measures

The Snyder Hope Scale.

The HS-R2 (Shorey, Little, Rand, & Snyder, 2005), a revised version of the Trait Hope Scale (Snyder, Harris, et al., 1991) was used to establish participants' level of hope. This scale consists of 18 items: 6 pathway items, 6 agency items, and 6 goal items. The items are rated on an 8-point Likert scale (1 = Definitely False, 8 = Definitely True). Half of the items are reversed scored. The HS-R2 has been found to be a reliable and valid measure of the hope construct (Shorey, et al., 2005).

Cronbach's alphas for internal consistency ranged from .86 to .88 for the overall scale and from .64 to .81 for the subscales. Confirmatory factor analysis demonstrated excellent fit with the overall hope model (χ^2 154.83, $df = 72$, $p < .01$, RMSEA = .059 (90% CI = .045; .072), NNFI = .98, CFI = .99). In addition, generalizability of the model was established with multi-group factor analysis. Across three samples, the HS-R2 evidenced strong metric invariance (equality of variances, covariances, factor loadings, and latent means).

Barratt Impulsiveness Scale-11 (BIS-11).

The BIS-11 (Patton, et al., 1995) was used to assess participants' level of impulsivity. The BIS-11 is a self report questionnaire consisting of 30 items that are rated on a four-point Likert scale (1 = Rarely/Never, 4 = Almost Always/Always). The BIS-11 is thought to measure trait impulsivity and, therefore, should match well with the HS-R2. The BIS-11 has been found to be a reliable and valid instrument (Patton, et al., 1995). Factor analysis has uncovered six first-order factors; 1. attention, 2. motor impulsiveness, 3. self-control, 4. cognitive complexity, 5. perseverance, 6. cognitive instability. There also are three second-order factors; attentional impulsiveness (consisting of first-order factors 1 and 6), motor impulsiveness (consisting of first-order factors 2 and 5), nonplanning impulsiveness (consisting of first-order factors 3 and 4).

The BIS-11 has been found to have adequate internal consistency, with Cronbach's alphas of .82 for undergraduates, .79 for substance abuse patients, .83 for psychiatric patients, and .80 for prison inmates. The scale scores also significantly

differentiated among these groups, with undergraduates scoring lower than the other groups (Patton, et al., 1995). The scale also has demonstrated good test-retest reliability, usually with correlations ranging from .79 to .89 (Fossati, et al., 2001; Someya, et al., 2001). The BIS-11 has significantly differentiated between personality disordered samples and other populations where differences in impulsivity would be expected (Patton, et al., 1995) and correlates well with such behavioral measurements of impulsivity as mirror tracing, visual jump reaction time, and auditory reaction time (Barratt, 1965). Scores on the BIS-11 also have been found to be significantly related to EEG wave patterns and ERP measures that are hypothesized to indicate high or low impulsivity (Barratt, et al., 1987). In addition, the BIS-11 scores appear to be uncorrelated with the State-Trait Anxiety Index (STAI), a measure with which it is theoretically unrelated (Barratt, 1987). Because the BIS-11 not only has been found to be a reliable and valid instrument, and is based on a broad theoretical and scientific base, it is the instrument that was be used to measure impulsivity in the current study.

The Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ)

The SPSRQ (Torrubia, et al., 2001) was used to measure participants' Behavioral Approach System (BAS) and Behavioral Inhibition System (BIS) functioning. The SPSRQ is a self report questionnaire consisting of 48 yes-no questions. Twenty-four questions make up the sensitivity to punishment scale and 24 questions make up the sensitivity to reward scale. Studies reported by Torrubia, et al.

(2000) found the questionnaire to correlate highly with other measures of BIS and BAS activation.

Dickman Impulsivity Inventory (DII)

The DII (Dickman, 1990) was used to measure participants' levels of functional and dysfunctional impulsivity. The inventory consists of 23 True/False questions, with 11 making up a functional impulsivity scale and 12 making up a dysfunctional impulsivity scale. The instrument has been found to have adequate internal consistency (Chico, Tous, Lorenzo-Seva, & Vigil-Colet, 2003).

Mental Health Inventory (MHI)

The MHI (Davies, et al., 1988) was used to control for the potential confounding effects of mental health problems. The MHI consists of 38 items, 36 of which are scored on six-choice response scales and two of which are scored on five-choice response scales (for question format see Appendix E.). It was designed for use in nonclinical samples. The inventory yields six subscales, three of which (anxiety, depression, loss of behavioral/emotional control) combine to form a global psychological distress scale, and three of which (general positive affect, emotional ties, and life satisfaction) combine to form a psychological well being scale. The MHI has been found to have good internal consistency, with Cronbach's alphas for the two global scales ranging from .92 to .96. Test-retest reliabilities over a one-year period ranged from .54 to .64 (Veit & Ware, 1983). The anxiety, depression, loss of behavioral/emotional control and general positive affect subscales were used in the current study.

Results

The overall sample of questionnaires contained less than 0.5% missing data. One participant's data were deleted as the participant had not followed instructions. The remaining missing data were evenly distributed among the study questionnaires and appeared to be missing at random. Missing data points were estimated using the maximum likelihood estimation protocol in SAS 9.1.

Cronbach's alphas for the BIS-11 first-order factors of perseverance ($\alpha=.345$), and cognitive instability ($\alpha=.491$) did not reach acceptable levels (George & Mallery, 1999). Previous studies using the BIS-11 do not report the alphas for the first-order factors (e.g. Patton, et al., 1995). Due to their low internal reliability, the BIS first-order factors were not used in subsequent analysis. All BIS-11 second-order factors (attentional impulsiveness: $\alpha=.748$; motor impulsiveness: $\alpha=.631$; nonplanning impulsiveness: $\alpha=.727$) and the full scale ($\alpha=.845$) reached acceptable levels of internal consistency. Cronbach's alphas for all other scales passed acceptable values.

Descriptive Statistics

The final sample included 77 females and 92 males. The means and standard deviations for the different full scales and subscales are given by total sample and by gender in Table 1. The mean age for the sample was 19.42 (range = 18 to 37). The sample consisted of 102 Freshmen, 46 Sophomores, 15 Juniors, 5 Seniors and 1 Graduate student. The ethnic breakdown of the sample was as follows: White (139), African American (9), Asian/Pacific Islander (8), Hispanic (6), Other (mostly biracial; 5), Native American (1), and Middle Eastern (1).

Table 1.

Full Scale and Subscale Means for all Measures by Total Sample and Gender						
	Total Sample N = 169		Females N = 77		Males N = 92	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
HS-R2 Goals	6.05	1.09	6.15	1.09	5.97	1.09
HS-R2 Pathways	6.16	.93	6.17	.95	6.14	.92
HS-R2 Agency	6.29	1.13	6.38	1.14	6.22	1.12
HS-R2 Full Scale	6.17	.92	6.23	.95	6.11	.91
BIS Attentional Impulsiveness	2.14	.52	2.08	.59	2.18	.44
BIS Motor Impulsiveness	2.06	.38	2.03	.38	2.09	.38
BIS Nonplanning Impulsiveness	2.18	.46	2.15	.46	2.21	.46
BIS Full Scale	2.13	.37	2.09	.38	2.16	.35
DII Functional Impulsivity	.56	.29	.50	.28	.60	.29
DII Dysfunctional Impulsivity	.29	.26	.30	.27	.28	.25
Sensitivity to Punishment	.45	.22	.46	.23	.43	.21
Sensitivity to Reward	.58	.16	.53	.16	.63	.15
MHI Anxiety	2.56	.83	2.60	.89	2.52	.78
MHI Depression	2.28	.85	2.35	.85	2.22	.84
MHI Loss of Behavioral Control/Emotional Control	1.99	.68	2.09	.67	1.91	.68
MHI General Positive Affect	3.83	.87	3.88	.88	3.79	.86

In order to test for possible effects of gender on hope and the different impulsivity measures, separate one-way ANOVAs were run for gender on all HS-R2 scales, BIS-11 full-scale and second-order factors, DII functional and dysfunctional impulsivity, and SPSRQ scales. Gender differences were found for DII functional impulsivity, with male participants ($M=.60$) reporting significantly higher functional impulsivity relative to females ($M=.50$; $F(1,168)=5.64, p<.05$). A similar gender effect was found for sensitivity to reward with male participants ($M=.63$) reporting significantly higher levels than female participants ($M=.53, F(1,168)=15.39, p<.01$). None of the other ANOVA's for gender were significant. Although gender was found to have an effect on two of the subscales used in the study, overall it did not appear to have a strong influence on impulsivity or hope. Gender was therefore collapsed as a factor during the rest of the analyses.

In order to test for possible effects of ethnicity on hope and the different impulsivity measures, separate one-way ANOVAs were run for ethnicity on all HS-R2 scales, BIS-11 full-scale and second-order factors, DII functional and dysfunctional impulsivity, and SPSRQ scales. Ethnicity had no significant effect on any of the scales, and separate analyses for different ethnicities were therefore not conducted.

In order to test for possible effects of age, class or family income on hope and impulsivity, bivariate linear correlations were run for the relationships among age, class, and family income and all measured variables (see Table 2.). Significant negative correlations were found for the relationship between class in college and

Table 2.

Simple correlations Age, Class in School and Annual Household Income with Snyder Hope Scale, Impulsivity Measures and MHI			
	1.	2.	3.
1. Age			
2. Class in School	.51**		
3. Annual Household Income	-.17*	-.04	
4. HS-R2 Goals	.08	.07	.03
5. HS-R2 Pathways	.07	.06	.04
6. HS-R2 Agency	.03	-.11	.14
7. HS-R2 Full Scale	.06	-.05	.08
8. BIS Attentional Impulsiveness	-.15	.06	.02
9. BIS Motor Impulsiveness	-.02	.04	.00
10. BIS Nonplanning Impulsiveness	-.04	.01	-.09
11. BIS Full Scale	-.08	.04	-.03
12. DII Functional Impulsivity	-.04	.01	.08
13. II Dysfunctional Impulsivity	-.03	.04	.02
14. Sensitivity to Punishment	.03	-.04	-.11
15. Sensitivity to Reward	-.13	-.01	.23**
16. MHI Anxiety	-.10	.04	-.05
17. MHI Depression	-.07	.13	-.11
18. MHI Loss of Behavioral/Emotional Control	-.05	.13	-.16*
19. MHI General Positive Affect	.02	-.18*	.13

*Correlation is significant at .05 level

** Correlation is significant at .01 level

MHI general positive affect ($r=-.18, p<.05$), and for the relationship between annual household income and MHI loss of behavioral/emotional control ($r=-.16, p<.05$).

Also, a significant positive correlation coefficient was found for the relationship between annual household income and sensitivity to reward ($r=.23, p<.01$). None of the other correlations between the demographic variables and impulsivity, hope and MHI reached significant levels. Again the demographic variables were not found to have a strong influence on the levels of hope, impulsivity and mental health issues and they were therefore not further explored during the rest of the analysis.

Correlations between hope and impulsivity measures

To measure the strengths and the directions of the associations between hope, impulsivity and mental health, simple correlations were performed between HS-R2 scales, BIS-11 scales, DII functional and dysfunctional impulsivity, SPSRQ scales, and the anxiety, depression, loss of behavioral/emotional control and general positive affect scales of the MHI (See Table 3). Significant negative correlations were obtained between overall hope and BIS-11 attentional impulsiveness, BIS-11 motor impulsiveness, BIS-11 nonplanning impulsiveness, BIS-11 full-scale, DII dysfunctional impulsivity, sensitivity to punishment, MHI anxiety, MHI depression, and MHI loss of behavioral control/emotional control. Significant positive correlations were obtained between overall hope and DII functional impulsivity and MHI general positive affect. The same pattern was found for the relationship between the HS-R2 goals, pathways and agency subscales and the impulsivity and mental health measures. The correlations between the hope scales and sensitivity to reward

Table 3.

	Simple Correlations Snyder Hope Scale, Impulsivity Measures and MHI														
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. HS-R2 Goals															
2. HS-R2 Pathways	.55**														
3. HS-R2 Agency	.78**	.65**													
4. HS-R2 Full Scale	.89**	.82**	.93**												
5. BIS Attentional Impulsiveness	-.29**	-.25**	-.37**	-.35**											
6. BIS Motor Impulsiveness	-.28**	-.17*	-.21**	-.25**	.46**										
7. BIS Nonplanning Impulsiveness	-.48**	-.39**	-.44**	-.50**	.48**	.57**									
8. BIS Full Scale	-.44**	-.34**	-.42**	-.46**	.77**	.82**	.86**								
9. DII Functional Impulsivity	.17*	.28**	.22**	.25**	.05	.30**	.04	.15							
10. DII Dysfunctional Impulsivity	-.27**	-.29**	-.26**	-.31**	.48**	.58**	.61**	.68**	.17*						
11. Sensitivity to Punishment	-.27**	-.35**	-.35**	-.37**	.16*	-.05	.10	.09	-.56**	.08					
12. Sensitivity to Reward	.04	.06	.06	.08	.32**	.38**	.17*	.34**	.34**	.37**	-.06				
13. MHI Anxiety	-.20**	-.30**	-.30**	-.29**	.43**	.18*	.16*	.31**	-.25**	.23**	.55**	.19*			
14. MHI Depression	-.35**	-.33**	-.53**	-.46**	.42**	.13	.20**	.30**	-.18*	.21**	.49**	.01	.75**		
15. MHI Loss of Behavioral/Emotional Control	-.43**	-.42**	-.53**	-.53**	.42**	.22**	.30**	.38**	-.20**	.33**	.49**	.03	.72**	.86**	
16. MHI General Positive Affect	.38**	.37**	.52**	.49**	-.37**	-.04	-.22**	-.26**	.18*	-.19*	.30**	-.01	-.61**	-.77**	-.71**

*Correlation is significant at .05 level

**Correlation is significant at .01 level

did not reach significant levels. The strongest correlations between hope and impulsivity were found for the relationship between BIS-11 nonplanning impulsiveness and the hope full-scale and subscale scores.

To control for the possibility that the associations between hope and impulsivity were the result of a mediating effect of mental health issues, correlations were run with the MHI anxiety, depression, loss of behavioral/emotional control, and general positive affects scales partialled out. Such partial correlations were performed for the relationships between HS-R2 scales, BIS-11 scales, DII functional and dysfunctional impulsivity, sensitivity to punishment, and sensitivity to reward. As can be seen from Table 4, partialing out the effects of mental health slightly reduced the size of the correlation coefficients between .02 and .26, but, most of the correlations remained highly significant. This shows that the relationship between hope and impulsivity cannot be explained simply by a shared covariance with mental health issues. The correlations that were reduced below significance levels were mostly those that were weak prior to partialing out the MHI variance.

Because a goal of this study was to determine which measures of impulsivity corresponded most strongly with hope, significance tests were conducted comparing the strength of the correlations between the various impulsivity measures and the HS-R2 full-scale scores (see Table 5). The correlation between BIS-11 full scale and HS-R2 full scale was significantly larger than the correlations between DII functional impulsivity and HS-R2 full scale, and DII dysfunctional impulsivity and HS-R2 full scale. While the correlation coefficient for the relationship between BIS-11 full scale

Table 4.

Partial Correlations Snyder Hope Scale and Impulsivity Measures with MHI Partialled out.											
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. HS-R2 Goals											
2. HS-R2 Pathways	.47**										
3. HS-R2 Agency	.72**	.59**									
4. HS-R2 Full Scale	.87**	.79**	.90**								
5. BIS Attentional Impulsiveness	-.16*	-.10	-.21**	-.18*							
6. BIS Motor Impulsiveness	-.26**	-.11	-.19**	-.22**	.44**						
7. BIS Nonplanning Impulsiveness	-.40**	-.30**	-.37**	-.42**	.44**	.56**					
8. BIS Full Scale	-.36**	-.22**	-.33**	-.36**	.75**	.82**	.85**				
9. DII Functional Impulsivity	.14	.22**	.19*	.21**	.17*	.38**	.11	.27**			
10. DII Dysfunctional Impulsivity	-.17*	-.17*	-.16**	-.20**	.42**	.55**	.57**	.64**	.27**		
11. Sensitivity to Punishment	-.14	-.19*	-.19*	-.20**	.14	-.20**	-.03	-.14	-.52**	-.10	
12. Sensitivity to Reward	.01	.08	.08	.07	.32**	.37**	.19*	.35**	.41**	.38**	-.17*

*Correlation is significant at .05 level

**Correlation is significant at .01 level

and HS-R2 full scale was slightly larger than the correlation between sensitivity to punishment and HS-R2 full scale, this difference did not reach significance.

It also was hypothesized that nonplanning impulsiveness would have a stronger relationship with hope than the two other second-order factors of the BIS-11 scale, (i.e., motor impulsiveness and attentional impulsiveness). Significance tests were conducted on the correlations between all scales of the HS-R2 and the second-order factors of the BIS-11 (see Table 5). The correlation between BIS-11 nonplanning impulsiveness and full-scale HS-R2 scores was found to be significantly stronger than the correlations between full scale HS-R2 and attentional impulsiveness, and between the full scale HS-R2 and motor impulsiveness. It also was hypothesized that the correlation between attentional impulsiveness and hope would be stronger than the correlation between motor impulsiveness and hope. However, while the obtained relationships were in the predicted direction, the difference between the correlations did not reach significance. As predicted, nonplanning impulsiveness was found to have a significantly stronger inverse correlation with hope than did the other two second-order factors of the BIS-11, but no reliable difference was found between the correlations of hope and attentional impulsiveness and hope and motor impulsiveness.

It also was hypothesized that the pathways subscale of the HS-R2 would have a stronger relationship with BIS-11 impulsivity than would the goals and the agency

Table 5.

Significance Tests for Difference between Correlations					
	Correlation 1.	Correlation 2.	Difference	t	<i>p</i>
1. BIS Full scale and HS-R2 Full Scale vs. 2. DII Functional Impulsivity and HS-R2 Full Scale	-.46 (-.36)	.25 (.21)	.21 (.15)	2.33 (1.73)	<.05 (<.10)
1. BIS Full Scale and HS-R2 Full Scale vs. 2. DII Dysfunctional Impulsivity and HS-R2 Full Scale	-.46 (-.36)	-.31 (-.20)	.15 (.16)	2.72 (3.67)	<.01 (<.001)
1. BIS Full Scale and HS-R2 Full Scale vs. 2. Sensitivity to Punishment and HS-R2 Full Scale	-.46 (-.36)	-.37 (-.20)	.09 (.10)	1.04 (1.38)	ns (ns)
1. BIS Nonplanning and HS-R2 Goals vs. 2. BIS Nonplanning and HS-R2 Pathways	-.48 (-.40)	-.39 (-.30)	.09 (.10)	0.79 (1.38)	ns ns
1. BIS Nonplanning and HS-R2 Agency vs. 2. BIS Nonplanning and HS-R2 Pathways	-.44 (-.37)	-.39 (-.30)	.05 (.07)	.87 (1.08)	ns ns
1. BIS Nonplanning and HS-R2 Full Scale vs. 2. BIS Motor and HS-R2 Full Scale	-.50 (-.42)	-.25 (-.22)	.25 (.20)	3.84 (3.03)	<.001 (<.01)
1. BIS Nonplanning and HS-R2 Full Scale vs. 2. BIS Attentional and HS-R2 Full Scale	-.50 (-.42)	-.35 (-.18)	.15 (.24)	2.21 (3.22)	<.05 (<.01)
1. BIS Nonplanning and HS-R2 Full Scale vs. 2. BIS Full Scale and HS-R2 Full Scale	-.50 (-.42)	-.46 (-.36)	.04 (.06)	1.12 (1.56)	ns ns
1. BIS Attentional and HS-R2 Full Scale vs. 2. BIS Motor and HS-R2 Full Scale	-.35 (-.18)	-.25 (-.22)	.10 (.04)	1.33 (.50)	ns ns
1. BIS Full Scale and HS-R2 Agency vs. 2. BIS Full Scale and HS-R2 Pathways	-.44 (-.33)	-.34 (-.22)	.10 (.11)	1.52 (1.66)	ns (<.10)
1. BIS Full Scale and HS-R2 Agency vs. 2. BIS Full Scale and HS-R2 Pathways	-.42 (-.36)	-.34 (-.22)	.08 (.14)	1.36 (1.88)	ns (<.10)

Significance tests for partial correlations in parenthesis.

subscales. Moreover, it was expected that this would be especially true for the relationship of HS-R2 pathways and the BIS-11 nonplanning impulsivity scale. To test for this possibility, significance tests were conducted to contrast the correlations between full scale BIS-11 scores and BIS-11 nonplanning impulsiveness scores with the three HS-R2 subscales (see Table 5). None of these differences were found to be significant.

Significance tests also were run for these relationships using the values from the partial correlations (see Table 5). While some of the *t* values changed slightly, the main relationships remained. The difference for the correlation between the full scale HS-R2 and the full scale BIS-11 and that between full scale HS-R2 and DII functional impulsivity attained only marginal significance ($p < .10$) when using the partial correlation values.

Because a curvilinear relationship was hypothesized to exist between full scale hope and SPSRQ sensitivity to punishment and sensitivity to reward, regressions for these relationships, including both quadratic and cubic terms for sensitivity to punishment and sensitivity to reward, were performed. Sensitivity to punishment and sensitivity to reward were entered as independent variables, as it was expected that these were underlying factors influencing levels of hope. Adding the quadratic term (R^2 change = .003, $p = .46$) and the cubic term (R^2 change = .00, $p = .89$) to sensitivity to reward did not have a significant effect on R^2 . There also was no significant R^2 change as a result of adding either quadratic (R^2 change = .004, $p = .40$) or cubic terms (R^2 change = .003, $p = .44$) to sensitivity to punishment. The relationships

Table 6.

MHI and Impulsivity Measures as Predictors of Hope through Hierarchical Regressions							
		Adjusted R ²	R ² change	F change	Beta	t	p
Step 1		.312		20.03			.00
	MHI Anxiety				.242	2.44	.02
	MHI Depression				-.015	-.10	.92
	MHI Loss of Behavioral Control/Emotional Control				-.495	-3.84	.00
	MHI General Positive Affect				.270	2.67	.01
Step 2		.395	.085	23.67			.00
	MHI Anxiety				.276	2.96	.00
	MHI Depression				-.057	-.42	.68
	MHI Loss of Behavioral Control/Emotional Control				-.361	-2.91	.00
	MHI General Positive Affect				.273	2.89	.00
	BIS Full Scale				-.317	-4.87	.00
Step 2		.423	.119	11.50			.00
	MHI Anxiety				.217	2.33	.02
	MHI Depression				-.091	-.68	.51
	MHI Loss of Behavioral Control/Emotional Control				-.331	-2.71	.01
	MHI Positive Affect				.229	2.40	.02
	BIS Attentional Impulsiveness				-.011	-.15	.88
	BIS Motor Impulsiveness				.017	.23	.82
	BIS Nonplanning Impulsiveness				-.368	-4.77	.00

Table 6, continued.

Step 2		.377	.071	9.62			.00
	MHI Anxiety				.313	3.27	.00
	MHI Depression				-.117	-.84	.40
	MHI Loss of Behavioral Control/Emotional Control				-.348	-2.71	.01
	MHI General Positive Affect				.255	2.65	.01
	DII Dysfunctional Impulsivity				-.235	-3.47	.00
	DII Functional Impulsivity				.230	3.52	.00
Step 2		.331	.027	3.36			.04
	MHI Anxiety				.303	2.84	.01
	MHI Depression				-.002	-.01	.99
	MHI Loss of Behavioral Control/Emotional Control				-.468	-3.67	.00
	MHI General Positive Affect				.256	2.56	.01
	Sensitivity to Punishment				-.190	-2.45	.02
	Sensitivity to Reward				.027	.41	.68

between sensitivity to reward and hope and between sensitivity to punishment and hope are therefore better explained as linear relationships.

To see how much of the variance in overall hope could be explained by the different impulsivity measures, separate hierarchical regressions were run with BIS-11 scales on hope, with DII functional and dysfunctional impulsivity on hope, and with SPSRQ sensitivity to punishment and sensitivity to reward on hope. To control for the possibility that the relationship between hope and impulsivity was due to the effects of mental health status, the MHI subscales of depression, anxiety, loss of behavioral/emotional control, and general positive affect were entered in the first step of the regressions to account for the variance explained by these scales before entering the impulsivity measures in separate second steps. Because of impulsivity's hypothesized biological underpinnings, the different impulsivity measures were entered as the independent variable while hope was entered as the dependent variable. The results for these regressions are presented in Table 6. Even after factoring out the variance explained by mental health issues, all the different measures of impulsivity explained significant amounts of the variance in hope. The BIS-11 accounted for the largest amount of variance in hope, with most of this being due to the effect of nonplanning impulsivity.

Discussion

This study revealed a strong relationship between impulsivity and hope. As hypothesized, hope was inversely correlated with scores on the BIS-11, the broad-based measure of impulsivity. Higher levels of impulsivity were associated with

lower levels of hope. Also as predicted, this inverse relationship was strongest between hope and the BIS-11 second-order factor of nonplanning impulsiveness. As the significance tests show, this relationship was stronger than the relationships between hope and BIS-11 attentional impulsiveness and BIS-11 motor impulsiveness. Nonplanning impulsiveness has been defined as a lack of planning for the future and difficulties with careful thinking (Patton et al., 1995), whereas the ability to plan and to have the motivation to pursue goals are definitional components of hope.

Nonplanning impulsiveness was not found to have a significantly stronger inverse correlation with the pathways subscale of the Snyder Hope Scale than with the goals and the agency subscales. Actually, the goals and agency subscales had a slightly stronger correlation with nonplanning impulsiveness and the other BIS-11 scales, although these differences did not reach statistically significant levels. While it might seem that nonplanning impulsiveness would have its strongest relationship with the pathways component of hope which is, by definition, a belief in one's capacity to find ways to reach goals, it is important to note that pathways thinking implicates belief in one's ability to create pathways, not one's actual skill in creating them (Snyder, Irving, et al., 1991). Theoretically, pathways thinking should come into play only after a goal and the motivation to work toward it are in place (Snyder, 2002). Patton et al. (1995) describe people high on nonplanning impulsiveness as having such a strong present orientation that they are largely unable to consider the future and, by logical inference, to entertain future-oriented goals and the motivation to

achieve them. Comparatively speaking, then, the impact of nonplanning impulsiveness on the pathways component of hopeful thinking should be indirect.

Also as predicted, the two remaining BIS-11 second-order factors had inverse correlations with hope, with the relationship between attentional impulsiveness and hope being slightly stronger than the relationship between motor impulsiveness and hope. However, this difference did not reach significance. People high in attentional impulsiveness are described as having difficulties with focusing on tasks and having problems with racing thoughts (Patton et al., 1995), making it difficult to focus on goal pursuits. People high in motor impulsiveness are described as making quick decisions and living an inconsistent lifestyle (Patton et al., 1995). This could be detrimental for long term goal pursuit, but it is likely that the effect might be less direct than that seen for nonplanning impulsiveness.

It was originally hypothesized that there would be curvilinear relationships between hope and sensitivity to punishment and between hope and sensitivity to reward. This hypothesis was not supported. Instead, the results show a linear trend for both relationships, with a significant negative correlation between hope and sensitivity to punishment and a non-significant positive correlation between hope and sensitivity to reward. The curvilinear relationship was predicated on the assumption that a medium level of BIS and BAS activation would be preferable in goal pursuit situations and that too high levels of activation in either system could be detrimental to goal attainment. It also was suggested that an awareness and realistic evaluation of both rewards and punishments would be required for high hope.

A possible explanation for the lack of support for the hypothesis concerning hope and sensitivity to punishment is that sensitivity to punishment is not strictly based on awareness of the chance of possible punishments but, rather, on the possibility of punishments having an inhibiting effect (Torrubia et al., 2000). The negative correlation between hope and this factor would then mean that the higher one is in hope the less likely one is to be inhibited by possible punishments. High-hope people might be aware of the possibility of punishments, but do not let this possibility inhibit them from trying to reach their goals. Low-hope people, on the other hand, might be inhibited by the possibility of punishment during goal pursuits

The non-significant relationship between hope and sensitivity to reward might be an artifact of the formulation of the questions on the SPSRQ. Most of the questions for the sensitivity to reward scale are related to shorter term and social rewards such as attention. Although high-hope people should have no difficulty finding the motivation to obtain rewards, the rewards they strive for often will be long-term ones where too much motivation towards short-term rewards might be distracting. It also has been hypothesized that high-hope people often use intrinsic rewards to motivate themselves and that such extrinsic rewards as praise and attention are not as important for them (Snyder, Lopez, Shorey, Rand, & Feldman, 2003). Many of the reward situations listed in the SPSRQ might therefore be relatively unimportant for high-hope people. This would not be an indication that these individuals are averse to rewards but, rather, that they are activated by different kinds of rewards. Low-hope people, on the other hand, may have problems with reward activation in general,

either not being sufficiently activated by them or being discouraged due to a lack of success in reaching their goals. Similarly, while they might want the attention and praise from others, they might not be sufficiently motivated by it due to fears of failure.

In line with predictions, a significant positive correlation was found between hope and functional impulsivity, while a significant negative correlation was found between hope and dysfunctional impulsivity. Functional impulsivity, the ability to quickly process information and make decisions (Dickman, 1990), would likely be related to successful goal attainment in many situations and might enable individuals to capitalize on opportunities that come their way. As this could be advantageous in goal pursuit situations, it also is likely to relate positively to higher hope. Low-hope people, conversely, might be comparatively unable to make the most of their opportunities or be inhibited or slowed down by insecurity or uncertainty about what goals to strive for.

Dysfunctional impulsivity, on the other hand, is described as a difficulty inhibiting dominant responses, even when these are counterproductive, or acting without forethought (Dickman, 1990). Such a trait would likely be detrimental to the attainment of short- as well as long-term goals, contributing to the development of lower levels of hope. Level of hope is likely to be affected by previous successful goal pursuits and traits that might hinder such success theoretically should produce lower hope levels (Snyder, 2002).

As expected based on previous studies on hope and impulsivity, both were found to be highly correlated with mental health issues. In previous research, higher hope has been linked to better mental functioning and a lower incidence of such mental health issues as depression and anxiety (Snyder, Harris, et al., 1991), and this pattern held in the current study. High levels of impulsivity, in contrast, have been linked to greater susceptibility to mental health problems (Moeller, et al., 2001), a trend that also was found in the current study. Prior to the current study, we deemed it possible that any correlation between hope and impulsivity might result from the third variable of mental health. Although mental health issues had a partial mediating effect on the relationship between hope and impulsivity, partialing out this effect still left a strong relationship between hope and impulsivity. For example, the correlation between overall hope and the BIS-11 full-scale score was .35 even after the effects of mental health were partialled out. Accordingly, the relationship between hope and impulsivity does not appear to be an artifact of their both being highly related to mental health issues.

In the current study, the strongest correlations between overall hope and overall impulsivity were found for the relationships between hope full scale and scores on the Barratt Impulsiveness Scale-11. This correlation with hope was reliably stronger than those between hope and DII functional and DII dysfunctional impulsivity. Although the correlation between hope and sensitivity to punishment was smaller than that between hope and the BIS-11 full scale scores, this difference did not reach significance. The BIS-11 is based on a multi-theoretical framework of

impulsivity and should therefore cover many different aspects of the impulsivity construct. Of these aspects, it was nonplanning impulsiveness, in particular, that showed a strong negative correlation with hope. The hierarchical regression of the BIS-11 second-order factors on hope also revealed that the largest part of the relationship between overall BIS-11 scores and hope resulted from the relationship between hope and nonplanning impulsiveness. Apart from this strong correlation, it is difficult to say which impulsivity model provides the best link with hope. Rather, it seems that all of them provide useful information and all of them explain significant amounts of the variance in hope even beyond that related to a shared relationship to mental health.

So, how can the relationship between hope and impulsivity elucidate the hope construct? As mentioned above, many elements of impulsivity, such as an inability to consider the future when making decisions, can derail goal pursuits. Previous success or lack thereof is, in turn, an important influence on one's current and future levels of hope. In contrast with impulsivity, which appears to be a biologically-based personality trait with a strong genetic loading (Eysenck, 1982), levels of hope are thought to be influenced by such factors as family upbringing, attachment, and goal attainment throughout the life cycle (Snyder, 2000). Impulsivity is important for decision making and goal attainment throughout a person's development, all along serving as an important factor in the development of hope. To the extent that high levels of impulsivity are detrimental to goal attainment, it is likely to also lead to lower levels of hope, a possibility that is supported by the current findings.

Impulsivity might provide explanations for the negative relationships between hope and such factors as drug abuse, criminality, mental disorders, and gambling, all of which are positively associated with impulsivity (Hayaki, et al., 2005; Moeller, et al., 2001; Nasser, et al., 2004; Nower, et al., 2004). Several studies also have linked impulsivity to patterns of activation in the brain and to possible differential brain development (e.g. Barratt, Pritchard, Faulk, & Brandt, 1987; Harmon-Jones, Barratt, & Wigg, 1997). Such findings for impulsivity may provide a fertile arena for the search for the possible neurological foundations of hope.

Study Limitations

Although attempts were made to make the study and the results as unbiased as possible, certain limitations should be mentioned. A main limitation was the fact that self report measures were the only form of data collected. Because of shared method variance, the use of self report measures of impulsivity also might have inflated the correlations with hope somewhat. While studies show that self report measures of impulsivity correlate well with behavioral measures of impulsivity (Moeller, Dougherty, Barratt, et al., 2002), future studies on the relationship between hope and impulsivity should also include behavioral measures of impulsivity.

An additional possible limitation was the yes/no answer format of the SPSRQ and the true/false answer format of the DII. These formats limit the range of answers and might force participants to settle on answer choices that might not feel correct for them. There was a slight indication of this in the current sample as the participant that was deleted from the final sample was deleted due to a large number of the answers

being placed between the yes and no, and true and false options. Again, previous studies using these instruments have not mentioned this as a limitation (Dickman, 1990; Torrubia, et al., 2001) and there were strong positive correlations between participants' score on the DII and the SPSRQ and the BIS-11 which uses a four-point Likert scale.

A third limitation of the current study was the use of a college example. Although most studies show that college students are representative of the population as a whole, there is always a question of how generalizable college student data are to that of other groups. One specific concern for the current study is the link between impulsivity and drug use (e.g. Moeller, Dougherty, Steinberg, et al., 2002), as studies show that drug use is more prevalent among young adults than other age groups. The use of stimulants, in particular, might be more prevalent among college students than among other groups (SAMSHA, 2007). Future studies should include questions concerning drug and alcohol use to control for or measure the effect of this on the relationship between hope and impulsivity.

Finally, the current study might have benefited from the use of a Structural Equation Modeling analysis. SEM allows for additional corrections for measurement error, which would mean that many of the correlations might increase, possibly resulting in additional correlations reaching statistical significance. An SEM analysis also would make it possible to look at the relationship between the latent variables of hope and impulsivity and not just the measured variables, which would give additional information about the relationship.

Conclusions

The current study uncovered a strong link between level of impulsivity and level of hope, with higher impulsivity being related to lower levels of hope. Impulsivity is usually viewed as an innate trait, and may be a possible causal factor in the development of an individual's level of hope. Future studies should explore the relationship between hope and impulsivity further, using the relationship to extend our knowledge of hope into such areas as criminal justice and substance dependence.

References

- Anderson, J. R. (1988). *The role of hope in appraisal, goal-setting, expectancy, and coping*. Unpublished doctoral dissertation, University of Kansas, Lawrence.
- Barratt, E. S. (1965). Factor analysis of some psychometric measures of impulsiveness and Anxiety. *Psychological Reports*, 16, 547-554.
- Barratt, E. S., & Stanford, M. S. (1995). Impulsiveness. In C. G. Costello (Ed.), *Personality Characteristics of the personality disordered* (pp. 91-119). New York: Wiley.
- Barratt, E. S., Pritchard, W. S., Faulk, D. M., & Brandt, M. E. (1987). The relationship between Impulsiveness, trait anxiety, and visual N100 augmenting/reducing: A topographic Analysis. *Personality and Individual Differences*, 8, 43-51.
- Bechara, A., & Damasio, H. (2002). Decision-making and addiction (Part I): Impaired activation of somatic states in substance dependent individuals when pondering decisions with negative future consequences. *Neuropsychologia*, 40, 1675-1689.
- Brunas-Wagstaff, J., Bergquist, A., & Wagstaff, G. F. (1994). Cognitive correlates of functional and dysfunctional impulsivity. *Personality and Individual Differences*, 17, 289-292.
- Cattell, R. B. (1979). *Personality and learning theory; Volume 1: The structure of personality in its environment*. New York: Springer Publishing Company.

- Chico, E., Tous, J. M., Lorenzo-Seva, U., & Vigil-Colet, A. (2003). Spanish adaptation of Dickman's Impulsivity inventory: Its relationship to Eysenck's personality questionnaire. *Personality and Individual Differences, 35*, 1883-1892.
- Davies, A. R., Sherbourne, C. D., Peterson, J. R., & Ware, J. E., Jr. (1988). *Scoring manual: Adult health status and patient satisfaction measures in RAND's health insurance experiment* (pp. 47-81). Santa Monica, CA: The RAND Corporation.
- Dickman, S. (1990). Functional and dysfunctional impulsivity: Personality and cognitive correlates. *Journal of Personality and Social Psychology, 58*, 95-102.
- Eaves, L. J., Eysenck, H. J., & Martin, N. G. (1989). *Genes, culture and personality*. London: Academic Press.
- Eysenck, H. J. (1952). *The scientific study of personality*. Westport, CT: Greenwood Press.
- Eysenck, H. J. (1982). *Personality, genetics, and behavior: Selected papers*. New York: Praeger.
- Eysenck, H. J. & Eysenck, S. B. G. (1976). *Psychoticism as a dimension of personality*. London: Hodder & Stoughton.
- Eysenck, S. B. G., & Eysenck, H. J. (1971). Crime and personality: Item analysis of questionnaire responses. *British Journal of Criminology, 11*, 49-62.

- Eysenck, S. B. G., & Eysenck, H. J. (1977). The place of impulsiveness in a dimensional system of personality description. *British Journal of Social and Clinical Psychology*, 16, 57-68.
- Fossati, A., Di Ceglie, A., Acquarini, E., & Barratt, E. S. (2001). Psychometric properties of an Italian version of the Barratt Impulsiveness Scale-11 (BIS-11) in nonclinical subjects. *Journal of Clinical Psychology*, 57, 815-828.
- Fowles, D. C. (1993). Biological variables in psychopathology: A psychobiological perspective. In P. B. Sutker & H. E. Adams (Eds.), *Comprehensive handbook of psychopathology* (2nd ed., pp 57-82). New York: Plenum.
- Franken, I. H. A., Muris, P., & Georgieva, I. (2006). Gray's model of personality and addiction. *Addictive Behaviors*, 31, 399-403.
- George, D., & Mallery, P. (1999). *SPSS for Windows step by step: A simple guide and reference*. Boston, MA: Allyn & Bacon.
- Gray, J. A. (1981). The psychophysiology of anxiety. In R. Lynn (Ed.), *Dimensions of personality: Papers in honour of H. J. Eysenck* (pp.233-252). New York: Pergamon Press.
- Gray, J. A. (1982). *The neuropsychology of anxiety: An enquiry into the functions of the septo-hippocampal system*. Oxford: Oxford University Press.
- Gray, J. A. (1990). Brain systems that mediate both emotion and cognition. *Cognition and Emotion*, 4, 269-288.

- Harmon-Jones, E., Barratt, E. S., & Wigg, C. (1997). Impulsiveness, aggression, reading, and the P300 of the event-related potential. *Personality and Individual Differences*, 22, 439-445.
- Hayaki, J., Stein, M. D., Lessor, J. A., Herman, D. S., & Anderson, B. J. (2005). Adversity among drug users: Relationship to impulsivity. *Drug and Alcohol Dependence*, 78, 65-71.
- Heaven, P. (1991). Personality correlates of functional and dysfunctional impulsiveness. *Personality and Individual Differences*, 12, 1213-1217.
- Heckel, R. V., Allen, S. S., Andrews, L., Roeder, G., Ryba, P., & Zook, W. (1989). Normative data on the Kagan Matching Familiar Figures Test for adult male incarcerates. *Journal of Clinical Psychology*, 45, 155-160.
- Irving, L. M., Snyder, C. R., & Crowson, J. J., Jr. (1998). Hoping and coping with cancer by college women. *Journal of Personality*, 66, 195-214.
- Kagan, J. (1966). Reflection-impulsivity: The generality and dynamics of conceptual tempo. *Journal of Abnormal Psychology*, 71, 17-24.
- Kwon, P. (2002). Hope, defense mechanisms, and adjustment: Implications for false hope and defensive hopelessness. *Journal of Personality*, 70, 207-231.
- Langelle, C. (1989). *An assessment of hope in a community sample*. Unpublished master's thesis, University of Kansas, Lawrence.
- Martin, L. E., & Potts, G. F. (2004). Reward sensitivity in impulsivity. *Neuroreport*, 15, 1519-1522.

- Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C. (2001). Psychiatric aspects of impulsivity. *American Journal of Psychiatry*, 158, 1783-1793.
- Moeller, F. G., Dougherty, D. M., Barratt, E. S., Oderinde, V., Mathias, C. W., Harpre, R. A., & Swann, A. C. (2002). Increased impulsivity in cocaine dependent subjects independent of antisocial personality disorder and aggression. *Drug and Alcohol Dependence*, 68, 105-111.
- Moeller, F. G., Dougherty, D. M., Steinberg, J. L., Swann, A. C., Silverman, P. B., Ruiz, P., & Barratt, E. S. (2002). Heavy "Ecstasy" use is associated with increased impulsivity. *Addictive Disorders and Their Treatment*, 1, 47-52.
- Nasser, J. A., Gluck, M. E., & Geliebter, A. (2004). Impulsivity and test meal intake in obese binge eating women. *Appetite*, 43, 303-307.
- Nower, L., Derevensky, J. L., & Gupta, R. (2004). The relationship of impulsivity, sensation seeking, coping, and substance use in youth gamblers. *Psychology of Addictive Behaviors*, 18, 49-55.
- Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt Impulsiveness Scale. *Journal of Clinical Psychology*, 51, 768-774.
- Petry, N. M. (2001). Substance abuse, pathological gambling, and impulsiveness. *Drug and Alcohol Dependence*, 63, 29-38.
- Quay, H. C. (1988). The behavioral reward and inhibition system in childhood behavior disorders. In L. M. Bloomingdale (Ed.) *Attention Deficit Disorder* (Vol. 3, pp. 176-186). Elmsford, NY: Pergamon Press.

- Schweizer, K. (2002). Does impulsivity influence performance in reasoning?
Personality and Individual Differences, 33, 1031-1043.
- Smillie, L. D., & Jackson, C. J. (2006). Functional impulsivity and reinforcement sensitivity theory. *Journal of Personality*, 74, 47-83.
- Snyder, C. R. (1994). *The psychology of hope: You can get there from here*. New York: Free Press.
- Snyder, C. R. (1999). Hope, goal blocking thoughts, and test-related anxieties. *Psychological Reports*, 84, 206-208.
- Snyder, C. R. (2000). *Handbook of Hope: Theory, measures, and applications*. San Diego, CA: Academic.
- Snyder, C. R. (2002). Hope theory: Rainbows in the Mind. *Psychological Inquiry*, 13, 249-275.
- Snyder, C. R., & Fromkin, H. (1980). *Uniqueness: The human pursuit of difference*. New York: Plenum.
- Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S.A., Irving, L. M., Sigmon, S.T., et al. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology*, 60, 570-585.
- Snyder, C. R., Irving, L., & Anderson, J. R. (1991). Hope and health: Measuring the will and the ways. In C. R. Snyder & D. R. Forsyth (Eds.), *Handbook of social and clinical psychology: The health perspective* (pp. 285-305). Elmsford, NY: Pergamon.

- Snyder, C. R., LaPointe, A. B., Crowson Jr., J. J., & Early, S. (1998). Preferences of high- and low-hope people for self-referential input. *Cognition and Emotion*, 12, 807-823.
- Snyder, C. R., Lehman, K. A., Kluck, B., & Monsson, Y. (2006). Hope for rehabilitation and vice versa. *Rehabilitation Psychology*, 51, 89-112.
- Snyder, C. R., Lopez, S. J., Shorey, H. S., Rand, K. L., & Feldman, D. B. (2003). Hope theory, measurements, and applications to school psychology. *School Psychology Quarterly*, 18, 122-139.
- Snyder, C. R., Shorey, H. S., Cheavens, J., Pulvers, K. M., Adams III, V. H., & Wiklund, C. (2002). Hope and academic success in college. *Journal of Educational Psychology*, 94, 820-826.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2002). *National survey on drug use and health* [On-line]. Available: <http://www.oas.samhsa.gov/nhsda.htm>
- Torrubia, R., Àvila, C., Moltó, J., & Caseras, X. (2001). The Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ) as a measure of Gray's anxiety and impulsivity dimensions. *Personality and Individual Differences*, 31, 837-862.
- Veit, C. T., & Ware, J. E. (1983). The structure of psychological distress and well-being in general populations. *Journal of Consulting and Clinical Psychology*, 51, 730-742.

Wallace, J. F., & Newman, J. P. (1990). Differential effects of reward and punishment cues on response speed in anxious and impulsive individuals.

Personality and Individual Differences, 11, 999-1009.

Yoshinobu, L. R. (1989). *Construct validation of the Hope Scale: Agency and pathways components*. Unpublished master's thesis, University of Kansas,

Lawrence.

Appendix A

The Snyder Hope Scale (HS-R2)

SHS

Directions: Read each item carefully. For each item, please select the option that best describes YOU and circle that option.

1. I have trouble getting what I want in life

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

2. I clearly define the goals that I pursue

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

3. I can think of many ways to get out of a jam

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

4. I have many goals that I am pursuing

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

5. I prefer easy goals over hard goals

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

6. I have what it takes to get the job done

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

7. I have difficulty finding ways to solve problems

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

8. I give up easily

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

9. I'm not good at coming up with solutions

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

10. I'm good at coming up with new ways to solve problems

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

11. I create alternate plans when blocked

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

12. I do not try hard enough to overcome challenges

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

13. I go after goals that are difficult and challenging

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

14. I do not care about the goals I am pursuing

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

15. It is difficult to find ways to get what I want

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
---------------------	-----------------	-------------------	-------------------	------------------	------------------	----------------	--------------------

16. As long as I have a chance, I'll keep trying

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
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17. I cannot come up with new goals

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
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18. I'm not very motivated

Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True
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Appendix B

Barratt Impulsiveness Scale-11 (BIS-11)

<p>DIRECTIONS: People differ in the ways they act and think in different situations. This is a test to measure some of the ways in which you act and think. Read each statement and put an X on the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer quickly and honestly.</p>				
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Rarely/Never	Occasionally	Often	Almost Always/Always	
1 I plan tasks carefully.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I do things without thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I make-up my mind quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 I am happy-go-lucky.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 I don't "pay attention."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 I have "racing" thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 I plan trips well ahead of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 I am self controlled.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 I concentrate easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 I save regularly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 I "squirm" at plays or lectures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 I am a careful thinker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 I plan for job security.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14 I say things without thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15 I like to think about complex problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16 I change jobs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17 I act "on impulse."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18 I get easily bored when solving thought problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19 I act on the spur of the moment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20 I am a steady thinker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21 I change residences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22 I buy things on impulse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23 I can only think about one thing at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24 I change hobbies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25 I spend or charge more than I earn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26 I often have extraneous thoughts when thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27 I am more interested in the present than the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28 I am restless at the theater or lectures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29 I like puzzles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30 I am future oriented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C

Dickman Impulsivity Inventory

DIRECTIONS: Read each item carefully. Please select the answer that best describes you and put an X in the appropriate circle on the right side of the page. Do not spend too much time on any statement. Answer quickly and honestly.	True	False
1. Often, I don't spend enough time thinking over a situation before I act.	<input type="radio"/>	<input type="radio"/>
2. I try to avoid activities where you have to act without much time to think first.	<input type="radio"/>	<input type="radio"/>
3. I don't like to make decisions quickly, even simple decisions, such as choosing what to wear, or what to have for dinner.	<input type="radio"/>	<input type="radio"/>
4. I enjoy working out problems slowly and carefully.	<input type="radio"/>	<input type="radio"/>
5. I am good at taking advantage of unexpected opportunities, where you have to do something immediately or lose your chance.	<input type="radio"/>	<input type="radio"/>
6. I would enjoy working at a job that required me to make a lot of split-second decisions.	<input type="radio"/>	<input type="radio"/>
7. I often make up my mind without taking the time to consider the situation from all angles.	<input type="radio"/>	<input type="radio"/>
8. I have often missed out on opportunities because I couldn't make up my mind fast enough.	<input type="radio"/>	<input type="radio"/>
9. I often say and do things without considering the consequences.	<input type="radio"/>	<input type="radio"/>
10. I frequently make appointments without thinking about whether I will be able to keep them.	<input type="radio"/>	<input type="radio"/>
11. I am uncomfortable when I have to make up my mind rapidly.	<input type="radio"/>	<input type="radio"/>
12. I don't like to do things quickly, even when I am doing something that is not very difficult.	<input type="radio"/>	<input type="radio"/>
13. I frequently buy things without thinking about whether or not I can really afford them.	<input type="radio"/>	<input type="radio"/>
14. I'm good at careful reasoning.	<input type="radio"/>	<input type="radio"/>
15. I like to take part in really fast-paced conversations, where you don't have much time to think before you speak.	<input type="radio"/>	<input type="radio"/>

16. I like sports and games in which you have to choose your next move very quickly.	<input type="radio"/>	<input type="radio"/>
17. Many times the plans I make don't work out because I haven't gone over them carefully enough in advance.	<input type="radio"/>	<input type="radio"/>
18. I often get into trouble because I don't think before I act.	<input type="radio"/>	<input type="radio"/>
19. Most of the time, I can put my thoughts into words very rapidly.	<input type="radio"/>	<input type="radio"/>
20. People have admired me because I can think quickly.	<input type="radio"/>	<input type="radio"/>
21. I will often say whatever comes into my head without thinking first.	<input type="radio"/>	<input type="radio"/>
22. Before making any important decisions, I carefully weigh the pros and cons.	<input type="radio"/>	<input type="radio"/>
23. I rarely get involved in projects without first considering the potential problems.	<input type="radio"/>	<input type="radio"/>

Appendix D

The Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ)

DIRECTIONS: Read each item carefully. Please select the answer that best describes you and put an X in the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer quickly and honestly.	Yes	No
1. Do you often refrain from doing something because you are afraid of it being illegal?	<input type="radio"/>	<input type="radio"/>
2. Does the good prospect of obtaining money motivate you strongly to do some things?	<input type="radio"/>	<input type="radio"/>
3. Do you prefer not to ask for something when you are not sure you will obtain it?	<input type="radio"/>	<input type="radio"/>
4. Are you frequently encouraged to act by the possibility of being valued in your work, in your studies, with your friends or with your family?	<input type="radio"/>	<input type="radio"/>
5. Are you often afraid of new or unexpected situations?	<input type="radio"/>	<input type="radio"/>
6. Do you often meet people that you find physically attractive?	<input type="radio"/>	<input type="radio"/>
7. Is it difficult for you to telephone someone you do not know?	<input type="radio"/>	<input type="radio"/>
8. Do you like to take some drugs because of the pleasure you get from them?	<input type="radio"/>	<input type="radio"/>
9. Do you often renounce your rights when you know you can avoid a quarrel with a person or an organization?	<input type="radio"/>	<input type="radio"/>
10. Do you often do things to be praised?	<input type="radio"/>	<input type="radio"/>
11. As a child, were you troubled by punishments at home or in school?	<input type="radio"/>	<input type="radio"/>
12. Do you like being the centre of attention at a party or a social meeting?	<input type="radio"/>	<input type="radio"/>
13. In tasks that you are not prepared for, do you attach great importance to the possibility of failure?	<input type="radio"/>	<input type="radio"/>
14. Do you spend a lot of your time on obtaining a good image?	<input type="radio"/>	<input type="radio"/>
15. Are you easily discouraged in difficult situations?	<input type="radio"/>	<input type="radio"/>
16. Do you need people to show their affection for you all the time?	<input type="radio"/>	<input type="radio"/>
17. Are you a shy person?	<input type="radio"/>	<input type="radio"/>
18. When you are in a group, do you try to make your opinions the most intelligent or the funniest?	<input type="radio"/>	<input type="radio"/>

19. Whenever possible, do you avoid demonstrating your skills for fear of being embarrassed?	O	O
20. Do you often take the opportunity to pick up people you find attractive?	O	O
21. When you are with a group, do you have difficulties selecting a good topic to talk about?	O	O
22. As a child did you do a lot of things to get people's approval?	O	O
23. Is it often difficult for you to fall asleep when you think about things you have done or must do?	O	O
24. Does the possibility of social advancement, move you to action, even if this involves not playing fair?	O	O
25. Do you think a lot before complaining in a restaurant if your meal is not well prepared?	O	O
26. Do you generally give preference to those activities that imply an immediate gain?	O	O
27. Would you be bothered if you had to return to a store when you noticed you were given the wrong change?	O	O
28. Do you often have trouble resisting temptation or doing forbidden things?	O	O
29. Whenever you can, do you avoid going to unknown places?	O	O
30. Do you like to compete and do everything you can to win?	O	O
31. Are you often worried by things that you said or did?	O	O
32. Is it easy for you to associate tastes and smells to very pleasant events?	O	O
33. Would it be difficult for you to ask your boss for a raise (salary increase)?	O	O
34. Are there a large number of objects or sensations that remind you of pleasant events?	O	O
35. Do you generally try to avoid speaking in public?	O	O
36. When you start to play with a slot machine, is it often difficult for you to stop?	O	O
37. Do you, on a regular basis, think that you could do more things if it was not for your insecurity or fear?	O	O
38. Do you sometimes do things for quick gains?	O	O
39. Comparing yourself to people you know, are you afraid of many things?	O	O
40. Does your attention easily stray from your work in the presence of an attractive stranger?	O	O

41. Do you often find yourself worrying about things to the extent that performance in intellectual abilities is impaired?	<input type="radio"/>	<input type="radio"/>
42. Are you interested in money to the point of being able to do risky jobs?	<input type="radio"/>	<input type="radio"/>
43. Do you often refrain from doing something you like in order not to be rejected or disapproved of by others?	<input type="radio"/>	<input type="radio"/>
44. Do you like to put competitive ingredients in all of your activities?	<input type="radio"/>	<input type="radio"/>
45. Generally, do you pay more attention to threats than to pleasant events?	<input type="radio"/>	<input type="radio"/>
46. Would you like to be a socially powerful person?	<input type="radio"/>	<input type="radio"/>
47. Do you often refrain from doing something because of your fear of being embarrassed?	<input type="radio"/>	<input type="radio"/>
48. Do you like displaying your physical abilities even though this may involve danger?	<input type="radio"/>	<input type="radio"/>

Appendix E

The Mental Health Inventory (MHI)

These questions that follow are about how you feel, and how things have been with you mostly **WITHIN THE PAST MONTH**. For each question, please circle a number for the **ONE ANSWER** that comes **CLOSEST** to the way you have been feeling.

1. How happy, satisfied, or pleased have you been with your personal life during the past month?

(Circle one. Do not skip this first item.)

1..... *Extremely happy, could not have been more satisfied or pleased*

2..... Very happy most of the time

3..... Generally satisfied, pleased

4..... Sometimes fairly satisfied, sometimes fairly unhappy

5..... Generally dissatisfied, unhappy

6..... Very dissatisfied, unhappy most of the time

2. How much of the time have you felt lonely during the past month?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

3. How often did you become nervous or jumpy when faced with excitement or unexpected situations during the past month?

1	2	3	4	5	6
Always	Very often	Fairly often	Sometimes	Almost never	Never

4. During the past month, how much of the time have you felt that the future looks hopeful and promising?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

5. How much of the time, during the past month, has your daily life been full of things that were interesting to you?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

6. How much of the time, during the past month, did you feel relaxed and free of tension?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

7. During the past month, how much of the time have you generally enjoyed the things you do?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

8. During the past month, have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel or of your memory?
- | | |
|--|---|
| No, not at all..... | 1 |
| Maybe a little..... | 2 |
| Yes, but not enough to be concerned or worried about it..... | 3 |
| Yes, and I have been a little concerned..... | 4 |
| Yes, and I am quite concerned..... | 5 |
| Yes, and I am very much concerned about it..... | 6 |
9. Did you feel depressed during the past month?
- | | |
|--|---|
| Yes, to the point that I did not care about anything for days at a time..... | 1 |
| Yes, very depressed almost every day..... | 2 |
| Yes, quite depressed several times..... | 3 |
| Yes, a little depressed now and then..... | 4 |
| No, never felt depressed at all..... | 5 |
10. During the past month, how much of the time have you felt loved and wanted?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
11. How much of the time, during the past month, have you been a very nervous person?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
12. When you got up in the morning, this past month, about how often did you expect to have an interesting day?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |
13. During the past month, how much of the time have you felt tense or "high-strung"?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
14. During the past month, have you been in firm control of your behavior, thoughts, emotions, feelings?
- | | |
|--------------------------------------|---|
| Yes, very definitely..... | 1 |
| Yes, for the most part..... | 2 |
| Yes, I guess so..... | 3 |
| No, not too well..... | 4 |
| No, and I am somewhat disturbed..... | 5 |
| No, and I am very disturbed..... | 6 |
15. During the past month, how often did your hands shake when you tried to do something?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |
16. During the past month, how often did you feel that you had nothing to look forward to?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |

17. How much of the time, during the past month, have you felt calm and peaceful?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
18. How much of the time, during the past month, have you felt emotionally stable?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
19. How much of the time, during the past month, have you felt downhearted and blue?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
20. How often have you felt like crying, during the past month?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |
21. During the past month, how often did you feel that others would be better off if you were dead?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |
22. How much of the time, during the past month, were you able to relax without difficulty?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
23. During the past month, how much of the time did you feel that your love relationships, loving and being loved, were full and complete?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |
24. How often, during the past month, did you feel that nothing turned out for you the way you wanted it to?
- | | | | | | |
|--------|------------|--------------|-----------|--------------|-------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Always | Very often | Fairly often | Sometimes | Almost never | Never |
25. How much have you been bothered by nervousness, or your "nerves," during the past month?
- | | | |
|--|---|---|
| | Extremely so, to the point where I could not take care of things..... | 1 |
| | Very much bothered..... | 2 |
| | Bothered quite a bit by nerves..... | 3 |
| | Bothered some, enough to notice..... | 4 |
| | Bothered just a little by nerves..... | 5 |
| | Not bothered at all by this..... | 6 |
26. During the past month, how much of the time has living been a wonderful adventure for you?
- | | | | | | |
|-----------------|------------------|------------------------|------------------|----------------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of the time | Most of the time | A good bit of the time | Some of the time | A little of the time | None of the time |

27. How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?

1	2	3	4	5	6
Always	Very often	Fairly often	Sometimes	Almost never	Never

28. During the past month, did you ever think about taking your own life?

Yes, very often.....	1
Yes, fairly often.....	2
Yes, a couple of times.....	3
Yes, at one time.....	4
No, never.....	5

29. During the past month, how much of the time have you felt restless, fidgety, or impatient?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

30. During the past month, how much of the time have you been moody or brooded about things?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

31. How much of the time, during the past month, have you felt cheerful, light-hearted?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

32. During the past month, how often did you get rattled, upset, or flustered?

1	2	3	4	5	6
Always	Very often	Fairly often	Sometimes	Almost never	Never

33. During the past month, have you been anxious or worried?

<i>Yes, extremely so, to the point of being sick or almost sick....</i>	1
Yes, very much so.....	2
Yes, quite a bit.....	3
Yes, some, enough to bother me.....	4
Yes, a little bit.....	5
No, not at all.....	6

34. During the past month, how much of the time were you a happy person?

1	2	3	4	5	6
All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

35. How often during the past month did you find yourself having difficulty trying to calm down?

1	2	3	4	5	6
Always	Very often	Fairly often	Sometimes	Almost never	Never

36. During the past month, how much of the time have you been in low or very low spirits?
- | | | | | | |
|--------------------|---------------------|---------------------------|---------------------|-------------------------|---------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| All of
the time | Most of
the time | A good bit
of the time | Some of
the time | A little of
the time | None of
the time |
37. How often, during the past month, have you been waking up feeling fresh and rested?
- | | |
|-----------------------------------|---|
| Always, every day..... | 1 |
| Almost every day..... | 2 |
| Most days..... | 3 |
| Some days, but usually not..... | 4 |
| Hardly ever..... | 5 |
| Never wake up feeling rested..... | 6 |
38. During the past month, have you been under or felt you were under any strain, stress, or pressure?
- | | |
|--|---|
| Yes, almost more than I could stand or bear..... | 1 |
| Yes, quite a bit of pressure..... | 2 |
| Yes, some, more than usual..... | 3 |
| Yes, some, but about normal..... | 4 |
| Yes, a little bit..... | 5 |
| No, not at all..... | 6 |