RESOLVING THE RELATIONSHIP BETWEEN PATHOLOGICAL GAMBLING AND SENSATION SEEKING

by

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(Under the Direction of Adam S. Goodie)

ABSTRACT

Research investigating the relationship between gambling and sensation seeking is very divided and has yet to identify whether pathological gamblers (PGs) are more or less sensation seeking than nonpathological gamblers (NPGs). Sensation seeking is usually gauged according to the Zuckerman, Eysenck, and Eysenck (1978) Sensation Seeking Scale form V (SSS-V). While previous studies relied on the SSS-V total score to draw conclusions regarding sensation seeking behavior, the current paper uses 2 studies to show the importance of the SSS-V subscales, which include Thrill and Adventure Seeking (TA), Experience Seeking (ES), Disinhibition (DS), and Boredom Susceptibility (BS), in judging levels of sensation seeking. Results from the current study as well as previous literature are used to support the notion that the SSS-V can be divided into concepts reflecting actual sensation seeking behavior, as based on the DS and BS subscales, and hypothetical behavior, as represented by the TA and ES subscales.

Index words: pathological gambling, sensation seeking, SSS-V

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B.S., KENNESAW STATE UNIVERSITY, 2006

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2009

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ACKNOWLEDGEMENTS

I would like to express my gratitude to my major professor, Dr. Adam Goodie, for his direction and support for the studies that are included here as well as his suggestions and comments on my writing. I would also like to thank Dr. Nash Unsworth and Dr. Keith Campbell for their critiques and suggestions. I would also like to acknowledge the undergraduate assistants that helped me collect my data for this project. The completion of my thesis would not have been possible without the support and guidance of my major professor, my committee, and my assistants. Thank you.

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CHAPTER 1

INTRODUCTION

Pathological gamblers (PGs) are consumed by the act of gambling to such a degree that they put their relationships, career, and financial stability at risk. PGs will continue to gamble despite arising family and financial distress, they have difficulty controlling the urge to gamble, and they will often be unable to reduce the amount of time and money that they spend gambling. In fact, PGs will often gamble with progressively larger amounts of money in order to meet their ever-increasing need for excitement and pleasure. This is one reason why PGs may be considered risk-takers or sensation seekers; they will put a great deal at risk and often have a complete disregard for their own well-being so that they may achieve a certain level of stimulation.

A broad consensus is yet to be reached regarding the relationship between sensation seeking and gambling activity. Several studies support the more intuitive argument that sensation seeking is more prevalent in the pathological gambling population than in other groups of individuals, such as nongamblers or social gamblers (Gupta, Derevensky, & Ellenbogen, 2006; Kuley & Jacobs, 1988; Powell, Harddon, Derevensky, & Gupta, 1999). However, other studies show support for the contrary, with gamblers actually displaying less sensation seeking characteristics than the general population or their nonpathological gambling counterparts (Blaszczynski, Wilson, & McConaghy, 1986; Blanco, Orensanz-Munoz, Blanco-Jerez, & Saiz-Ruiz, 1996; Carrasco, Saiz-Ruiz, Hollander, Cesar, & Lopez-Ibor, 1994; Dickerson, Hinchy, & Fabre, 1987). Still others find that the sensation seeking is nearly identical among gamblers as

among nongamblers, with no significant differences identified between the groups (Anderson & Brown, 1984; Blaszczynski, McConaghy, & Frankova, 1990; Bonnaire, LeJoyeux, & Dardennes, 2004; Coventry & Brown, 1993; Dickerson, Walker, England, & Hinchy, 1990; Parke, Griffiths, & Irwing, 2004).

Classification of Pathological Gambling

Pathological gambling is formally categorized as an impulse control disorder (ICD; American Psychiatric Association, 2000). PGs often display an inability to control impulses or inhibit certain behaviors, which leads to an intuitive expectation that PGs should score higher on measures of sensation seeking. Pathological gambling, along with other ICDs (i.e., intermittent explosive disorder, kleptomania, pyromania, and trichotillomania), are marked by behavioral independence in which individuals display a "failure to resist an impulse . . . an increasing sense of tension or excitement before acting out, a sense of pleasure, and gratification or release at the time of the behavior or shortly thereafter" (Lejoyeux, McLoughlin, & Ades, 2000, p. 130). Similar to what is found with pathological gambling research, studies investigating the relationship between other ICDs and sensation seeking show mixed results, with some supporting elevated sensation seeking scores in those suffering from ICDs (Bayle, Caci, & Millet, 2003; Lejoyeux, Feuche, Loi, Solomon, & Ades, 1998) and others showing no significant differences between sensation seeking scores of ICD patients and others (Billieux, Rochat, & Rebetez, 2008; Lejoyeux, Arbaretaz, McLoughlin, & Ades, 2002). In addition to being recognized as an ICD, pathological gambling is also frequently conceptualized as an addictive disorder; one which mirrors certain qualities seen in other addictive disorders such as alcoholism (Lejoyeux et al., 2000). Studies investigating the relationship between sensation seeking

behavior and drug and alcohol addiction come to a more consistent conclusion that individuals with drug or alcohol problems display greater sensation seeking behavior (D'Allessio, Baiocco, & Laghi, 2006; Dom, Hulstijn, & Sabbe, 2006; Dubey & Arora, 2008; Sutker, Archer, & Allain, 1978; Wagner, 2001).

Pathological Gambling and Sensation Seeking

When evaluating sensation seeking in relation to gambling activity, many research studies use the Sensation Seeking Scale Form V (SSS-V; Zuckerman, Eysenck, & Eysenck, 1978), which is a 40-item scale divided into four subscales: Thrill and Adventure Seeking (TA), Experience Seeking (ES), Disinhibition (DS), and Boredom Susceptibility (BS). The four subscales of the SSS-V represent unique facets of sensation seeking activity, which are combined into the total sensation seeking score. The SSS-V is intended to be a measure of sensation seeking for the general population and it is possible that PGs could score high on certain subscales of the SSS-V and score low on others. When assessing the relationship between sensation seeking and gambling, researchers have usually relied solely upon the overall score and rarely investigate the influence of the individual subscales. To date, the sole exception to this common methodology is a study by Blaszczynski et al. (1990) looking at the correlation between boredom susceptibility and gambling. The authors expected to find higher boredom susceptibility scores and depression levels in those participants who identified as PGs, but found no significant differences found between PGs and nonpathological gamblers (NPGs).

SSS-V Subscales

Even though the SSS-V total scores from past literature do not establish a solid connection between sensation seeking and pathological gambling, the individual subscales could be useful in doing so. This is not entirely a new idea, as it has previously been suggested that "before abandoning sensation seeking as having no predictive value, the four factors of the trait could perhaps be separated and used as independent variables in multiple regression" (Parke et al., 2004, p. 209). It has also been suggested that based on similarity and content, the four subscales pair off to form two different constructs of sensation seeking with one including DS and BS and the other including TA and ES. The construct including the DS and BS subscales has been identified as "excitement seeking" in the substance abuse literature and was shown to account for a large amount of the variance in alcohol use, with Beta weights ranging between .52 and .60 (Finn, Sharkansky, Brandt, & Turcotte, 2000; Justus, Finn, & Steinmetz, 2000). In particular, the DS and BS subscales showed strong correlations with the frequency, quantity, and density of alcohol use.

Genetic analysis in twin studies also indicates that strong genetic correlations exist between DS and BS (an average correlation of $r = .545$ for men and women) and between TA and ES (and average correlation of $r = .480$ for men and women). Although the genetic analysis reveal that there are also correlations seen for the other subscales, they are not as strong, with average correlations of r = .355 for TA and DS and r = .410 for ES and BS (Koopmans, Boomsma, Heath, & van Doormen, 1995). The relationship between the TA and ES subscales and the DS and BS subscales is also validated with the correlations seen in the original Zuckerman et al. (1978) paper. They acknowledge that while TA and ES show strong correlations across sex and culture with r-vales ranging from .27 to .42 ($p < .01$), TA

demonstrates a weak relationship with DS and BS, especially in male samples. Furthermore, the DS and BS subscales correlations consistently represent the most robust correlations with r-values ranging from .37 to .48 ($p < .01$).

When looking at subscale scores from previous studies, especially in studies showing that NPGs have greater SSS-V total scores than PGs, the NPG individuals tend to display higher TA and ES scores, even when these differences do not reach significant levels (see Table 1). However, PGs are likely to have BS and DS scores that are equal to or higher than those seen in NPGs. Surprisingly, several studies that investigate pathological gambling and sensation seeking only report the SSS-V total score and do not report subscale values (e.g., Anderson & Brown, 1984; Dickerson et al., 1987; Parke et al., 2004). After reviewing several studies investigating the relationship between pathological gambling and sensation seeking, Hammelstein (2004) proposed that the most universal conclusion is that PGs actually display sensation seeking to a lesser degree than NPGs, based on analysis of total scores and an effect size of d = -.32, with the negative effect size indicating higher overall scores for NPGs. However, a different picture may become apparent when focusing on subscale scores.

Due to the relatively small number of studies that report subscale scores, only a portion of the studies included in Hammelstein's (2004) analysis (7 of 16) could be used in a new meta-analysis of the four subscale scores. As can be seen in Table 1, the average effect size of the total SSS-V score across the included studies (d = -0.37) reaffirms Hammelstein's findings. However, only two of the four subscales show an average effect size of greater than .2: TA, with an average effect size of d = -.32, and ES, with an average effect size of d = -.22. Again, with the negative effect sizes indicating that NPGs score higher on these subscales than PG groups. The combination of Hammelstein's conclusion regarding the total SSS-V score and the new

information gathered from the smaller, more specified meta-analysis indicate that there may be some type of relationship at play between gambling behavior and subscale scores, which would in turn influence the total score.

Participants were drawn from a college sample. SSS-V scores tend to be highest in the 16- to 19-year-old age group (Ball et al., 1984; Zuckerman et al., 1978) and these elevated levels of sensation seeking behavior may be expressed through gambling related activities. According to Petry (2004), the prevalence of pathological gambling in adolescents is 3.9%, compared to the 1.6% prevalence rate for adults. Other studies have indicated even higher rates of pathological gambling for adolescents, with some as high as 4.7% (Gupta & Derevensky, 1998), 5.8% (Adalf & Ialomiteanu, 2000), 16% (Gerdner & Svensson, 2003), or even as high as 19.3% (ladouceur, Ferland, Poulin, Vitaro, & Wiebe, 2005). Although the idea has not been extensively explored, Gupta et al. (2006) indicate that probable pathological gambling in adolescents can be best predicted when utilizing models that include DS and BS among other factors unrelated to sensation seeking (i.e., conformity, cheerfulness, self-discipline, and excitability). The purpose of the current study is to investigate how the individual subscale scores of the SSS-V could be affecting the total score in such a way that creates a misrepresentation of the relationship between sensation seeking and gambling behavior.

CHAPTER 2

METHOD AND RESULTS

Two studies utilized diagnostic gambling measures and a general measure of sensation seeking to identify how self-reported sensation seeking behavior may be influenced by pathological gambling status. The first study incorporated a longitudinal design that required participants to complete measures on three separate occasions, while the second study was more simplified in that participants completed the measures during one session.

Methods

Participants

Study 1. The sample originally consisted of 81 undergraduate students from the research pool at the University of Georgia who participated in order to receive class credit. After participant attrition, 72 students (86% male) with a mean age of 18.76 completed measures for all three sessions. When volunteering for this study online, participants read a brief description of the study that indicated that those signing up should be “frequent gamblers”, defined as participating in gambling-related activities at least once a week.

Study 2. . Participants included 212 men (71.9%) and 83 women (28.1%) with a mean age of 19.17 (1.28). When volunteering for this study online, participants read a brief description of the study, which indicated that those signing up should be “frequent gamblers”, defined as participating in gambling-related activities at least once a week.

Measures.

Diagnostic Interview for Gambling Severity (DIGS; Winters, Specker, & Stinchfield, 1996). The DIGS assesses gambling involvement by using questions that require participants to indicate whether each scenario regarding their personal gambling behavior is very true, somewhat true, or false (e.g., "Have you frequently thought about ways of getting money with which to gamble?"). Questions are grouped into pairs and any combination of answers other than false-false results in the participant receiving a point. The total score is assessed on a scale of 1 to 10, with a score of 5 or higher indicating pathological gambling status. Due to the methodology of the current study, it is also important to note that the DIGS shows good test-retest reliability of .83 (Winters et al., 1996).

The South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). As with the DIGS, individuals are considered to be PGs if they obtain a score of 5 or higher on the SOGS. Although originally developed according to the DSM-III criteria, the SOGS continues to sustain a strong relationship with DSM-IV criteria (Stinchfield, 2002). The SOGS has also recently been identified as the best measure for identifying pathological gambling in college students, as compared to the DIGS and MAGS-DSM-IV (Weinstock, Whelan, Meyers, & McCausland, 2007), and shows good test-retest reliability of .71 (Lesieur & Blume).

Sensation Seeking Scale Form V (SSS-V; Zuckerman et al., 1978). The SSS-V measures sensation seeking interests with 40 questions divided into four subscales: Thrill and Adventure Seeking (TA), Experience Seeking (ES), Disinhibition (DS), and Boredom Susceptibility (BS). A total sensation seeking score is calculated as well as scores for the individual subscales. Participants can earn a score of 0 to 10 on each of the four subscales, with the total score ranging from 0 to 40.

Procedure

For Study 1 and Study 2, participants were seated at individual computer stations divided by partitions where they completed the designated measures on MediaLab. For Study 1, participants completed the DIGS and SOGS during all three sessions and completed the SSS-V during the first session. After completing the measures for the first session, participants were scheduled to return in 4 weeks for their second session. In some instances it was necessary to schedule the second session as much as a week early or late due to scheduling conflicts. The same process occurred after the second session, where participants scheduled their return for the third session approximately 4 weeks after their second session. As previously stated, for Study 2 participants completed all measures during one session.

Study 1 Results and Discussion

DIGS and SOGS

The two measures of pathological gambling, the DIGS and SOGS, showed strong correlations with one another across all three sessions with Pearson's *r* values of .72, .62, and .80, $p < .001$, respectively. The DIGS and SOGS also both demonstrated strong test-retest values, with Pearson's *r* correlations for the DIGS of .73 between sessions 1 and 2, .80 between sessions 2 and 3, and .62 between sessions 1 and 3. Correlations for the SOGS were .79 between sessions 1 and 2, .75 between sessions 2 and 3, and .65 between sessions 1 and 3.

PG Status

For the purpose of this study, PG status of the participants was based on the combination of their DIGS and SOGS scores. In order to be classified as a PG, a participant had to earn a score of 5 or higher on *both* the DIGS and the SOGS. A participant's PG status was determined

for each session independently from the other sessions (i.e., PG status for session 1 did not affect or determine PG status for session 2 or 3) and roughly 20% of each session reached PG status. For Session 1, 16 of the 81 participants were identified as PGs; for Session 2, 15 of the 73 participants were identified as PGs; and for Session 3, 14 of the 72 participants were identified as PGs.

SSS-V

Correlations among subscales (see Table 2) are similar to those found in the original Zuckerman et al. (1978) study. While the TA and ES subscales had a relatively strong relationship ($r = .429$, $p < .001$), the TA subscale did not show significant correlations with the other two subscales, DS and BS. As can be seen in Table 4, the DS and BS subscales had consistent correlations with the pathological gambling measures, with DS significantly correlating with both DIGS and SOGS across all 3 sessions and with BS significantly correlating with SOGS across all 3 sessions and with DIGS 2 out of the 3 sessions. The TA subscale was consistently uncorrelated with the DIGS and SOGS while the ES subscale was inconsistent in that significant correlations are reached for sessions 2 and 3 but not for session 1. The internal consistencies of the subscales as measured by Cronbach's alpha were also similar to those found in the original Zukerman et al. study (see Table 3), especially for the TA and DS subscales and the total SSS-V score. The internal consistencies for the ES and BS subscales were slightly lower than those seen in the original paper.

Because the SSS-V was only administered during Session 1, sensation seeking comparisons with diagnostic gambling measures was based upon DIGS and SOGS scores received during Session 1. There was no significant difference between the means for PGs ($M = 22.13$, $SD = 7.02$) and NPGs ($M = 20.98$, $SD = 6.25$) for the total SSS-V score ($t = .638$, $p =$

.525). For the TA subscale, there was also no significant difference for NPGs (M = 7.00, SD = 2.65) and PGs (M = 6.75, SD = 2.77; t = .336, p = .738). This was also the case for the ES subscale for NPGs (M = 4.29, SD = 1.98) and PGs (M = 4.18, SD = 2.29; t = .184, p = .855). For the DS scores, PGs (M = 6.69, SD = 2.94) did not significantly differ from NPGs (M = 5.82, SD = 2.75; t = -1.12, p = .265) and for the BS scores the PGs (M = 4.50, SD = 1.67) did not significantly differ from NPGs (M = 3.88, SD = 1.75; t = -1.29, p = .201).

Discussion

Although t-tests did not reveal significant results, the connection between pathological gambling and sensation seeking is supported by the significant correlations seen between the SSS-V total score and DIGS and SOGS scores, as shown in Table 4. The relationship between the separate subscales of the SSS-V and gambling is not clear-cut, but the DS and BS subscales show a strong correlation, which mirrors results seen in Zuckerman et al.'s work. It was predicted that PG individuals would display higher scores on the DS and BS subscales of the SSS-V while the NPG individuals would display higher scores on the ES and TA subscales. Mean scores were in the predicted direction, and although the mean differences between PG and NPG scores did not reach significance, this may be due in part to the small sample size used. Important subscale relations emerged from these results and warrant further research with a larger sample size, which is the purpose of Study 2.

Study 2

The purpose of Study 2 was to replicate the results from Study 1 with a larger sample in hopes of mean differences reaching significant levels. While Study 1 incorporated a longitudinal design, Study 2 was simplified in that participants only completed the measures once. It was

hypothesized that PGs would display greater SSS-V total scores than NPGs and that this would be due to inflated DS and BS scores seen in that group.

Study 2 Results and Discussion

DIGS, SOGS, and PG status

As in Study 1, the DIGS (M = 4.04, SD = .15) and the SOGS (M = 4.26, SD = .19) correlated highly with each another (r = .716, p < .001). Again, as in Study 1, PG status of the participants was based on the combination of their DIGS and SOGS scores with a score of 5 or higher on *both* the DIGS and the SOGS establishing a PG status. The percentage of PGs in the Study 2 was greater than that seen in Study 1, with 86 participants (29%) classifying as PGs. Of those labeled as PGs, the mean scores were clearly greater than the cut-off score of 5 on both the DIGS (M = 6.80, SD = 1.55) and the SOGS (M = 8.17, SD = 2.60).

SSS-V

The internal consistency of the total score and the subscales is again consistent with reliability values seen in Zuckerman et al.'s (1978) article (revisit Table 3). The inter-subscale correlations are similar to those seen in Study 1 in that the TA and ES subscales and the DS and BS subscales still show strong correlations. However, two main differences in the subscale correlations are apparent. While in Study 1 the TA subscale only correlated with the ES subscale, in Study 2 the TA subscale correlated with DS and BS as well, but the strongest correlation remained between TA and ES. A second difference was the relationship between ES and DS. While these two subscales correlated in Study 1, they did not correlate to the degree that they do in Study 2.

The correlations between the SSS-V subscales and the pathological gambling measures are similar to those seen in Study 1. The DS and BS subscales and the total SSS-V score significantly correlate with the DIGS and SOGS scores (see Table 4). These relationships are further reflected in the significant mean differences seen in the total SSS-V score for PGs (M = 24.17, SD = 5.77) and NPGs (M = 21.29, SD = 5.94; t = 3.82, $p < .001$). Based on the hypotheses, the higher total score for PGs suggests that there should also be significant mean differences for the DS and BS subscales, with PGs scoring higher than NPGs in both of these areas. As predicted, the DS scores for PGs (M = 6.62, SD = 2.23) are significantly higher than those seen for NPGs (M = 5.72, SD = 2.71; t = 2.72, $p < .01$) and the BS scores for PGs (M = 4.56, SD = 2.20) are also significantly higher than those seen for NPGs (M = 3.30, SD = 1.64; t = 5.38, $p < .001$). As in Study 1, there is no significant mean difference for PGs (M = 7.56, SD = 2.12) and NPGs (M = 7.37, SD = 2.52) on the TA subscale, t = .598, p = .550. However, there is a slight significant mean difference for the ES subscale, with PGs (M = 5.44, SD = 2.29) scoring higher than NPGs (M = 4.89, SD = 2.11), which was not expected, t = 1.98, $p < .05$.

Discussion

As predicted, utilization of a larger sample led to mean differences reaching significant levels. For the most part, the SSS-V scores mirrored those seen in Study 1, with PGs having higher total scores and higher BS and DS scores than NPGs. The replication of the results from Study 1 suggest that the DS and BS subscales play an important role in the total SSS-V score for PGs.

CHAPTER 3

GENERAL DISCUSSION

Historically, NPGs have been shown to display greater sensation seeking than PGs. Study 1 set out to implicate the power of the TA and ES subscales in the elevation of the total SSS-V score for those individuals classified as NPGs. However, results from Study 1 and Study 2 showed that PGs were greater sensation seekers than NPGs. In addition to having higher total scores, PGs also displayed greater DS and BS subscale scores. These mean differences were significant in Study 2 and approached significance in Study 1, but were fettered by a small sample size. The strong correlations seen between the designated subscales in Study 1 speak to the strength of their relationship despite insignificant *t*-test results. These results spawn two important questions: One, why does it seem as though the higher SSS-V total scores in NPGs are connected to higher ES and TA scores and higher SSS-V total scores in PGs are connected to higher DS and BS scores and two, if NPGs on average show greater sensation seeking than PGs, why did the PGs in this sample (and some other samples) show greater sensation seeking?

The first question posed focuses on the relationship seen between certain subscales and PG status. Literature in sensation seeking and addiction as well as genetic research looking at the SSS-V lends support to the idea that there is a connection between the DS and BS subscales and it appears as though PGs score higher on these subscales, but why is this the case? The current paper aims to suggest that the four SSS-V subscales actually diverge into two separate constructs, as indicated by previous alcohol and substance abuse literature (Finn et al., 2000; Justus et al., 2000; Koopmans et al., 1995), but more specifically this paper proposes that one

construct highlights past experiences and the other highlights desires that may not accurately depict behaviors. Of the four subscales in the SSS-V, three of them (TA, DS, and BS) clearly demonstrate this concept while the fourth subscale (ES) requires a more in-depth analysis in order to determine its placement among the two diverging constructs. When looking at the DS subscale the majority of the statements focus on past behaviors or actual experiences in which the person has participated, including declarations such as "I like" or "I enjoy" (e.g., "I like to get high."). The BS subscale also focuses on life experiences and feelings regarding those experiences (e.g., "I get very restless if I have to stay around home for any length of time."), which is why the current study places DS and BS together in one construct reflecting sensation seeking *behavior*.

On the contrary, 8 out of 10 items on the TA subscale are hypothetical in nature, beginning with or including declarations such as "I would" or "I wish" (e.g., "I would like to take up the sport of water skiing."). The ES scale encompasses statements based on hypothetical situations and those based on past behaviors, but the current paper proposes that the ES scale is more closely related to the TA subscale, and therefore will be viewed as belonging to the construct reflecting hypothetical sensation seeking behavior. This decision is based partly on the original correlations for the SSS-V subscales listed in Zuckerman et al.'s (1978) study, as well as correlations from the current studies, which show that the TA subscale is most highly correlated with the ES subscale. Because pathological gambling is recognized as both an ICD and an addictive disorder, intuitively PGs should display more sensation seeking behavior. However, if certain subscales of the SSS-V actually reflect hypothetical scenarios as opposed to actual experiences and past behaviors, it is possible that NPGs may actually score the same or higher than PGs on these subscales, which may in part help to explain why research investigating the

relationship between sensation seeking and gambling thus far is inconsistent and perhaps even misleading. The hypothetical nature of the questions included in the TA and ES subscales allow for speculative interpretation, meaning that those who interpret the data must assume that the participants' noted desire to participate in certain activities accurately reflects behaviors that those participants have displayed or will display in the future. The problem therein is that thoughts or desires do not always lead to action. This is in essence what sets PGs apart from NPGs – the inability to control desires and suppress action – which is at the root of such conditions as ICDs and addictive disorders.

Even when people indicate that they would "like to try parachute jumping" (a statement from the TA subscale), this does not necessarily mean that they would actually follow through with this behavior if given the opportunity. When defining the concepts of TA and DS, Zuckerman et al. (1978) use the term "desire" in both definitions, but one key word sets them apart. While TA is "a desire to engage in sports or other activities involving speed or danger", DS is "the desire for social and sexual disinhibition as *expressed* [italics added for emphasis] in social drinking, partying, and variety in sexual partners" (p. 140). Even though both of these subscales reflect a desire to participate in certain sensation seeking activities, only DS manifests or expresses that desire through actual behavior. The lack of behavioral expression in the TA subscale allows its statements to remain hypothetical in nature.

Even if there is support for the idea that that the TA and ES subscales represent a hypothetical construct, why would NPGs fall victim to this more than PGs? Some evidence exists as to why PGs would be unlikely to score high on the TA subscale, but it is less clear as to why NPGs would be likely to score high on the TA subscale. First and foremost, perhaps PGs do not score high on this scale because the types of activities incorporated in the scale (e.g., scuba

diving, waterskiing, etc.) do not appeal to them. This is not to say that these activities are boring or unexciting or that they do not appeal to the general public, but that these types of activities do not incorporate the *type* of excitement that PGs are looking for. It is plausible that these thrill and adventure activities do not provide the sort of rush or sensation that a PG is seeking to a significant enough degree to move them drastically away from the baseline seen for a specific age group.

Secondly, if PGs are motivated by the idea of a monetary gain as some research suggests (Dzik, 2006), these types of activities would certainly not cater to that need. A more generalized motive for gambling is winning, for both PGs and NPGs (Platz & Millar, 2001), but the motives that PGs cite for participating in other recreational activities that are unrelated to gambling provide some insight into what stimulates them. While winning moves to the bottom of the list as a motive for NPGs to participate in various recreational activities, winning is still indicated as the 6th greatest motive out of 23 possible motives for PGs to participate in a recreational activity (Platz & Millar). If PGs know that the types of activities mentioned in the TA subscale will *not* provide the type of thrill that they are looking for, they will have no problem indicating that they would *not* like to participate in them. On the other hand, when faced with the hypothetical scenarios presented in the TA subscale, although NPGs may not be certain that they would in fact participate in these activities if given the opportunity to do so, they might be more likely to claim they would. The fact that these scenarios are hypothetical might make them more appealing to NPGs because indicating that they would like to try these activities does not mean that they actually have to follow through with them.

There does not seem to be a straight forward answer regarding why this sample deviated from the norm and showed PGs as more sensation seeking than NPGs. When comparing the

SSS-V scores seen in these two studies with the data for 16-19 year old American men in the Zuckerman et al. paper, it is clear that the PGs in the current study had greater total scores as well as greater DS and BS scores while the TA and ES scores were relatively similar to Zuckerman et al.'s sample of college-aged men. The NPGs in the current studies displayed scores that were similar to Zuckerman et al.'s sample for all subscales and the total score. It is possible that there is an age component that needs to be considered when evaluating the relationship between sensation seeking and pathological gambling. Because sensation seeking and pathological gambling are more prevalent at younger ages, there could be a unique interplay between these factors. Most studies researching the influence of gambling status on sensation seeking use a more diverse age range than the one seen in the current sample, which could in part help to account for the greater level of sensation seeking observed in PGs in this sample. This is one factor that definitely needs to be considered when conducting future research in the area, especially if using an age-limited sample.

Limitations and Future Directions

Because all of the participants came from a research pool at an undergraduate institution and the sample was predominantly male with a mean age between 18- and 19-years-old for both Study 1 and 2, it may not be appropriate to generalize these findings to other populations of people. The age of participants is especially important when looking at factors that greatly vary along the age continuum, such as gambling behavior and sensation seeking. As mentioned earlier, because both of these factors are easily identified in younger age groups, it is uncertain whether the results seen here would be obtained if using an older age group. However, previous literature in the field does lend support to the idea that the subscale scores need to be more

seriously considered when investigating the relationship between gambling and sensation seeking. Therefore, it may prove beneficial to attempt to replicate the findings from these two studies in a community sample with a wider age range and a more symmetrical division of sex to see what types of patterns may emerge for different age groups of PGs and NPGs.

The recognition of pathological gambling as both an ICD and an additive disorder should also be considered in future research. Perhaps characteristics from one of these classification groups have more bearing on sensation seeking personality than the other. For example, perhaps the inability to control impulses is more responsible for the specific type of sensation seeking seen in PGs than the characteristics identified by addictive disorders. Although past research has investigated the impact of alcohol and drug addictions on sensation seeking, as is the issue with pathological gambling research, they tend to focus on the SSS-V total score and generally ignore the impact of the individual subscales. The proposal that the SSS-V subscales may be grouped together to identify behavioral and hypothetical sensation seeking needs to be further explored. It would be interesting to design a study in such a way as to test whether participants would actually follow through with the hypothetical activities listed in the TA and ES subscales. Perhaps being put in a situation where the participants may actually have to take part in risky activities such as bungee jumping or skydiving would make them re-evaluate their responses.

There has been a great deal of research investigating the relationship between sensation seeking and gambling but insufficient time has been given to the unique facets of sensation seeking, as represented by the SSS-V subscales, and how and why these may differ for PGs and NPGs. The typical traits of PGs, which are characteristic of ICDs and addiction disorders, make it likely for them to represent a distinctive type of sensation seeker that may be best identified by particular sensation seeking dimensions, like those outlined by the DS and BS subscales.

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Table 1: Means, Standard Deviations, and Effect Sizes for SSS-V Total and Subscale Scores from Previous Gambling Studies†

	Total			DS			BS			TA			ES		
	PG	NPG	*d*	PG	NPG	*d*	PG	NPG	*d*	PG	NPG	*d*	PG	NPG	*d*
1.	14.60 (4.90)	17.33 (5.28)	-0.54	3.15 (3)[a]	4.22 (6)[a]	-	2.89 (1.63)	2.52 (2)[a]	-	3.93 (2.50)	5.48 (6)[a]	-	4.63 (1.98)	5.11 (6)[a]	-
2.	17.45 (5.85)	20.20[b] (6.9)	-0.43	4.98 (2.26)	4.8 (2.7)	0.07	3.51 (1.60)	3.5 (2.1)	0.00	4.90 (2.55)	6.4 (2.8)	-0.56	4.09 (2.30)	5.4 (2.2)	-0.58
3.	14.8 (4.4)	21.8 (4.4)	-1.59	2.4 (1.2)	3.9 (1.5)	-1.10	3.9 (1.7)	6.2 (1.5)	-1.43	4.3 (2.4)	6.07 (2.03)	-0.80	4.2 (1.09)	5.6 (2.05)	-0.85
4.	17.54 (7.01)	17.54 (5.98)	0.00	4.67 (1.70)	5.12 (2.18)	-0.23	4.52 (2.80)	5.25 (4.52)	-0.19	3.33 (1.89)	2.87 (1.85)	0.25	5.00 (2.46)	5.02 (2.46)	-0.00
5.	20.91 (5.72)	21.40[c] (5.97)	-0.08	4.64 (2.36)	4.47 (2.02)	0.08	4.28 (1.84)	3.95 (1.89)	0.18	6.61 (2.34)	7.17 (2.30)	-0.24	5.28 (1.87)	5.87 (1.71)	-0.33
		23.20[d] (5.92)	-0.39		5.53 (2.26)	-0.39		4.02 (2.09)	0.13		7.55 (2.07)	-0.43		6.26 (2.05)	-0.50
6.	16.86 (7.38)	17.53 (7.96)	-0.09	4.59 (2.91)	4.64 (2.73)	-0.02	3.91 (2.24)	3.48 (2.24)	0.19	4.25 (2.74)	5.23 (7.96)	-0.16	4.10 (2.04)	4.26 (1.96)	-0.08
7.	22.07 (22.95)	18.53 (19.57)	0.17	6.23 (6.56)	4.16 (4.62)	0.36	3.53 (1.41)	1.80 (1.36)	1.25	NR	NR	-	6.17 (1.87)	4.67 (2.01)	0.77
Mean *d*			-0.37			-0.18			0.02			-0.32			-0.22

Notes. Only studies that reported subscale scores for the SSS-V are included. Negative *d* values indicate greater NPG scores as compared to PG scores.
† The table is divided in such a way that studies 1 – 3 represent those in which NPGs have greater SSS-V total scores, studies 4 – 6 represent those in which NPGs have SSS-V total scores equal to PGs, and study 7 represents studies in which PGs have greater SSS-V total scores.
1. Blanco et al. (1996) 2. Blaszczynski et al. (1986) 3. Carrasco et al. (1994) 4. Blaszczynski et al. (1990) 5. Bonnaire et al. (2004) 6. Coventry and Brown (1993) 7. Kuely and Jacobs (1988)
NR = value not reported in original paper
a Median value reported instead of SD reported in original paper. Therefore, effect sizes are not calculated for these values; **b** General population scores taken from Ball, Farnhill, and Wangeman (1984); **c** NPG group represents "regular gamblers"; **d** NPG group represents "nongamblers"

Table 2: Correlations between SSS-V subscales for Study 1 and 2

	Study 1				Study 2			
	TA	ES	DS	BS	TA	ES	DS	BS
ES	.406**	---	---	---	.302**	---	---	---
DS	.175	.364**	---	---	.270**	.324**	---	---
BS	.192	.262*	.409**	---	.145*	.106	.294**	---
Total	.675**	.718**	.738**	.615**	.671**	.655**	.751**	.540**

* $p < .05$
** $p < .001$

Table 3: SSS-V subscale reliabilities

	Zuckerman et al. (1978)†	Study 1	Study 2
TA	.77	.78	.76
ES	.61	.50	.60
DS	.74	.79	.75
BS	.57	.31	.48
Total	.84	.80	.79

† based on the male American sample

Table 4: Correlations between SSS-V scores and diagnostic gambling measures

	Study 1				
	TA	ES	DS	BS	SSS total
DIGS1	.037 (NS)	.043 (NS)	.344 (.002)	.290 (.009)	.258 (.020)
SOGS1	.026 (NS)	.163 (NS)	.358 (.001)	.343 (.002)	.313 (.004)
DIGS2	.078 (NS)	.292 (.014)	.397 (.001)	.234 (.050)	.370 (.001)
SOGS2	.005 (NS)	.329 (.005)	.373 (.001)	.292 (.013)	.358 (.002)
DIGS3	.050 (NS)	.263 (.026)	.300 (.011)	.180 (NS)	.290 (.014)
SOGS3	.125 (NS)	.350 (.003)	.244 (.040)	.241 (.043)	.339 (.004)

	Study 2				
	TA	ES	DS	BS	SSS total
DIGS	.109 (NS)	.049 (NS)	.194 (.001)	.299 (.001)	.240 (.001)
SOGS	.047 (NS)	.141 (.05)	.243 (.001)	.266 (.001)	.259 (.001)