The Efficacy of the Theory of Reasoned Action to Explain Gambling Behavior in College Students

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Shaffer and Hall (1997) have estimated college student gambling to be three times as high as their adult counterparts. Despite a considerable amount of research on gambling, researchers have struggled to develop a universal theory that explains gambling behavior. This study explored the potential of Ajzen and Fishbein's (1980) Theory of Reasoned Action to explain college student gambling. The results from 345 completed student surveys indicated both gambling attitudes and subjective norms significantly and positively predicted gambling intentions; however, the explained variance in gambling intentions was low. Gambling intentions significantly and positively predicted gambling behavior in terms of specific gambling types. Modifications to the Theory of Reasoned Action are suggested to better explain college student gambling behavior.

Gambling has been popular for a long time, and its popularity continues to grow. Since the early 1960s, 37 states and the District of Columbia have re-established state lotteries. Also, since 1991, 60 riverboat casinos opened, and these new casinos captured 20% of the casino market in the United States (Kentucky Legislative Research Committee). College students are at an age that is highly impressionable, experimental, and prime for taking risks, while ignoring the possible consequences and, therefore, are particularly susceptible to problem gambling (Oster, 1992).

Gambling, whether legal or illegal, is readily available to students on college campuses and surrounding areas (Saum, 1999). Indeed, among the problem behaviors of college students, gambling has received the least amount of attention despite its prevalence (Dunne, 1985; Shaffer, Forman, Scanlan, & Smith, 2000). In fact, a meta-analysis of published studies on college students estimated the prevalence rate of problem gambling among college students at 5.6%, approximately three times the rate found in adults (Shaffer & Hall,

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1997). However, much is unknown about the gambling behaviors of college students, or what impacts their gambling intentions. This study attempts to fill the gap in the research.

The first step to better understand gambling behavior is to identify an appropriate theoretical framework with which to examine such behavior. Gambling researchers have struggled to develop a single theoretical framework that universally explains gambling behavior. To date, no single framework has emerged as a widely accepted explanation of gambling behavior. The following literature review defines gambling and discusses several of the available theories present in the field of gambling today.

Literature Review

Gambling is a very prevalent legalized activity that can be considered a non-drug related behavior with addictive potential (Potenza, Fiellin, Heninger, Rounsaville, & Mazure, 2002). For the purposes of this study, gambling is defined as "any risky behavior, based on a combination of skill or chance, or both, in which something of value can be won or lost" (Kassinove, 1996, p. 763). Many types of gambling are prominent today including card games, dice games, lotteries, slot machines, sport games, and pari-mutuel gambling. Tabor (1987), Murray (1994), and Brown (1987) have suggested that it is difficult to fully describe or conceptualize gambling behavior or gambling problems using any one model. Shaffer and Gambino (1989) suggested three reasons why there is a conceptual crisis in the understanding of compulsive gambling: a) the absence of an accepted paradigm, b) the consequent paucity of facts, and c) the lack of integration between research, theory, and practice. Brown (1987) suggested that using one model in exclusion of others acts as a perceptual filter, and leads to some aspects of behavior being ignored or relegated to the background. Rosenthal (1987) identified three clusters of theoretical constructs that have been used to examine gambling behavior: a) psychodynamic theories, b) biological theories, and c) behavioral theories.

Psychodynamic Theories

Psychodynamic models, also called psychoanalytical theories (Lesieur & Rosenthal, 1991) of pathological gambling, view the problem as within the gambler's psyche. These theorists suggest that the pathological gambler uses gambling in an attempt to heal a psychic wound or as a means of coping with conflict. Jacob's General Theory of Addiction (1986) suggests two underlying and interacting conditions cause discomfort for an individual, leading to an attempt to self-medicate by engaging in an addictive behavior. The two factors are a uni-polar physiological resting state and a physiological problem such as rejection or insecurity that creates considerable physiological pain (Jacob). Gupta and Derevensky (1998) found Jacob's Theory is plausible to help explain the development of problematic gambling in adolescents.

Biological Theories

Theories classified as biological are those which tend to view gambling problems as a result of some physiological predisposition or condition that results in a physiological response to gambling activity (Blume, 1987). Supporting this approach are research findings that suggest addictions tend to run in families (Blume, 1987). Lesieur and Rosenthal (1991) believe there are three main models within the biological school of theories of problem gambling: (a) models which have explored electroencephalogram (EEG) waves, (b) models based on plasma endorphin levels, and (c) models which are based on the incidence of other brain chemical imbalances. For example, Ferris, Wynne, and Single (1999) studied the role of EEG brain waves, plasma endorphin levels connected to arousal, and brain chemical imbalances in hopes of differentiating problem gamblers from other gamblers.

Behavioral Theories

Trait Theory. Grahm and Lowenfeld (1986) examined different trait profiles for a group of men ($N = 100$) in treatment for gambling problems. Their study showed very high scores on the psychopathic deviate scale, indicating a tendency toward a sociopathic, sensation seeking lifestyle. Given the pivotal role of arousal in gambling, it is proposed that sensation seeking (Zuckerman, 1979) is a personality trait that warrants further investigation in regards to its relationship with gambling. Sensation seeking is the "need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, p. 10). Zuckerman's theory predicts high sensation seekers will perceive gambling situations to be less risky and will enjoy arousing experiences more than low sensation seekers (Zuckerman).

Blaszczynski, McConaghy, and Frankova's (1990) study suggested three separate types or clusters of pathological gamblers: (a) those who were depressed, (b) those who were primarily just bored, and (c) those bored and depressed. Clinical support for this topology of gambling is offered by Selzer (1992), who notes skilled gamblers are more likely to have personality disorders, while luck gamblers are most likely to have affective disorders. Gambling is a risk-taking experience that allows the gambler the opportunity to take chances for the sole purpose of winning, and this feature tends to appeal to certain types of individuals.

Social Learning Theory. Social learning theory models view gambling as a learned behavior, learned through imitation, either of an admired figure or from one's peers (Bandura, 1977). Social learning models of gambling suggest gambling falls along a continuum of problem-free to problem-dominated behavior (Brown, 1987). Based on social learning theories, gambling behavior can be reduced because the behavior is learned, and it can also be unlearned

(Lesieur & Rosenthal, 1991). The major strength of social learning theory is it includes the entire population of gamblers, and, therefore, has no artificial distinction between problematic and non-problematic gambling. However, the social learning theory seems to underestimate the power of individual motivation, emotions, and perceptions to influence outcomes, and overestimates the power of external social factors (Brown, 1987).

Cognitive-Behavioral Theory. Cognitive-behavioral theory builds on social learning theory, but focuses on the role cognitive processes play in the acquisition and maintenance of gambling behavior (Ladouceur, Boisvert, & Dumont, 1994). Gambling behavior is acquired through the traditional mechanisms of operant and classical conditioning (Dickerson, 1997; Sharpe & Tarrier, 1993). Once the gambler experiences the thrill of winning, which acts as a positive reinforcement of the behavior, it increases the likelihood the gambler will return to gamble again. Gamblers learn winning will be intermittent, but it will occur, and so they learn to continue gambling despite repeated losses (Sharpe & Tarrier, 1993; Walker, 1992).

Theory of Reasoned Action

Given the importance of analyzing gambling intentions, the present study incorpoated Ajzen and Fishbein's (1977) Theory of Reasoned Action (TRA) as a theoretical framework since the theory explicitly accounts for behavioral intentions. In addition to the theories discussed above, the Theory of Reasoned Action (Ajzen & Fishbein) is a widely accepted and tested behavioral model that examines the determinants of consciously intended behaviors (Davis, 1989). The ultimate goal of the TRA is to predict and understand an individual's behavior. These predictions and understandings have been applied in different fields in order to intervene and promote positive behaviors. The TRA defines three determinants of human behavior: *behavioral intentions*, and its antecedents, *attitudes* and *subjective norms*. The TRA views a person's intention to perform (or not perform) a given behavior as the immediate determinant of the action. Ajzen and Fishbein define behavioral intention as a measure of the likelihood a person will engage in a given behavior.

According to the TRA (Figure 1), a person's behavioral intention is a function of two basic determinants, one personal in nature and the other reflecting social influence (Ajzen & Fishbein, 1977). The personal factor is the individual's positive or negative evaluation of performing the behavior or attitude toward the behavior. Attitudes refer to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question (Ajzen, 1991). The second, social determinant of intention is the person's perception of the social pressures put on him to perform or not perform the behavior in question.

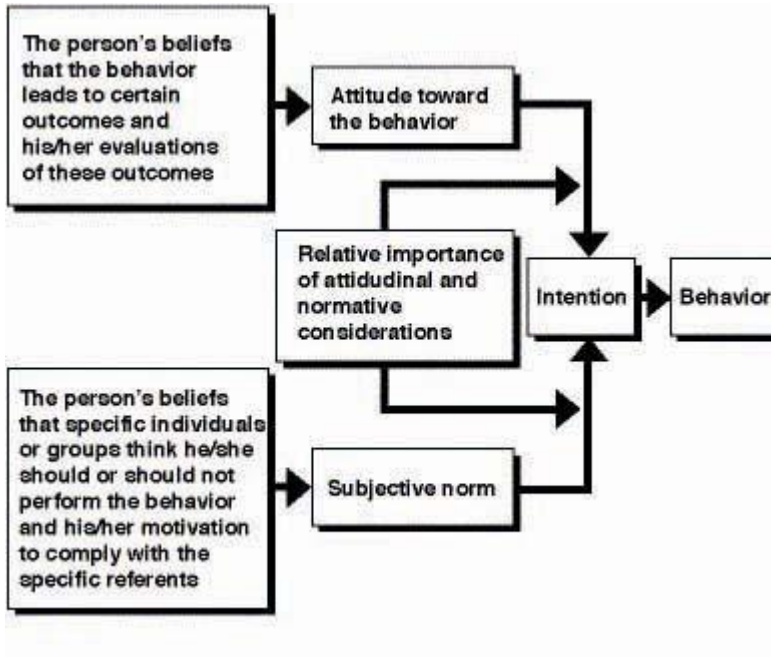

Figure 1. Reasoned Action Model – Azjen & Fishbein, 1977

Prior Usage of the TRA

Researchers have used the Theory of Reasoned Action to study a wide array of human behaviors. Applications vary from attempts to increase safety-belt use (Tramifow & Fishbein, 1994), influence career choice (Strader & Kutz, 1990; Vincent, Peplau, & Hill, 1998), increase condom use for HIV-prevention intervention (Fishbein, Middlestadt, & Tramifow, 1992), and change the process of homelessness (Wright, 1998). Feeley (2003) used the Theory of Reasoned Action to organize the literature on the predictors and correlates of retention of rural practicing physicians.

Moore and Ohtsuka (1997) tested the Theory of Reasoned Action as a model predicting intentions in gambling, gambling behavior, and frequency of gambling. The central hypothesis of the researchers was that attitudes and subjective norms could be used to predict intentions, and intentions in turn could be used to predict behavior. These researchers sought to illustrate the value of the TRA for predicting both gambling problems and gambling frequency. Moore and Ohtsuka recruited 215 Australian volunteers from a psychology booth at the University Open Day, and also from students enrolled in a first year psychology class at an Australian university, ranging in age from

17 to 55 years (Mean age = 22.0, SD = 7.1). The sample contained 58 males and 157 females. The preponderance of females in the sample resulted from their larger numbers as both prospective and actual psychology students, not a response bias (Moore & Ohtsuka). However, it should be noted that the large percentage of respondents who were female could have had an impact on the results of Moore and Ohtsuka's study.

The survey consisted of subsections designed to measure (a) gambling attitudes, (b) subjective norms with respect to gambling (beliefs about attitudes and behaviors of significant others) plus motivation to comply with these norms, (c) gambling intentions and (d) gambling behavior (Moore & Ohtsuka, 1997). These subsections were devised from the guidelines available in previous literature related to the TRA. All of the subsections of the survey were reliable, with Cronbach alphas ranging from 0.69 to 0.87. Cronbach's alpha is a measure of internal reliability or consistency of the items in an index. Cronbach's alpha scores range from 0 to 1.0 and scores toward the higher end of the range suggest the items in an index possess adequate internal reliability (Vogt, 2005).

Moore and Ohtsuka (1997) found most respondents approved of moderate gambling and believed at least some gambling should be legal. However, negative attitudes towards gambling did exist and respondents felt the law needs to set limits on the opportunities to gamble. A large percentage of the respondents in the Moore and Ohtuska study believed that their friends and family approved of gambling, and that gambling occurred among most of the families and friendship groups of the individuals surveyed. Subjective norms were, therefore, perceived vital to predicting gambling behavior. Very few respondents indicated that they regularly gambled; however, more than half of the sample played cards for money, bet on horses/dogs, played poker machines at casinos, or bought lottery tickets. Intention to gamble was moderate, and the respondents were classified as occasional gamblers.

Intention to gamble was significantly predicted by attitudes and subjective norms. The more positive the attitudes toward gambling, and the more positively the norms of significant others to gambling were perceived, the greater the intention to gamble. However, the amount of variance predicted was small, suggesting other factors not assessed in the study might be contributing to gambling intentions. Behavior was strongly predicted by intention, with 30% of the variance accounted for by a combination of intention and subjective norms. However, the subjective norms of significant others were not associated with problem gambling directly.

The aims of the Moore and Ohtuska study were to characterize gambling attitudes and social norms of young adult Australians, evaluate their gambling behavior, and to determine if problem gambling could be predicted by the TRA. Given the promising results of this study, there is a need to analyze the

efficacy of the TRA to explain gambling behavior in a United States based sample. Further, to increase the generalizeability of their results, samples outside the Psychology department in a university setting should be explored.

Purpose of the Study

The purpose of this study was to examine the gambling behavior of college students in the United States. Specifically, this study examined the relationships among gambling attitudes, subjective norms, and gambling intentions on the gambling behavior of U.S. college students. Gambling behavior was assessed in a specific sample with easy access to gambling in order to evaluate the adequacy of the Theory of Reasoned Action (Ajzen & Fishbein, 1977) for predicting college student gambling frequency and problem gambling. In order to examine the efficacy of the TRA to predict gambling behavior among college students, the following hypotheses were generated:

H1: Attitudes related to gambling will significantly and positively predict gambling intentions.

H2: Subjective norms will significantly and positively predict gambling intentions.

H3: Gambling intentions will significantly and positively predict gambling

behavior.

Method

Participants

Participants (N = 345) were recruited from the student population at a university in the Midwest United States with ample gambling opportunities surrounding the campus. These opportunities include legalized pari-mutuel gambling, lottery gambling, charitable gambling, and casino-style gambling. The data were collected in the fall semester of 2005 upon receiving full approval from the University of Louisville Human Subjects Committee.

Students were sampled from courses in the Department of Health and Sport Sciences. These classes were selected because they included students from the freshman through senior level, and it was thought that they may contain relatively equal numbers of both males and females. In addition, these classes also have been popular with athletes at this university, thereby allowing the researchers to obtain a more representative sample of all students at the university.

In order to obtain this sample, the researchers focused on three types of classes. First, a large number of 100-level health classes were chosen. These classes are taken primarily by freshman and sophomores from a variety of majors across the campus. Second, a few sections of a 200-level course that is part of the general education program were selected. These classes also

included students from across the university. These courses included mostly juniors and seniors. Subjects were asked to volunteer for the study after they had been briefed on the study by the researcher. There was no penalty for nonparticipation.

Instrumentation

A panel of experts consisting of researchers and professors possessing doctoral degrees at a premier research-oriented university reviewed the survey for this study to evaluate the content validity of the items. With the exception of the demographic items, all scales had been used in prior research (Lesieur & Blume, 1987; Moore & Ohtsuka, 1999).

Demographics. Demographic questions included age, gender, ethnicity, and class standing.

Gambling Attitude Scale. This measure consisted of 12 items used to predict positive gambling attitudes. The attitude measure of Moore and Ohtsuka (1999) incorporated both the belief and the cost/element of the Theory of Reasoned Action through the use of Evaluative belief statements. All items were arranged with a seven-point Likert-type scale with anchors of *"strongly agree"* on one end and *"strongly disagree"* on the other end. With appropriate reversals, items were summed to produce a scale for which scores ranged from 12 to 84, with high scores representing positive attitudes towards gambling. The Cronbach's alpha reliability for this scale was measured at .79 in Moore and Ohtsuka (1999).

Subjective Norms Scale. This measure consisted of 12 items about perceived family and peer norms with respect to gambling. All items were arranged with a seven-point Likert-type scale with anchors of "*strongly agree*" and "*strongly disagree.*" The family normative beliefs scale and the peer normative scale consisted of seven and five items, respectively. High scores on this measure indicate a perception of positive social norms towards gambling and the desire to fit in with these norms (Moore & Ohtsuka, 1999). In Moore and Ohtsuka's study, the Cronbach alphas were .78 for the family normative beliefs scale and .75 for the peer normative scale. To provide a measure of subjective norms, the normative beliefs items and the motivation to comply items were combined in the manner suggested by Ajzen and Madden (1986), that is, by multiplying the beliefs of each specific referent group (family, friends) by the motivation to comply with those referents. The two measures were added together to form a single measure of subjective norms, with a reported Cronbach alpha reliability of .69 (Moore & Ohtsuka). Scores can range between 12 and 300.

Gambling Intentions Scale. Moore and Ohtsuka's (1999) study provided seven intentions to gamble in the future. For the purposes of the present study, the researcher added eight additional items to measure intentions for the week, the

month, and the year. Items were arranged on a seven-point Likert-type scale with anchor points of "*strongly agree*" and "*strongly disagree.*"

South Oaks Gambling Screen. The South Oaks Gambling Screen (SOGS) is a reliable, valid indicator of gambling problems (Lesieur & Blume, 1987; Volberg & Banks, 1990). The SOGS is scored on a 20-point scale as follows: zero = no problem, one to four = some problems, five or more = probable pathological gambler (Lesieur & Blume, 1987). The SOGS was initially developed and intended for diagnostic use with adults in a clinical setting (Rossen, 2001). The SOGS correlates highly with the Diagnostic Statistical Manual-III-R and the Diagnostic Statistical Manual-IV and has demonstrated validity and reliability among university students (Beaudoin & Cox, 1999; Ladouceur et al., 1994; Lesieur & Rosenthal, 1991).

A wide selection of validation strategies have been employed to demonstrate the validity of the SOGS. These include the use of single-stage (e.g., Gambino, 1997; Poulin, 2002) and multiple-stage (e.g., Abbott & Volberg, 1996; Abbott, Williams, & Volberg, 1999; Gambino, 1999a) designs, a description of the mathematical models for evaluating the accuracy of estimates based on these designs (Gambino, 1997, 1999a), and methods for evaluating the precision and cost-efficiency of these designs (Gambino, 1999b). Other investigators have employed statistical modeling techniques for the purpose of validation, including factor analysis (Winters, Stinchfield, & Fulkerson, 1993), logistic regression (Poulin, 2002; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2001), Rasch analysis (Strong, Lesieur, Breen, Stinchfield, & Lejuez, 2004), and stratification analysis (Tavares, Zilberman, Beites, & Gentil, 2001).

The SOGS was used to measure respondent gambling behavior. The original SOGS was modified from a 20-item scale to a 2-item scale to fit the needs of this study. This approach corresponds with that taken by Moore and Ohtsuka (1999). Research on the performance of the SOGS has shown the lifetime screen is very effective at detecting pathological gambling among those who currently experience the disorder.

The SOGS accomplishes three purposes. First, it provides information on the extent to which the respondents have participated in specific types of gambling activities. Secondly, it gauges the probability the respondent may be a problem or pathological gambler. Finally, the screen provides insights into the respondent's association with gambling. Reliability of the instrument was verified with an internal consistency check showing the SOGS to be highly reliable (Cronbach's alpha = .97, $p < .001$) and a test-retest correlation coefficient yielded a significant ($p < .001$) positive correlation of .71 (Lesieur & Rosenthal, 1991). The Cronbach alpha for this modified scale was 0.87 (Moore & Ohtsuka, 1999).

Data Analysis

Descriptive statistics were calculated for each of the demographic variables. Cronbach alpha coefficients were calculated for the components of each measurement scale to verify internal consistency. Nunnally and Burnstein's (1994) recommended alpha value of .70 was utilized to evaluate the internal consistency of each subscale.

Simple Linear Regression. A series of simple linear regressions were utilized to determine the additive predictive relationships of a selected independent variable on selected dependent variables. For H1, attitudes served as the independent variable and intentions the dependent variable. Subjective norms served as the independent variable and gambling intentions the dependent variable for H2. Finally, for H3, the independent variable was gambling intentions, and the dependent variable was gambling behavior.

Results

Reliability of the Instrument

The instrument used in this study was composed of subscales validated by previous researchers; however, to exercise additional caution, Alpha (Cronbach) coefficients were calculated for each subscale to verify internal consistency. The reliabilities for the Gambling Attitude Scale (α = .810), Subjective Norms Scale (α = .834), Gambling Intentions Scale (α = .900), and South Oaks Gambling Screen (α = .815) exceeded the value of .70 suggested as adequate by Nunnally and Bernstein (1994).

Demographics

The convenience sampling resulted in a total of 345 student participants. The sample was 57.7% male (199) and 42.3% female (146), which somewhat differed from the norm of the student population (43% male and 57% female). This discrepancy is likely a result of the specific classes targeted for sampling in this study, as the majors in the department sampled tend to attract more males than females. The age of the subjects ranged from 18 to 59 with a mean age of 21.0 (*SD* = 3.9 years), and the minimum legal gambling age for all forms of gambling in the state was 18 years. The majority of the sample was White American (78%), with the remainder of the sample as follows: African American (13%), Hispanic American (2%), Native American (2%), Asian American (1%), and Others (4%). The ethnicity of the sample was representative of the 2005 student population at this university as a whole (White American = 78.1%; African American = 11.5%; All other minorities = 10.4%). Approximately 55% of the sample resided in residence halls, 19.1% in apartments, 18.6% in their parent's home, 7% in their own homes, and less than 1% in fraternity or sorority houses. The sample was representative of four class groups with 29.9% freshmen, 14.5% sophomores, 21.5% juniors, and

34.5% seniors. These numbers mirrored the overall student body (30.6% freshmen, 21.6% sophomores, 23.6% juniors, and 28.9% seniors).

Gambling Attitudes and Gambling Intentions

Supporting H1, the results indicated attitudes related to gambling significantly and positively predicted gambling intentions. The R^2 for the regression equation was .050, meaning 5% of the variance in gambling intentions was accounted for by gambling attitudes (Table 1).

Table 1

Summary of Regression Analysis for Gambling Attitudes Predicting Gambling Intentions

Variable	*B*	*SE B*	*β*
Attitude	1.478	.304	.223 *

Note. $R^2 = .05$
* $p < .05$

The results indicated that the more positive the attitude toward gambling, the greater the intention to gamble. However, the variance predicted was low, indicating that other factors might be more important in predicting intention to gamble among college students.

Subjective Norms and Gambling Intentions

The results indicated subjective norms significantly and positively predicted gambling intentions, thus providing support for H2. The R^2 for the regression equation was .023, meaning just over 2% of the variance in gambling intentions was accounted for by subjective norms (Table 2).

Table 2

Summary of Regression Analysis for Subjective Norms Predicting Gambling Intentions

Variable	*B*	*SE B*	*β*
Subjective Norms	.187	.066	.151 *

Note. $R^2 = .02$
* $p < .05$

Gambling Intentions and Gambling Behavior

H3 proposed gambling intentions would significantly and positively predict gambling behavior in terms of specific types of gambling activities. As shown in Table 3, the hypothesis was supported; however, the percentage of variance predicted (2%) was relatively low.

Table 3

Summary of Regression Analysis for Gambling Intentions Predicting Gambling Behavior

Variable	*B*	*SE B*	*β*
Intention	.352	.134	.140*

Note. $R^2 = .02$
* $p < .05$

Discussion

While the effect sizes were in the small to medium range, a large portion of the variance in gambling intentions and gambling behavior was not predicted by the independent variables (subjective norms and gambling attitudes). It is possible this result may have occurred because students did not always answer honestly. Even though the responses were confidential, students may have had some incentive to intentionally reduce their reported gambling intentions and behavior. This may have been particularly a concern for student-athlete respondents because of the NCAA rules on student-athlete gambling. Future research should try to better control for socially desirable answers to determine if this explanation is accurate. In general, the differences in the results of the two studies regarding the usefulness of the TRA suggest the need for more research to determine what may increase or decrease this usefulness.

In addition, it is also possible that the TRA is a better model than appears to be the case based on the results of the current study. One could speculate that each specific type of gambling (i.e., pari-mutual gambling, lottery playing, casino-style gambling, etc.) may need its own instrument to ensure respondents are reporting attitudes, intentions, subjective norms, and behaviors with regards to the same, specific gambling type. Gamblers are attracted to different forms of gambling for different reasons (Brown, 1987; Grahm & Lowenfeld, 1986; Lesieur & Rosenthal, 1991; Selzer, 1992; Sharpe & Tarrier, 1993; Walker, 1992). Some are attracted to the sensory stimulation of video games of chance, while others to the perception of skill in cards or sports betting. Still others are drawn to the seemingly easy money of high-risk investments. Many, if not most, pathological gamblers indulge in more than one form of gambling.

However, studies of pathological gamblers have found that the most frequently cited games of preference are slot machines, card games, and sports betting. A Minnesota study of 944 gamblers in treatment found that 37 percent listed slot machines as their preferred game and 37 percent listed cards. Lottery games, dice games, and games of skill were each cited by less than 1 percent of those in the study (Stinchfield & Winters, 1996).

The existing research on college students notes the majority participated in some sort of casino gambling, such as slot and video poker machines (Lesieur & Rosenthal, 1991). Winters, Bengston, Dorr, and Stinchfield (1998) found that college students preferred casino-style gambling, followed closely by the lottery. However, Hira and Monson (2000) indicted the lottery as the number one gambling activity of college students.

Because different types of gambling may appeal to different people for different reasons, examining general gambling attitudes, subjective norms, intentions, and behavior, as was done in the current study, may result in a less predictive model. Specifying the type of gambling when measuring respective attitudes, subjective norms, intentions, and behavior may result in a more predictive model that would be very useful to gambling researchers. In fact, Ajzen and Fishbein (1977) noted the Theory of Reasoned Action was limited by the degree of correspondence between the factors. In order for the theory to predict behavior, attitude and intention must agree on action, target, context, and time.

Another limitation of this study comes from the nature of the self-reporting used to determine a subject's attitudes (Dillman, 2000). No direct observation is used in the application of this theory; only self-reported information was used. Self-reported data contain several potential sources of bias, such as selective memory (remembering or not remembering experiences or events that occurred sometime in the past), telescoping (recalling events that occurred at one time as if they had occurred at another time), and attribution bias (attributing positive events and outcomes to one's own agency while attributing negative outcomes to external forces) (Kruger & Dunning, 1999).

Although the greatest limitation of the TRA generally stems from the assumption that behavior is under volitional control, this would not appear to be an issue in this case. In fact, this aspect would suggest that gambling could be examined using the TRA, because gambling behavior is usually thought out before the actual behavior is performed. Cummings and Corney (1987) argued the TRA would have good explanatory power when examining gambling phenomena and would provide a methodological framework for measurement of social factors likely to affect gambling behavior. Later, Moore and Ohtsuka (1999) found the TRA was a useful model for examining the gambling behavior of Australian students, and the model predicted a large portion of

variance. Therefore, the use of a psychosocial model such as the TRA for predicting gambling behavior would appear to be beneficial to the field of gambling research.

The implications of this study are similar to the same moral issues and policy dilemmas which face society with respect to alcohol, cigarettes, drugs, irresponsible sexual behavior, eating disorders, and other potentially harmful activities of college students. While college administrators may have little control over the subjective norms of their students outside of establishing a campus culture, they could still impact gambling intentions by developing strategies for changing student attitudes toward gambling. These strategies may include providing students with awareness, information, and education on the possible problems associated with gambling. Other possible strategies include screening the college students upon initial enrollment to determine if these types of addictions are present in their current lives, referring potential problem gamblers to proper help lines, and providing treatment to the students with problem gambling. For example, sponsoring and condoning popular campus activities such as "casino night" should be avoided as such a practice may positively impact students' attitude toward gambling.

Conclusion

As cited by Lesieur and Rosenthal (1991), Bourn (1998), Moore and Ohtsuka (1997), and Rockey, Beason, Lee, Stewart, and Gilbert, (1997), college students are two to three times more likely to develop pathologic gambling problems than the adult population in general. It is therefore necessary to conduct research into the most effective method to educate college students on the perils of addictive gambling behavior. University student affairs offices need to develop educational programs to help students cope with the increasing availability of gambling opportunities across America. Based on the results of the present study, these educational programs should introduce interventions to positively change attitudes toward gambling as well as highlight the influences of friends and family. After the introduction of these educational programs, research should be developed to determine the effectiveness of treatment programs for problem gambling on the college campus. College administrators must be willing to appropriate the funds to initiate the programs necessary to combat this problem. However, Bailey and Dickens (1997) found the student affairs profession has not yet recognized gambling as an issue needing immediate attention.

Acknowledging the existence of the gambling problem is the first step to overcoming the issue on America's campuses. Today's college students are the first generation of youths to grow up in a culture of widespread legalized gambling and its promotion (Shaffer, Hall, Vander Bilt, & George, 2003; Stinchfield, Hanson, & Olson, 2006). Developing a theoretical framework

which can be used consistently across studies is needed to provide further research. The present study found significant results by using the TRA to explain gambling behavior, however, the amount of variance explained was quite modest. Future studies might consider how the inclusion of other variables (e.g., intrinsic motivation, locus of control, etc.) could enhance the ability of the TRA to explain the intentions, attitudes, and behaviors of college students. With the advent of gambling access via the Internet, today's college students have more gambling opportunities than ever, and more research is needed to develop strategies to deal with this problem on our nation's campuses.

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