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Personal And Social Factors In Risk-Taking Behaviors Of Emerging Adults

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DEDICATION

To my darling granddaughters,

Isabelle Katherine and Hannah Evelyn,

whose sweet presence inspired my perseverance.

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CHAPTER 1

INTRODUCTION

Background

The transitional period from adolescence to young adulthood is defined as the stage of life that begins at the conclusion of high school and ends with the acceptance of adult roles (i.e., career, marriage, parenthood; Arnett, 2000). Arnett's theory of "emerging adulthood", a phenomenon that has developed in industrialized countries in the last 50 years, lasts from approximately 18 to 25 years of age. Arnett holds that it is a discrete developmental period distinct from adolescence and adulthood in several salient ways; demographically (e.g., changes of residence and work, freedom from constricting social roles), perceptions of adulthood, and a lengthy period of identity exploration before making lasting decisions about a romantic partner, career, and worldview (Arnett, 2007). Accompanying the increased opportunities for growth are greater demands on emerging adults' ability to adjust to substantial changes in their lives (e.g., degree of freedom, parental monitoring and involvement, academic demands, social setting, peer group, and exposure to increased opportunities to engage in risk behaviors such as the use of alcohol, use of other drugs, and sexual activity).

Risk taking behavior is conceptualized as behavior that increases the probability of negative consequences – health, social, and legal (Perkins, 2002b). The focus of the proposed study is on college students' excessive use of alcohol and other drugs and participation in high-risk sexual activity and the association between those behaviors and sensation seeking, peer influence, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior.

During emerging adulthood "prevalence is highest for most types of drug use" (Arnett, 2005, p. 235). The National Survey on Drug Use and Health (Substance Abuse and Mental

Health Services Administration [SAMHA], 2011) reported 70% of individuals 21 to 25 years of age used alcohol in the month prior to completing the 2010 survey, a higher rate than any other age group. Emerging adults reported the highest rates of drug abuse. The highest percentage of illicit drug users during the same time frame was in individuals 18 to 20 years of age (23.1%) and followed by the group from 21 to 25 years of age (20.5%). Binge drinking (i.e., consumption of 4 or 5 drinks or more on one occasion for females and males respectively) was highest in individuals 21 to 25 years of age (45.5%) and second highest in individuals 26 to 29 years of age (37%) followed by the group 18 to 20 years of age (33.3%). Full-time college students 18 to 22 years of age were more likely to use alcohol in the past month, binge drink, and drink heavily than their part-time college and not currently enrolled peers. In 2010, the rate of illicit drug use by full-time college students was 22% of students 18 to 22 years of age, similar to the rate (23.5%) of others in their cohort (SAMHA, 2011).

Since the early 1990s, rates of excessive drinking (i.e., heavy episodic drinking, binge drinking) among college students have been increasing (Wechsler, Lee, Nelson, & Kuo, 2002)., The National Center on Addiction and Substance Abuse at Columbia University (2007) reported an increase in college students' use of both illicit drugs (e.g., marijuana, cocaine, heroin, ecstasy), and prescription drugs (e.g., painkillers, stimulants, tranquilizers). Becoming intoxicated or "high" has been associated with the likelihood of engaging in risky sexual behavior (e.g., sexual contact with casual or multiple partners and failure to use protection against sexually transmitted diseases [STDs]; American College of Health Association [ACHA], 2006; Cooper, 2002).

The development of Arnett's (2000) theory, emerging adulthood, as a developmental period distinct from adolescence and young adulthood has catalyzed much interest in this developmental stage. Within the structure of the theory, emerging-adulthood, researchers have an

opportunity to investigate the distinctions between adolescence, emerging-adulthood, and young adulthood (the period from 30 to 45 years of age; Arnett & Tanner, 2006). It is important to study emerging-adulthood to investigate the developmental characteristics of the period (e.g., forming an identity, determining values and beliefs, choosing an area of study, establishing an occupation, finding a love relationship (Arnett, 2004) and how they relate to the health and well-being of emerging adults (Arnett, 2005). Understanding the role of alcohol and drug use in the lives of emerging adults during the multiple transitions of the period would enhance the discovery of etiologies and ways to make positive changes (Schulenberg & Maggs, 2002). Emerging adulthood is a time of increased risk for a substantial number of individuals.

Studies of risk taking behavior among college students have reported serious negative effects, such as decreased level of academic achievement (Grant, Harford, & Stinson, 2001), occupational attainment (Wood, Sher, & McGowan, 2000), impaired driving, sexual coercion, violence, legal problems (Perkins, 2002b), unintentional injuries and death (Hingson, Zha, & Weitzman, 2009), and an increased risk of developing alcohol or drug dependence or abuse (Knight, Kuo, Schuckit, Seibring, & Weitzsman, 2002; Hingson, Heeren, Zakocs, Winter, & Wechsler, 2003).

A number of variables have been found to predict risk taking. The purpose of the study is to examine the relation between emerging adult college students' risk taking behavior (alcohol, drugs, sex) and intrapersonal factors unique to the individual, specifically sensation seeking, perceived peer risk taking, general resistance to peer influence, self-regulatory efficacy to resist risky behavior, and emotion regulation. Additionally, gender differences have been found in prior research (Sumter, Bokhurst, Steinberg, & Westenberg, 2009; Carlson, Johnson, & Jacobs, 2010), and thus, gender was considered an independent variable in the study. The following sections discuss the variables in the study that are expected to be related to risk taking behavior.

Sensation Seeking

Sensation seeking has been defined as a personal trait characterized by individuals' need for novelty and intense sensory stimulation (Arnett, 1994a; Zuckerman, 1990). Risk taking behavior may be a consequence of the need for increased stimulation. Risk taking provides opportunities for new and exhilarating activities that inherently have a degree of danger (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993).

According to Steinberg (2009), risk taking is higher in adolescence because sensation seeking is high and self-regulation is immature. During adolescence and into young adulthood, the development of two brain networks converge increasing individuals' vulnerability to risk taking behaviors. First, the socioemotional system develops early and suddenly. This system increases reward-seeking, regulates emotional arousal, susceptibility to peer influence, and processes social information and reward sensitivity (Steinberg, 2008). During this period, reward sensitivity becomes acutely sensitized to social and emotional stimuli particularly in the presence of peers and induces adolescents to seek novel experiences that provide higher levels of stimulation (Steinberg, 2008). Secondly, the cognitive-control system processes self-regulation abilities and executive functions (e.g., response inhibition, delay of gratification, planning, and foresight (Steinberg, 2004). The cognitive-control system also develops slowly and does not reach maturity until the mid-20s. The juxtaposition of the socioemotional and the cognitive-control systems during adolescence creates a "perfect storm" for increased vulnerability to involvement in risk taking behaviors (Steinberg, 2004).

In agreement with Bronfenbrenner's ecological theory of development, Bandura's social learning theory posits a prominent role for the environment. However, social learning theory includes a strong emphasis on the interaction between individuals and their environment. Human agency, a fundamental tenet of social learning theory, posits that individuals are proactive agents

who act on their environment and who have to some extent, the ability to control their thoughts, feelings, behaviors, and motivation (Bandura & Bussey, 2004; Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001). Bandura's triadic model of behavior (i.e., the reciprocal theory of determinism) holds that development occurs in continuous bi-directional interaction between personal factors (e.g., genetics, temperament, thoughts, feelings), behavioral factors, and environmental factors (Bandura, 2002; Jessor & Jessor, 1977).

Individuals who have the personality trait of high sensation seeking are at risk to engage in risk taking behavior. Researchers have found a relation between sensation seeking and risk taking behaviors. High sensation seekers may be more vulnerable to biological changes than low sensation seekers (Horvath & Zuckerman, 1993). High sensation seekers, when compared to low sensation seekers, predict that they will experience less anxiety in risky situations, increasing the likelihood that they will engage in novel, exciting, exhilarating risky activities (Zuckerman & Kuhlman, 2000). High sensation seekers may be more likely than low sensation seekers to attend parties that afford opportunities for drinking and initiating sexual activities (Zuckerman & Kuhlman). Sensation seeking was significantly related to reckless driving, illegal drug use, risky sexual behavior, and criminal behavior (Arnett, 1996). Sensation seeking was positively related to risk taking behaviors; smoking, drinking, drugs, sex, driving, and gambling (Zuckerman & Kuhlman, 2000). Hoyle, Fejfar, and Miller (2000), in a review of 53 studies, found that sensation seeking predicted risky sexual behaviors (i.e., number of partners, unprotected sex, sex with a stranger). Sensation seeking is an intrapersonal factor that has been shown in prior literature to be strongly related to risk taking behavior thus, it is plausible that in the present study sensation seeking will have a relation to risk taking behavior. Sensation seeking will be a key predictor variable in the present study.

Peer Influence

A large number of factors have been found to be related to risk taking in adolescence, including impulsivity (Kahn, Kaplowitz, Goodman, & Emans, 2002), temperament, sensation seeking, early maturation, availability, and opportunity (Steinberg, 2008), self-regulation (Hustad, Carey, Carey, & Maisto, 2009), parenting style (Coley, Votruba-Drzal, &Schindler, , 2009), parental monitoring (Romer et al., 1994), the presence of peers (Gardner & Steinberg, 2005), as well as family history, hyperactivity, and academic failure (Hawkins, Catalano, & Miller, 1992). Empirical evidence has shown that peers have a powerful influence on adolescents' and emerging adults' behavior. For the purposes of this study, peer influence is defined as individuals' perceptions of the type and frequency of risk taking behavior (drinking, drugs, sex) in which their peers are engaged.

Adolescence and emerging adulthood are developmental periods characterized by the increased importance of peers as individuals are forming an identity and establishing relationships with peers (Erikson, 1963). According to Bronfenbrenner's ecological theory, there are five environmental systems that influence individuals' development (1994). One of them is the microsystem comprised of the immediate environment in individuals' lives; family, neighborhood, school, peers, religious institutions, and health services. From an ecological perspective, peers are both proximal and distal influences on individuals' development. Compared to adults, adolescents and emerging adults spend more time in groups (Steinberg, 2008) where adolescent risk taking has been shown to be more likely to occur (Brown, Clasen, & Eicher, 1986).

Research on college students has shown a significant positive correlation between students' perceived social norms and both their own drinking behavior (Clapp & McDonnell, 2000; Martens et al., 2006) and frequency of sexual intercourse in the last month (Page,

Hammermeister, & Scanlan, 2000). In a review of studies, Perkins (2002a) found that the strongest influence on students' personal drinking behavior was peer norm perception, with the heaviest drinking among the more socially integrated students. One of the strongest predictors of adolescent alcohol or illicit drug use was found to be the degree to which peers use these substances (Chassin et al., 2004). Adolescents are more likely to be sexually active when their peers are (East, Felice, & Morgan, 1993; Romer, 1994) and when they perceive their peers to be sexually active whether they are or not (Babalola, 2004; Prinstein, Meade, & Cohen, 2003). The risk taking behavior of individuals' peers is a microsystem factor that affects individuals in their environment. Prior research has shown that individuals' perception of their peers' risk taking behavior is strongly related to their own risk taking behavior. Thus, it is plausible that peer influence will have a relation to risk taking behavior in the present study. Perception of peers' risk taking behavior will be key predictor variable in the current study.

Potential Mediating Variables

General resistance to peer influence, emotion regulation, and self-efficacy to resist risk taking behavior have been found to be related to risk taking behavior. However, they may or may not mediate the relation between sensation seeking and risk taking behavior and between perceived peer risk taking behavior and risk taking behavior. Part of the purpose of this study is to examine their potential roles as mediators between sensation seeking and risk taking behavior and between peer influence and risk taking behavior. Bronfenbrenner's ecological theory and Bandura's social learning theory support the notion of a potential mediating role for these variables. Each variable influences individuals' behavior in response to internal and environmental stimuli. In the present study, these variables are expected to mediate between sensation seeking and risk taking behavior and between peer influence and risk taking behavior.

These theoretical notions, as well as other empirical support are explored in the following three sections.

Emotion regulation. The ability to self-regulate emotion and behavior is central to good psychosocial functioning. Researchers have used various terms for the self-regulation of emotion including: self-control (Wills & Stoolmiller, 2002), self-regulation (Bandura, 1986, 1997; Wills, Walker, Mendoza, & Ainette, 2006), and social self-control (Pokhrel, Sussman, Sun, Kniazer, & Masagutov, 2010). For the purposes of this study, emotion regulation was used.

There is no agreed upon definition of self-regulation of emotion. Nonetheless, common to most of the definitions is the ability to regulate attention, thoughts, emotions, and behaviors in order to meet the demands of a particular situation (Quinn & Fromme, 2010; Raffaelli & Crockett, 2003), to adapt in the context of emotionally salient events (Gratz & Roemer, 2004), and to monitor, evaluate, and modulate emotional reactions for goal-directed behavior (Thompson, 1994). It encompasses focusing and shifting attention, monitoring behavior, considering consequences, and alternative actions before acting (Bandura, 1997; Carver & Scheier, 1998; Miller & Brown, 1991), restraining or changing one's responses to function adaptively and socially behave in an acceptable manner (Baumeister, Dewall, Ciarocco, & Twenge, 2005).

Emotion regulation has been associated with risk taking behavior. In heavy drinking college students, self-regulation was inversely related to the amount of initial alcohol-related consequences and rate of change in alcohol-related consequences (Hustad, Carey, Carey, & Maisto, 2009). Quinn and Fromme (2010) found that poorer self-regulation significantly predicted heavy episodic drinking, alcohol-related problems, and unprotected sex with a non-monogamous partner. A significant negative relation between self-regulation and number of sex partners and condom use was reported by Raffaelli and Crockett (2003). Among sexually active

youth, self-regulation predicted the number of sexual partners. Specifically, increased self-regulation was significantly associated with having fewer sex partners (Bandura et al., 2003).

According to social learning theory, self-regulation is critical to individuals' adaptive functioning. Self-regulation is a salient feature of human agency (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003) as individuals are considered proactive, self-regulating agents actively involved in their own development not just passively being affected by their social environment (Bandura, 1986, 1997). According to Steinberg (2008), emotion regulation is an intrapersonal factor that affects individuals' responses to internal stimuli such as emotional arousal, susceptibility to peer influence, and reward sensitivity and to external environmental stimuli such as social information (e.g., what their peers are doing and what they think their peers are doing) that induce them to seek new experiences that give them higher levels of stimulation. Perceptions and/or observations of what their friends are doing can stimulate individuals' emotional arousal and desire to experience the sensory rewards that their peers are experiencing (Steinberg, 2008).

In the present study, emotion regulation is conceptualized as a multi-dimensional construct involving; the willingness to be aware of emotions, understand, and accept them; in response to negative emotions, the ability to perform goal-directed behaviors while inhibiting impulsive behaviors; the ability to moderate the intensity and length of emotional responses rather than suppressing them; the willingness to accept that negative emotions accompany the pursuit of meaningful life activities (Gratz & Roemer, 2004). The concept that emotion regulation is related to behavior involves the notion that individuals with high levels of emotion regulation will be less likely to engage in maladaptive behaviors. It is reasonable to posit that the degree to which individuals are able to regulate their responses to peer behavior information in regard to emotion regulation, arousal, susceptibility to peer influence, and sensory reward

seeking may be related to their choices of behavior. In the present study, it is plausible that emotion regulation may mediate the relation between sensation seeking and risk taking behavior and between perceived peer influence and risk taking behavior.

General resistance to peer influence. Resistance to peer influence is considered the degree of susceptibility individuals have to following the goals of their peers rather than their own goals (Sumter, Borkhorst, Steinberg, Weston, & Berg, 2009). Resistance to peer influence has been found to increase linearly with age (Gardner & Steinberg, 2005; Monahan, Steinberg, & Cauffman, 2009); however, the ability to resist peer influence may still be developing in emerging adults (Gardner & Steinberg, 2005). In a study of risk taking behavior among adolescents, emerging adults, and adults, Gardner and Steinberg (2005) found that emerging adults' resistance to peer influence was higher than adolescents' resistance, but emerging adults were more susceptible to peer influence than adults.

Researchers have found a relation between resistance to peer influence and risky behavior. In a study of adolescents, peer conformity disposition (willingness to acquiesce to peer influence) was significantly related to risky behavior (e.g., smoking, drinking, drug use, sexual activity, stealing; Brown, Clasen, & Eicher, 1986). In a sample of adolescents and emerging adults 14 to 22 years of age, Monahan et al. (2009) found that individuals who were more resistant to peer influence reported less antisocial behavior compared to those who were less resistant to peer influence. In the same study, the influence of anti-social friends had a significant inverse relation to resistance to peer influence to engage in antisocial behavior (Monahan et al., 2009). Among a population of juvenile offenders 14 to 17 years of age, the influence of anti-social friends persisted longer for those who showed lower resistance to peer influence compared to those with higher resistance to peer influence (Monahan et al., 2009).

According to social learning theory, individuals learn vicariously from modeled behavior, with peer models being especially powerful because they are most like the observer (Bandura, 1986). Individuals who have a greater likelihood of following the goals of their peers instead of their own goals may be more influenced by their perceptions of their peers' behavior and may be more likely to engage with their peers in sensation-seeking behavior and risk taking behavior. It is plausible that in the present study general resistance to peer influence may mediate between sensation seeking and risk taking behavior and between perception of peers' risk taking behavior and risk taking behavior.

Self-efficacy to resist risky behavior. The following section begins with a short explanation of social learning theory's concept, self-efficacy. A major tenet of social learning theory, self-efficacy, is the belief that individuals have in their ability to successfully perform a task or behavior (Bandura, 1986). According to social learning theory, individuals interact bi-directionally with their environment influencing the social system and being influenced by it (Caprara, Regalia, & Bandura, 2002). As personal agents, individuals are proactive in their own development. They organize and regulate themselves and are not merely influenced by social factors (Bandura, 1986). Self-efficacy beliefs are central to individuals' ability to act on their environment. Self-efficacy beliefs determine whether or not individuals will attempt a task, the degree of effort expended, and the length of perseverance. Self-efficacy beliefs are specific to a particular task or situation and do not generalize to other tasks or contexts. From the perspective of social learning theory, individuals' self-efficacy beliefs are central to self-regulation and life management (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003).

Self-regulatory efficacy is conceptualized as adolescents' perceptions of their self-efficacy to regulate their behavior in line with their personal standards in the face of peer influence (Caprara, Barbaranelli, Regalia, Cervone, 2004). Researchers have found an

association between individuals' self-regulatory efficacy beliefs and their ability to resist engaging in risky behavior. Adolescents with high perceived self-regulatory efficacy to resist peer influence to engage in risk taking behavior showed low involvement in delinquent behavior (e.g., the use of alcohol, drugs, sexual activity, and other risk taking activities) concurrently and two years later (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001). High self-regulatory efficacy to resist peer pressure for risky behavior was inversely related to engaging in delinquent activities and substance use (Caprara, Regalia, & Bandura, 2002). Adolescents' perceived self-efficacy to fend off negative peer influence was inversely related to delinquent conduct and substance abuse (Caprara, Barbaranelli, Pastorelli, Regalia, & Bandura, 1998).

Because individuals' belief in their ability to regulate their emotions and behaviors influences what they do, how they respond to others, their susceptibility to peer influence, and the paths they choose at crucial points in their lives (Bandura et al., 2003), their self-efficacy beliefs are likely to affect their emotions, behavior, and choices when they are in situations where they are faced with peers' sensation seeking behavior and risky behavior. Their self-efficacy beliefs in regard to their self-regulation to resist risky behavior may influence their decisions to avoid or to join their peers in these behaviors. Based on social learning theory's concepts of vicarious learning and self-efficacy, it is plausible that self-efficacy to resist risky behavior may mediate between sensation seeking and risk taking behavior and between perceived peer influence and risk taking behavior.

Summary

The occurrence and deleterious effects of risk taking behaviors among emerging adults have been established in previous research that has found associations between risk taking behavior and many variables, such as sensation seeking, perceived peer risk taking behavior,

general resistance to peer influence, emotion regulation, and self- efficacy to resist risky behavior. Nonetheless, psychosocial and individual factors that may be contributing to risk taking have not been fully investigated. The combination of factors in this study has not been investigated in prior research. The present study examined the relation between risk taking behaviors (drinking, drugs, sex) among emerging adult college students at a large urban university and sensation seeking, perceived peer risk taking behavior, general resistance to peer influence, self-efficacy to resist risky behavior, and their emotion regulation. The role of several variables as mediators also is proposed here.

The following research questions were addressed in this study:

1. (a) What is the combined strength of sensation seeking, perceived peer risk taking behavior, emotion regulation, general resistance to peer influence, and self-efficacy to resist risky behavior in explaining the variance in risk taking behavior in regard to alcohol use, drug use, and sexual activities?

(b) What is the relative contribution of each variable – are some stronger predictors than others?

2. Does emotion regulation mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?

3. Does general resistance to peer influence mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?

4. Does self-efficacy to resist risky behavior mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?

The level of sensation seeking, perceived peer risk taking behavior, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior are hypothesized to predict emerging adult undergraduate college students' risk taking behaviors in regard to alcohol

use, drug use, and sexual activities. Emotion regulation is expected to mediate the relation between risk taking behaviors of emerging college students in a large urban university and sensation seeking and perceived peer risk taking behavior. General resistance to peer influence is expected to mediate the relation between sensation seeking and risk taking behaviors of emerging college students in a large urban university and perceived peer risk taking behaviors and risk taking behaviors of emerging college students in a large urban university. Self-efficacy to resist risky behavior is hypothesized to mediate the relation between risk taking behaviors of emerging college students in a large urban university sensation seeking and perceived peer risk taking behavior.

Significance of the Study

Emerging adult college students have the academic ability, study skills, motivation, and diligence to have earned admission to a higher educational institution and are ostensibly on a positive life course that may be jeopardized by vulnerability to participation in excessive risk taking behavior. The consequences of risk taking behavior can be profound, derailing a positive developmental pathway and even resulting in death. Identifying psychosocial and intrapersonal factors related to college students' risk taking behavior and the role they play in the decision to engage in risk taking behaviors may be important in decreasing the effects of the biopsychosocial influences on emerging adults' risk taking behavior. In particular, if mediators of sensation seeking and peer influence can be identified, there is potential for more targeted and effective interventions. Greater understanding of the developmental stage involving the transition from adolescence to adulthood may inform the design of treatment modalities to decrease risk taking behaviors in emerging adult college students. Study findings may influence treatment goals of health and mental health professionals who work with the emerging adult college student population.

CHAPTER 2

LITERATURE REVIEW

Overview

Prior research has investigated factors associated with risk taking behavior in adolescents and emerging adults. Risk taking behaviors have been found to be a problem among emerging adult undergraduate students 18 to 25 years of age (Hingson, 2010; Miller, Furr-Holden, Voas, & Bright, 2005). This chapter presents a comprehensive overview of the literature that has explored risk taking behavior; alcohol abuse, illicit drug use, and risky sexual activities in emerging adult undergraduate college students. The literature review consists of five sections regarding the relation between risk taking behavior and sensation seeking, peer influence, general resistance to peer influence, emotion regulation, and self-efficacy to resist risk taking behavior.

Sensation Seeking

Sensation seeking has been investigated by scientists and researchers for more than a century. A prominent researcher, Zuckerman (1994) defined sensation seeking as "a trait defined by the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal and financial risks for the sake of such experiences" (p. 27). According to Zuckerman and Cloninger (1996), the sensation seeking construct, in some form, is found in models of personality; the psychoticism dimension of personality in the big three factor model (Eysenck, 2006), the novelty seeking factor in the tridimensional model of temperament (Cloninger, 1987a), the conscientiousness factor in the big five (Costa & McCrae, 1992), and the impulsive sensation seeking (ImpSS) subscale of the alternative five (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). Zuckerman (1994, 2007) posited that basic personality traits have developed through evolution and through the interaction of genes and biological mechanisms with a consistent experience in the environment.

Theories associated with sensation seeking. Freud's drive theory of sensation seeking asserts that sensation seeking originates in tensions within the brain and pleasure is derived by reducing the drive (Freud as cited in Rosenbloom 2003; Zuckerman 1994). The optimum level of arousal (OLA) theories posited a point of stimulation that was the most pleasurable and other levels that were either above or below that point of stimulation were less pleasurable, even unpleasant. People who needed more stimulation, such as high sensation seekers, would have a higher optimum level of arousal than those needing less stimulation, low sensation seekers (Zuckerman, 1994, 2007). The theory of sensation seeking by Eysenck (2006) regarded sensation seeking as a component of the optimal level of extraversion.

Research in the 1950s found that the reticular activating system (RAS) played a role in the regulation of arousal in the cortex (Zuckerman, 1994, 2007). This finding provided a neurological basis for the OLA theory. Research on sensation seeking began using measures of heart rate and skin conduction (Graham, as cited in Zuckerman, 1994), sensory deprivation (Zuckerman et al., 1966), visual stimulation (Buchsbaum & Silverman, 1968), and auditory stimulation (Zuckerman, Simons, & Como, 1988). Gray's (as cited in Zuckerman, 1994) personality theory was based on neurophysiological studies on rats. Gray's studies linked animal models for impulsivity, anxiety, and aggression to these human personality traits. Gray proposed that three behavioral systems ─ the behavioral approach system (BAS), the behavioral inhibition system (BIS), and the fight or flight system (FFS) ─ had neurological systems and that specific personality traits connected to each system.

Zuckerman and Cloninger (1996) considered novelty seeking and sensation seeking as "a fundamental dimension of temperament" (p. 284). Some sensation seekers engage in stimulating activities that do not include risk, such as listening to hard rock/rap music; watching thrilling, frightening, suspenseful, violent, or erotic movies; or socializing with unique people

(Zuckerman, 2007). Other activities involve risk, such as: extreme sports; mountain climbing, sky diving, and bungee jumping. Most high sensation seekers view their activities as not so risky because they are confident that the precautions they take, for example, checking climbing equipment, can assure their safety. Most high sensation seekers are looking for the reward, the arousal, rather than the risk, but are willing to take the risk to achieve the reward. Risk taking behavior is a correlate of sensation seeking and not inherent in the trait (Zuckerman, 2007).

High and low sensation seekers. Some sensation seekers engage in risk taking behaviors (e.g., binge drinking, drinking and driving, using illicit drugs, unprotected sex, and sex with multiple and casual partners). High sensation seekers, when compared to low sensation seekers, have a higher tolerance for risk. After engaging in a risky activity with no negative consequences, high sensation seekers' risky behavior is reinforced and they become more confident appraising the activity as less risky (Horvath & Zuckerman, 1993; Hoyle, Fejfar, & Miller, 2000). High sensation seekers evaluate activities, even those they have never done, as less risky than low sensation seekers (Hovarth & Zuckerman, 1993). Compared to low sensation seekers, high sensation seekers expect to have less anxiety if they were to engage in the activity (Zuckerman & Kuhlman, 2000). Low sensation seekers tend to be more sensitive to the risk in situations and predict that they would experience anxiety rather than elation if they were to participate. Low sensation seekers do not relate to the reward that high sensation seekers derive from an activity. The stable characteristic among sensation seekers is the desire for change (Zuckerman & Kuhlman).

Using a sample of 75 Bar-Ilan University students, 20 to 27 years of age, Rosenbloom (2003) found a significant negative correlation between scores on the Sensation Seeking Scale - V (SSS-V; Zuckerman, 1994) and the risk evaluation questionnaire. High sensation seekers appraised risks lower than low sensation seekers. A significant positive correlation emerged

between scores on the SSS-V and on the risk taking questionnaire. High sensation seekers were higher than low sensation seekers on the risk taking questionnaire. Using a repeated measures ANOVA with levels of sensation seeking as the independent variable and levels of risk taking and risk evaluation as the dependent variables, a statistically significant interaction was found between levels of sensation seeking and risk taking and risk evaluation. High sensation seekers were more likely to take risks than low sensation seekers. Low sensation seekers evaluated levels of risk in risk taking behavior higher than high sensation seekers (Rosenbloom, 2003).

Sensation seeking and biochemical correlates. Influenced by Gray's (as cited in Zuckerman, 1994) sensation seeking theory of three behavioral systems, Zuckerman's (1995, 2007) sensation seeking model is a biosocial-biochemical model that consists of three basic behavioral systems; approach, inhibition, and arousal systems and the biological bases that underlie them. Zuckerman posited (a) an approach and impulsive tendencies system that is mediated by the dopamine system, (b) a behavioral inhibiting influence system that is mediated by the serotonergic system, and (c) an arousal system that is mediated by the noradrenergic system. Interaction occurs among the systems and among the neurotransmitters associated with them. Interactions among these three neurotransmitters are thought to influence sensation seeking (Zuckerman).

Generally, high levels of sensation seeking have been associated with high levels of dopamine and stronger reactivity of dopamine receptors (Netter & Rammsayer, 1991; Stuettgen, Henning, Reuter, & Netter, 2005; Zuckerman, 1994) and lower levels of norepinephrine (Gerra et al., 1999) and serotonin (Ruegg et al., 1997).

Research has explored the relation between the sensation seeking personality trait and biochemical processes in the human body. Biochemical studies have found an association between sensation seeking and plasma levels of gonadal hormones (e.g., testosterone), cortisol,

neurotransmitters (i.e., dopamine, serotonin, norepinephrine) and monoamine oxidase (MAO). Research has found that males who scored higher on the Sensation Seeking Scales-V (SSS-V, Zuckerman, 1994) had higher levels of testosterone (Aluja & Torrubia, 2004; Daitzman & Zuckerman, 1980; Gerra et al., 1999; Rosenblitt, Soler, Johnson, & Quadagno, 2001). In the Daitzman and Zuckerman (1980) study, men who had high scores on the disinhibition scale of the SSS-V had unusually high levels of testosterone compared to males who had low scores on the disinhibition scale. The testosterone levels of the low disinhibitors were very close to levels of normal men in the same age group.

Cortisol, a stress hormone, has been found to be negatively related to sensation seeking (Rosenblitt, Soler, Johnson, & Quadagno, 2001). Under stress, high sensation seekers have a lower level of cortisol than low sensation seekers. The theory is that feeling lower levels of arousal from cortisol, the sensation seekers do not experience inhibitory controls as do low sensation seekers whose cortisol levels are high. The high sensation seekers continue to seek novelty under stressful conditions that could inhibit low sensation seekers (Zuckerman & Kuhlman, 2000).

Research has linked low levels of the enzyme monoamine oxidase (MAO) to tobacco, alcohol, drug use, criminal offenses, sensation seeking, sociability, disinhibition, and impulsivity (Zuckerman & Kuhlman, 2000). Monoamine oxidase (MAO) is involved in the degradation and storage of the monoamine neurotransmitters dopamine, serotonin, and norepinephrine in the presynaptic vesicles, thereby regulating the levels of these neurotransmitters. For example, monamine oxidase regulates dopamine and the sensitivity of the dopamine receptors that are associated with high sensation seeking (Zuckerman, 2007). Low levels of MAO result in more available dopamine and greater sensitivity of the receptors. MAO increases with age and is higher in women than in men at all ages (Zuckerman).

Cloninger (1987b) presented a neurobiological learning model for the etiology of alcoholism comprised of the interaction among personality traits, underlying brain structures and processes, and environmental background. Novelty seeking, a heritable trait, manifests in exploratory activity and a highly reactive response to novel stimuli. In response to boredom, novelty seekers actively seek avoidance and escape by using alcohol. Alcohol blocks the behavioral inhibitions that novelty seekers have learned through operant conditioning. Alcohol, a dopamine agonist, increases dopamine transmission and novelty seeking. Novelty seekers may experience increases in dopamine and novelty seeking as a reward, thereby reinforcing alcohol seeking behavior in novelty seekers.

Sensation seeking and genetic links. Zuckerman (1994) posited a genetic link to sensation seeking, involving gonadal hormones, the stress hormone, cortisol, neurotransmitter systems, and monoamine oxidase. Ebstein et al. (1996) used Cloninger's (1987a) Tridimensional Personality Questionnaire (TPQ) to investigate the association between "novelty seeking" trait and the existence of either allele 4 or allele 7 in the D4 dopamine receptor (D4DR) exon 111. The participants were 124 Israeli students and staff at Ben-Gurion University. The results revealed a significant positive association between novelty seeking and the presence of allele 7. Gender differences were not significant. Additional studies have found an association between the personality trait, "novelty seeking" and the gene, D4 dopamine receptor (D4DR) exon 111 (Ekelund, Lichterman, Jarvelin, & Peltonin, 1999; Keltikangas-Jarvinen, Elovainio, Kivimaki, Lichtermann, & Peltonen,2003).

Hur and Bouchard (1997) investigated genetic contributions to the correlations between impulsivity and sensation seeking using a sample of 53 monozygotic and 47 dizygotic twin pairs. The twin dyads were reared apart. "The twin correlation is a correlation within a twin pair for a single subscale (e.g., Twin 1's TAS score with Twin 2's TAS score)" (p. 459). The twin

correlations for the monozygotic twins on the Sensation Seeking Scale-V subscales (Zuckerman, 1994); disinhibition (DIS), thrill and adventure seeking (TAS), experience seeking (ES), and boredom were moderately high. Compared to the dizygotic twins, the monozygotic twin correlations were higher on all subscales of the SSS-V (Zuckerman, 1994), except the Thrill and Adventure Seeking (TAS).The findings supported genetic influence on sensation seeking traits. When male and female participants were compared, males scored significantly higher on three subscales of the SSS-V (DIS, TAS, and BS) than females.

Stoel, DeGeus, & Boomsma (2006) conducted a genetic analysis of sensation seeking using an extended twin design, with 9,220 monozygotic and dizygotic twins, with an average age of 25.3 years. They found that the correlations between scores on sensations seeking for monozygotic twins were approximately double that of dizygotic twins. Multiple linear regression statistical procedures were used to determine the amount of variance in sensation seeking (predictor variable) that was accounted for by subscales on the SSS-IV (Dutch translation; Feij & Zuilen as cited in Stoel et al., 2006) and common familial environmental factors (i.e., parental family environment, religion, parental SES, and parental rearing style). These findings suggested that greater individual variation on the sensation seeking trait may be genetic. The genetic role in the thrill and adventure seeking (TAS) subscale accounted for 34% of the variance in sensation seeking for males and 62% for females. Common environmental influences accounted for 21% of the variance for males. Genetic traits associated with the experience seeking (ES) subscale accounted for 60% for males and 42% for females of the variance in sensation seeking, with 13% of the female variance accounted for by common environmental influences. The amount of explained variation for the boredom susceptibility (BS) subscale genetic influence was 48% for males and 29% for females, with common environmental effects accounting for 18% of the variance in females. The authors asserted that although genetic factors make a greater

contribution to the sensation seeking trait, common environmental factors also influence this trait.

Sensation seeking and maturation. Steinberg (2004, 2008) hypothesized a dual systems model of sensation seeking comprised of two brain networks, the socioemotional system and the cognitive control system. These brain networks continue to develop during adolescence and into emerging adulthood. The socioemotional system develops early and suddenly, increasing reward sensitivity and reward seeking, regulating emotional arousal and susceptibility to peer influence, and processing social information and reward sensitivity (Steinberg, 2008). The cognitive control system processes self-regulatory and executive functions (e.g., response inhibition, gratification delay, planning, and future planning; Steinberg, 2004). The cognitive control system develops slowly during adolescence and is not fully developed until the mid-20s. The developmental trajectories of these two systems set the stage for an escalation in sensation seeking due to an increased sensitivity to reward, need for reward, and decreased ability in cognitive functioning (Steinberg).

Studies consistently have found that logical reasoning skills are essentially developed by approximately 15 years of age and that adolescent reasoning skills are similar to adults in their perception and assessment of risk and evaluation of consequences (Millstein & Halper-Felsher, 2002; Reyna & Farley, 2006). In the absence of emotional arousal, the cognitive control system is able to inhibit risky behavior. Nonetheless, during times of heightened emotional arousal, the socioemotional system activates and the cognitive control system is not strong enough to provide behavioral controls, resulting in decisions and behavior highly influenced by reward seeking and social and emotional influences (Zuckerman, 2007).

In a study of the contribution of the sensation seeking trait to the basic development of reckless behavior in adolescence using the Arnett Inventory of Sensation Seeking (AISS, Arnett,

1994b), Arnett (1996) investigated 133 adolescents, 17 to 18 years of age, attending a high school in a medium sized suburban city, and 346 college students, 18 to 23 years of age enrolled at a large Midwestern university. In the high school sample, sensation seeking was significantly and positively related to 'sex with someone not known well' and significantly related to use of illegal drugs other than marijuana. The sensation seeking composite score was higher for males than females. However, no gender differences were found for sexual behavior or drug use. In the college sample, sensation seeking was significantly and positively related to substance use, alcohol intoxication, marijuana use, other illegal drug use, sex without contraception, sex with someone not well known, and number of sexual partners. Arnett (1996) found that within the college sample, males had statistically significantly higher levels of sensation seeking than females.

A comparison of the high school students to the college students provided no evidence of significant difference in levels of sensation seeking (Arnett, 1996). The prevalence of risk taking behavior was substantially higher in college students for sex without contraception, sex with someone not well known, and marijuana use compared to the high school sample (Arnett, 1996). According to Arnett, risk taking behavior increases though the late teens and early 20s and for most individuals does not decline until the mid-20s and late 20s.

Arnett (1998) studied sensation seeking, risk behavior, and role transitions in a population of 140 emerging adults, 21 to 28 years of age. The sample included 84 (60%) single adults and 56 (40%) married adults. Sensation seeking was positively related to substance use and risky sexual behavior. Almost two thirds (65%) of the sample reported binge drinking (five or more drinks in a row) and 40% reported using marijuana at least once in the past year. Compared to prior research, Arnett (1998) indicated a lower percentage (10%) reported illicit drug use other than marijuana. Approximately 25% of the single participants (n = 84) reported

having sex without protection, with someone not well known, and with more than one sexual partner at least once in the past year. Women, when compared to men, had lower scores for sensation seeking and reported lower rates of binge drinking.

Adolescents and emerging adults under 25 years of age are more likely to engage in binge drinking and have casual sex partners than individuals over 25 years of age Zuckerman, 2008). Hovarth and Zuckerman (1993) in a study of sensation seeking, risk appraisal, and risk taking behavior (i.e., substance abuse and sexual risk) in a sample of 447 undergraduate students at the University of Delaware found that the total score on the SSS-V (Zuckerman, Eysenck, & Eysenck, 1978) was negatively and significantly related to individuals' own risk appraisal. High sensation seekers tended to appraise risk of an activity as less risky than low sensation seekers. High sensation seekers are positively reinforced after engaging in a risky activity without aversive consequences. Low sensation seekers who avoid risk taking activities are positively reinforced for their avoidance when they experience positive consequences. A negative correlation was found between risk appraisal and risk behavior with low risk appraisers being more likely than high risk appraisers to engage in risk taking behavior. The correlation between risky sexual behaviors and sensation seeking was statistically significant for males, but not for females.

In a study of 935 individuals 10 to 30 years of age, Steinberg, Albert, Cauffman, Banich, Graham, & Woolard, (2008) found that sensation seeking was related to pubertal status, with significant relations found for pubertal status on self-reported sensation seeking for males but not for females. Sensation seeking scores for post pubertal males was near the maximum score.

In a study of sensation seeking, personal fable, and risky behaviors, alcohol consumption, drug use, and risky sexual behavior, Greene et al. (2000) sampled 381 students from 11 to 18 years of age and a sample of 343 college students from 18 to 25 years of age. For risky sexual

behaviors, illicit drug use, and alcohol consumption, a statistically significant interaction effect was found between sensation seeking and personal fable. Participants high in both sensation seeking and personal fable had high levels of risky sexual behavior, drug use, and alcohol consumption. Participants low in personal fable and high in sensation seeking had moderate levels of the three risk behaviors. In this study, males scored significantly higher than females on sensation seeking and risk taking behavior.

Horvath, Milich, Lynam, Leukefeld, and, Clayton,. (2004) investigated sensation seeking and substance use (alcohol, tobacco, marijuana) in ninth and tenth grade students and their relation to sensation seeking and substance use at 19 to 21 years of age. The researchers found that higher levels of sensation seeking in ninth and tenth grade students were significantly correlated with higher levels of substance use at 19 to 21 years of age. An interesting finding was the possible interaction between substance use and sensation seeking. Higher levels of substance use in ninth and tenth grade students was associated with higher levels of sensation seeking at 19 to 21 years of age, suggesting that substance use may be associated with later personality development.

Sensation seeking and risk taking. At a university in a small town in the eastern United States, Zuckerman and Kuhlman (2000) investigated the relation between impulsive sensation seeking measured by the Impulsive Sensation Seeking Scale (ImpSS) from the Zuckerman-Kuhlman Personality Questionnaire (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) and risk taking behavior measured by the Life Experiences Questionnaire (LEQ; Zuckerman & Kuhlman, 2000). A sample of 260 undergraduate students who were 18 to 19 years of age and enrolled in introductory psychology courses were asked to complete the two questionnaires. Impulsive sensation seeking was a statistically significant predictor of three risk taking

behaviors: drinking behavior, drug risk behavior, and sexual risk. Men scored higher than women on the total score of the ZKPQ (Zuckerman et al., 1993).

In a study of the frequency of binge drinking and other factors related to sensation seeking, Carlson, Johnson, and Jacobs (2010) used a sample of 302 undergraduate students at least 19 years of age (legal drinking age) at a Western Canadian university. Binge drinking was defined as five or more drinks containing alcohol for men and four or more drinks for women in a 2-hour period. The researchers found that scores on the thrill and adventure seeking scale (TAS) of the SSS-V (Zuckerman, 1994) were significantly, positively correlated with binge drinking frequency for men. For women, both the TAS and the boredom susceptibility scale (BS) of the SSS-V were significantly, positively correlated to binge drinking frequency. The TAS scale and the BS scale significantly predicted binge drinking frequency.

In a study of sensation seeking and risk taking in a sample of 879 heterosexual men from 18 to 81 years of age (M= 25.2 years), Bancroft et al. (2004) used the total score of the Sensation Seeking Scale-V (SSS-V, Zuckerman, 1994) and the subscale scores, disinhibition and boredom susceptibility scales. The findings revealed that disinhibition subscale scores were significant predictors of the number of sexual partners in the past two months. The number of partners in the past year was significantly related to the number of alcoholic drinks per week and was significantly higher in participants who reported recreational drug use.

Wagner (2001) studied sensation seeking, substance abuse, and risk taking behavior in 155 undergraduate students. He found that sensation seeking had a positive significant association with risky sexual behavior and was a significant predictor of substance abuse.

A longitudinal research design was used to examine sensation seeking and risk behavior using a sample of 2,949 high school students. Donohew et al. (2000) found that sensation

seeking was significantly associated in a positive direction with the use of alcohol before sex in the past year and to having ever used marijuana before sex in the past year.

Using a sample of 442 college students from 18 to 25 years of age, Justus, Finn, and Steinmetz (2000) studied the personality trait, sensation seeking, and its association with alcohol use and risky sexual behavior. Using the SSS-V (Zuckerman, 1994) subscales, disinhibition and boredom susceptibility, sensation seeking was significantly related to alcohol use and risky sexual behavior. While the association between alcohol use and sexual risk behavior has been well established, Justus et al. (2000) found that when sensation seeking was controlled for in analyses, alcohol was no longer significantly related to risky sexual behavior. This finding suggested that sexual risk behavior and increased alcohol use may have resulted from the personality trait that increases the likelihood of these behaviors.

Simons, Gaher, Correia, and Bush (2005) conducted a study of sensation seeking, marijuana use, and club drug use (e.g., amphetamines, speed, crystal meth, ecstasy [MDMA], Special K [Ketamine]) using a sample of 831college students at two state universities. Marijuana use and sensation seeking significantly predicted club drug use. Simons, Gaher, Correia, and Bush (2005) found that marijuana use was positively correlated with the initiation of club drug use. In examining gender differences for the study, men were less likely to have tried club drugs than women.

Yanovitsky (2006) investigated sensation seeking, peer influence, and alcohol use in 427 undergraduates at a large public northeastern university. Baron and Kenny's (2012) mediation analysis was used to determine if peer influence was mediating the relation between sensation seeking and personal alcohol use. The results of this analysis provided support for the mediational hypothesis. The amount of variance explained by sensation seeking in alcohol use was significantly reduced by peer influence.

Rolison and Scherman (2003) investigated risk taking behavior (unprotected sex, drinking and driving) in 196 college students from 18 to 21 years of age. Perceived peer participation explained the greatest amount of variance in involvement in risk taking behavior (Rolison & Sherman). Scores on the disinhibition subscale of the SSS-V (Zuckerman, 1994) and scores for perceived benefits also were statistically significant predictors of risk taking behavior. Males scored significantly higher than females on risk taking frequency, disinhibition, boredom susceptibility, perceived benefits, number of likely positive consequences, and perceived peer participation. Significantly lower perceived levels of the likelihood of negative consequences were associated with males.

Horvath and Zuckerman (1993) studied the relation between sensation seeking and risk appraisal of sexual activities for contracting AIDS among other variables. Participants were 447 students in introductory psychology courses. In accord with prior research, results indicated a significant, negative correlation between high scores on the Sensation Seeking Scale-V (SSS-V, Zuckerman et al., 1978) and estimates of risk. A surprising finding for both males and females was a positive association between high scores on the SSS-V and appraisal of risk for contracting AIDS. However, the correlation was significant only for women. Sensation seeking scores were positively correlated with risky sexual behavior only in males (Horvath & Zuckerman).

The results of a meta-analysis of 150 studies that compared risk taking between males and females supported the notion that males were more likely than females to engage in risk taking behavior (Byrnes, Miller, & Schafer, 1999). Zuckerman (2007) stated that gender and ethnicity related differentially to risk. Sensation seeking was found to be higher in men than in women and higher in Caucasians than in ethnic groups (Zuckerman, 1994). Women estimated risk higher than men. Compared to Caucasians, ethnic groups' appraised risk was higher for many activities, including alcohol and other drug use (Zuckerman, 1994).

Sensation seeking and environmental-biological interaction effects. Both biological processes and environmental effects contribute to sensation seeking in adolescents and emerging adults (Steinberg, 2008). The brain matures "within an environmental context that influences the course of neural development and moderates its expression in emotion, behavior, and cognition" (Steinberg, 2009, p. 160).

In a review of the psychobiology of novelty seeking and drug seeking behavior, Bardo, Donohew, and Harrington (1996) discussed the interaction between genetic processes and environmental contexts. Individual differences in novelty seeking and drug seeking behavior may result from inherited differences in brain systems for example, the sensitivity of the mesolimbic dopaminergic reward system. Environmental contexts and experiences (i.e., social interactions and experiences with novel objects) during development may partially influence novelty seeking and drug seeking behavior. Animal studies have found that an enriched environment (experience with novel objects) compared to an impoverished environment may result in hypersensitivity of the mesolimbic dopaminergic reward system to amphetamines and have an effect on other neural changes (Bardo et al.).

Sensation seeking is considered a genetically influenced personality trait related to variations in biochemical processes and concurrently influenced by environmental and developmental factors. Compared to low sensation seekers, high sensation seekers generally engage more frequently in risk taking behavior, have a greater tolerance for risk, are more sensitive to reward derived from the activities, and make a lower appraisal of risk involved in the activities. College students' high scores on sensation seeking measures have been associated with alcohol, marijuana, and other drug use and risky sexual behaviors. Overall, men have scored higher than women on assessments of sensation seeking and risk taking behavior (e.g., substance

use and sexual behavior). Ethnic groups tend to score lower in sensation seeking and make higher assessments of risk in alcohol and other drug use than Caucasians.

Peer Influence

According to Bronfenbrenner's ecological theory of development, human beings develop throughout their life span in changing proximal and distal environmental contexts that interact with their continuing development so that each process mutually affects the other (Bronfenbrenner, 1977). Bronfenbrenner conceived of each environmental system to be nested successively within the next one.

The microsystem is defined as a setting that consists of developing individuals', home, family, neighborhood, school, peers, place of worship, camp, and possibly work place and the multiple interactions among developing individuals and these immediate contexts. Within the physical characteristics of each context, individuals participate in particular activities and function in particular roles (i.e., son, sister, student, friend, member of a place of worship etc.) during a particular time period.

The mesosystem consists of the interactions among the contexts of the microsystem in which individuals are developing during a specific period of time in their lives. The exosystem contains other social structures (e.g., societal institutions; local, state, and national governmental agencies; communication and transportation systems; forms of media; parental work settings and conditions). Although individuals are not included in most of the social structures of the exosystem, they can be affected by them (e.g., parents' jobs affecting the family indirectly). These social structures consist of the systems in the microsystem or they infringe, in some way, on the environments of the microsystem and thus, they can influence or control the activities within these immediate settings.

The fourth environmental system is the macrosystem, consisting of very broad institutions (e.g., social and economic environments, political and legal systems, educational systems) that provide the historical background of one's life. Macrosystems disseminate information and generate thoughts, ideas, beliefs, and principles that give meaning to particular organizations and their interactions (Bronfenbrenner, 1977).

Bronfenbrenner's (1999) work to develop a theoretical model has evolved into a bioecological model that contains the concepts of environment, proximal processes, and the characteristics of developing individuals. According to Bronfenbrenner, development occurs when individuals engage in activities repeatedly overtime. The activities are a stable part of the environment and include interaction between involved, biopsychological individuals and the people, symbols, and objects in the proximal environment. During development, these active interactions become more and more complex, enhancing developmental abilities. These stable forms of interaction that occur in the immediate environment quite regularly over long periods of time are referred to as *proximal processes* (e.g., "parent-child and child-child activities, group or solitary play, reading, learning new skills, studying, athletic activities, and performing complex tasks," Bronfenbrenner, 1995, p. 620).

Proximal processes take place during the interactions of the individuals' characteristics (i.e., temperament, personality traits) with the proximal and distal environments. In bioecological theory, personal characteristics generate individuals' development and they result from individuals' development (Bronfenbrenner, 1999). Individuals may experience proximal and distal peer influence in any of the environmental systems.

Social learning theory asserts that peer socialization effects occur through modeled behavior and imitation of peers who are important (Bandura, 1986). Individuals seek to be like

their peers to gain the social reward of their peers' acceptance and positive regard that in turn reinforces their imitating behavior.

In a review of 14 multivariate theories of experimental substance use, Petraitis, Flay, and Miller (1995) reported that social learning theory posits that in the case of adolescent early substance use adolescents adopt the beliefs of their role models (e.g., close friends and parents who use substances). Two substance-specific beliefs are formed by modeling of parental and friend experimenting with substances, self-efficacy belief to engage in substance use, and the belief in receiving benefits from substance abuse. In observing friends purchase and use alcohol, marijuana, or other drugs; the observers can learn the skills to obtain and use these substances, increasing their self-efficacy to perform these behaviors (Petraitis et al., 1995).

According to social learning theory, adolescents most likely learn from merely hearing important role models talk about the benefits of substance use. Antisocial and health risk taking behaviors have been found to be reinforced when peers talk among themselves about these behaviors and when the talk is accompanied by positive affective responses (i.e., smiling, laughing; Brechwald & Prinstein, 2011). Positive affective responses to deviant talk have been associated with increases in substance use and violent behavior (Dishion et al., 1996). Social learning theory posits that substance-specific attitudes and behaviors of prominent, important role models are a crucial cause of substance-specific beliefs. According to social learning theory, substance-specific beliefs are the major contributor to early substance use in adolescents (Petraitis et al., 1995).

Steinberg (2009) asserted that numerous biological changes occur during adolescent brain development, including changes in the ratio of gray and white brain matter, increases in dopaminergic activity, and enhanced connectivity among brain regions. These biological

processes occur in the context of the environment that influences neural development, as well as the manifestation of emotions, behaviors, and cognitions.

Gardner and Steinberg (2005) studied the effect of peer influence during a simulated driving task ("chicken") on 306 participants in three age groups: adolescents (13 to 16 years), late adolescents (18 to 22 years), and adults (24 years and older). Results indicated that during the driving task the adolescent group took twice as many risks when in the presence of their peers than when alone. The oldest group demonstrated no differences in risk taking in either context. The late adolescent group showed an intermediate effect. Their risky behavior increased by 50% in the presence of peers. No significant differences were noted between male and female participants on risk taking. The results suggested that developmental processes involved in the ability to resist peer influence may continue throughout late adolescence and into early adulthood and that research and interventions are needed for this age group.

Social norm theory, an environmental model, is based on the notion that adolescents' and emerging adults' behavior is often influenced by their perceptions of the social norm. Perceived norms are ratings based on perceptions of the extent to which various behaviors are acceptable and typical, (e.g., alcohol and other drug use norms, and sexual behavior norms among their peers; Baer, 2002). Social norm theory posits that adolescents and emerging adults are inclined to estimate that their peers' behavior exceeds their own. These misperceptions escalate the likelihood that they will increase their own behavior to match the level of the perceived social norm (Scholly, Katz, Gascoigne, & Holck, 2005). Adolescents and emerging adults have been found to consistently estimate that the amount and frequency of acceptable behavior is higher than their own behavior and higher than the actual norm (Perkins, Meilman, Leichliter, Cashin, & Presley, 1999; Perkins, Haines, & Rice, 2005). Perceptions of the social norm have been significantly correlated with students' drinking behavior (Perkins & Wechsler, 1996; Hartzler &

Fromme, 2003; Perkins, 2003), drug use (Martens,Page, Mowry, Damann, Taylor, & Crimini, 2006), and risky sexual activity (Baer & Carney, 1993; Baer, Stacy, & Larimer, 1991; Rolinson & Sherman 2003).

Baer (2002) reviewed studies of individual variations in college student drinking related to the perceived drinking norm for acceptable behavior. In general, findings indicated that student perceptions of drinking rates among their peers were higher than self-reported rates of their own drinking behavior and higher than actual rates when assessed independently. Borsai and Carey (2003) used a meta-analysis of 23 studies to examine predictors of discrepancies between college students' behaviors and their perceptions of others' behaviors in regard to alcohol use. They found that perceptions of behavior norms were significantly related to differences between self-reported behavior and perceptions of others' behavior. Student participants perceived that others drank more than they did as indicated from self-reports. Women, more than men, reported greater discrepancies between their own alcohol use and others' use, perceiving that others' use was higher than indicated in their self-reports (Borsai & Carey).

Perkins and Wechsler (1996) investigated the relation between the perception of a permissive college norm for alcohol use and binge drinking (5 or more drinks in a row for males and 4 drinks for females). They surveyed 17,592 undergraduate students from 140 colleges and universities in 40 states. Participants' ages ranged from 45% percent under 21years of age, 38% from 21 to 23, and 17% over 24 years of age. Students' perceptions of a permissive campus norm for amount of alcohol consumption was significantly related in a positive direction to the amount of binge drinking and remained a significant predictor of personal alcohol abuse in environments regardless of actual peer drinking levels.

Perkins (2002b) reviewed empirical research on the role of perceptions for alcohol and other drug norms and student substance use. Perkins found that overestimation of a permissive environment for alcohol and other drug abuse among peers was significantly correlated with students' self-reported personal use (Clapp & McDonald, 2000), similar to results in other studies. Perkins, Haines, and Rice (2005) did a nationwide study of perceived norms and exposure to prevention information and alcohol misuse. They used data from the National College Health Assessment (NCHA) from 2000 to 2003 that surveyed 76,145 students from 130 colleges and universities. They found that students at approximately 75% of colleges nationwide overestimated the amount of alcohol their peers consumed at social events, regardless of the level of the actual campus drinking norm (low, medium, or high). The perceived drinking norm was the strongest significant predictor of the amount of alcohol consumption compared to all demographic variables. Male gender was a strong predictor of personal drinking, second to perceived norm.

Hartzler and Fromme (2003) studied self-reported drinking and perceived peer drinking in high school and at college entrance, using a sample of 520 college freshmen enrolled in the University of Texas during the fall semester. Results revealed that at college entrance, perceived increases in peer drinking were positively associated with self-reported increases in drinking. Both men and women overestimated their peers' drinking behavior, with women's perceptions of peer drinking greater than men's perceptions. The frequency of binge drinking for both men and women was significantly related in a positive direction to perceptions of the peers' binge drinking.

In a nationwide study of 4,960 undergraduate college students from 16 colleges and universities of various sizes, Reis and Riley (2000) investigated the association between perceived peer weekly alcohol consumption and self-reported weekly alcohol use. The

researchers found that male participants' gender-specific norm perceptions of other men's weekly alcohol consumption was a statistically significant predictor of self-reported weekly alcohol use, in the positive direction. The same was true for female participants' gender-specific perception of other women's weekly alcohol consumption.

Neighbors, Lee, Lewis, Fossos, and Larimer (2007) investigated the effects of social norms on the drinking behavior of 818 heavy-drinking freshmen college students at a large west-coast university. The participants ranged in age from 17 to 21 years and met the inclusion criteria for heavy drinking, four or more drinks on one occasion for women and five or more drinks for men. Social norms for drinking were found to be the best predictor for typical weekly alcohol consumption (Neighbors et al., 2007).

Perkins and Craig (2006) conducted a study using a prevention intervention focusing on changing student athletes' perceptions of social norms on alcohol consumption on campus. The purpose of the study was to reduce alcohol abuse among college athletes at an undergraduate college. During the three years of the study from 2001 to 2003, approximately 400 student-athletes completed the surveys each year of the study. The researchers found that after receiving the social norm information regarding the actual amounts of peer frequency and weekly alcohol consumption, misperceptions of the frequency of weekly alcohol consumption by student-athlete peers decreased by nearly a half. In addition, the perceived quantities of alcohol consumed decreased by a third. Compared to new student-athletes who were given little instruction, the student-athletes who received instruction for at least one year reported at least a 30% reduction in their own frequency, quantity of alcohol use, and number of alcohol-related problems during the three years of the study. The drinking norm information did not filter down to new student-athletes who received little intervention exposure. They reported no significant changes in norm perceptions.

For five years at a public university residential campus, Haines and Spear (1996) implemented a campus-wide media campaign to dispel misperceptions of the binge drinking college norm. After implementation of the intervention, the percentage (69.7%) of students who perceived binge drinking as the college norm decreased to 51.2%. The percentage (43.0%) of students who self-reported binge drinking also decreased significantly to 34.2%. The findings suggested that a media campaign to inform students of their peers' actual incidents of binge drinking may be useful in decreasing perceptions of drinking norms and their personal binge drinking behavior.

Research studies have consistently reported an association between perception of peer norms and individual alcohol use, with higher perceived norms related to greater alcohol use. Research has focused less attention on the associations between perceived norms for marijuana use and other drug use (Martens et al., 2006). In a study of perceptions of marijuana use at three northwestern college campuses, researchers surveyed 5,990 students with an average age of 21.2 years (Kilmer et al., 2006). The students' perceived norm frequency for marijuana use of friends and students in general accounted for 30% of the variance in the frequency of the participants' own frequency of marijuana use. The findings support the idea that students' perceptions of what their peers and other students on campus are doing can affect their decision to use marijuana or other drugs.

During the summer before college entrance to a large public university, a sample of 351 high school graduates, 17 to 19 years of age, was surveyed regarding their perceived norm for marijuana use among friends and their own marijuana use (Neighbors, Geisner, & Lee, 2008). Results revealed a positive association between perceived norms and personal use. No gender differences in perceived norms were reported, however, men reported higher frequencies of marijuana use than women.

Research also has explored the relation between perceived sexual norms and actual involvement in risky sexual behavior. In a study of 410 college students, Bon, Hittner, and Lawandales (2001) investigated relations between participants' behavior and perceptions of their peers' behavior regarding alcohol and marijuana use and risky sexual behavior (i.e., sex without a condom, oral sex, sexual intercourse with someone they just met). The three conditions for risky sexual behavior were treated as separate criterion variables in the hierarchical multiple linear regression analyses. Normative perceptions of risky sexual behavior and the number of recent sex partners were the strongest predictors of risky sexual behavior both when the participants were drunk or high and when they were not drunk or high. The two predictor variables, perception of risky sexual behavior norms and number of recent sex partners, explained a greater amount of the variance in the three types of risky sexual behaviors in the intoxicated state (ranging from 23% to 33%) than in the sober condition (ranging from 18% to 19%). The findings revealed that participants perceived that their peers engaged significantly more frequently in risky sexual behavior than they did.

Page, Hammermeister, and Scanlan (2000) investigated students' perceptions of the sexual activity norm and self-reported sexual activity in the past month at a northwestern public university. The study included 725 students in introductory English classes with a mean age of 19.7 years of age. Compared to students who were not sexually active in the month prior to the study, students who had intercourse in the prior month made higher estimates of recent sexual activity for their campus peers. The impression that "everyone is doing it" may have influenced students' responses. Nearly one quarter of males and females estimated that 75% of their peers had been sexually active in the month prior to the study. Males who estimated that 75% or more of their male peers were sexually active were 11 times more likely to have had sexual intercourse compared to male students who estimated that less than 25% of their male peers had had sexual

intercourse. Females who had high estimates (75% or more) of their female peers engaging in sexual intercourse in the past month were four times more likely to have had the same experiences (Page et al., 2000).

Rolinson and Sherman (2003) investigated a sample of 196 college students from 18 to 21 years of age at a large, southwestern university regarding risk taking from the perspectives of personality trait (sensation seeking), environment (perceived peer participation), and cognition (decision making). Results revealed that perceived peer participation was a significant predictor of personal engagement in unprotected sexual intercourse, as well as drinking and driving.

Scholly, Katz, Gascoigne, and Holck (2005) studied undergraduate students on three public and three private college campuses in five different states. Consistent with the social norms approach, findings revealed that students overestimated their peers' participation in risky sexual behaviors, including frequency of sexual intercourse with a greater number of sexual partners, incidence of sexually transmitted infections, and number of unintended pregnancies. In addition, the students underestimated their peers' use of condoms. A majority of sexually active students reported condom use, but only about 35% of sexually active students reported consistent (every time) condom use for vaginal intercourse. In this study, a 9-month intervention of information to correct misperceptions of normative sexual activity resulted in no change in norm perceptions or personal behavior.

Martens et al. (2006) collected data from 833 undergraduate students with a median age of 21 years at a large public university in the northeastern United States. The majority of students overestimated the perceived peer norm for alcohol and other drug use (i.e., marijuana, cocaine, amphetamines) and sexual behavior (i.e., oral sex, vaginal and anal intercourse, number of sexual partners). A statistically significant, positive relationship was found between perceived norm

behaviors and students' self-reported behaviors in all three areas; however, effect sizes were small to moderate.

Results of the studies on peer influence and risk taking behaviors supported the perspective that the environment can influence risk taking behavior. Through observation and modeling of favored, admired peers, participants were more likely to identify behaviors that their peers considered permissible, acceptable, and desirable. Participants tended to engage in behaviors approved by the peer group to receive the reward of peer sanction, acceptance, and status of belonging to the group. Individuals consistently misperceived and overestimated the frequency and extent of their peers' behaviors. Overestimation of peers' behaviors has been positively associated with individuals' behaviors regardless of their peers' actual behavior or the actual social norm. Increase in individuals' behavior may reflect an attempt to attain the perceived level of their peer group's behavior.

General Resistance to Peer Influence

Research since the 1980s consistently has found noteworthy similarities in behavior and attitudes among adolescents and their friends (Brechwald & Prinstein, 2011). During the transition from high school to college, individuals form new peer groups in the college setting that may increase their need to conform and pressure from others to conform in an effort to achieve acceptance and belongingness in a new peer group (Brechwald & Prinstein). Hartzler and Fromme (2003) found that at college entrance, students' self-reported increases in drinking compared to high school levels were positively associated with perceived increases in peers' drinking.

Two theories posit an explanation for the similarities among peers (Brechwald & Prinstein, 2011). Selection effects theory suggests that adolescents are attracted to individuals whose behavior and attitudes most closely match their own. Socialization effects theory holds

that adolescents' behavior and attitudes become more like their peers overtime (Brechwald & Prinstein).

Social learning theory suggests that individuals emulate the behaviors of salient peer models through observation. They emulate their peers to receive the extrinsic social reward of status similar to their peers, which in turn, reinforces their imitative behavior (Bandura, 1986). By imitating perceived social norm behavior of salient peers, individuals also receive an intrinsic reward, a more positive sense of self (Festinger, 1954). Bronfenbrenner's ecological theory hypothesizes that individuals' environments influence their development (1977).

General resistance to peer influence was examined by Steinberg and Monahan (2007) who developed a measure of general perceived resistance to peer influence, the Resistance to Peer Influence (RPI) scale. According to the researchers, the items of the RPI measure susceptibility to peer influence in a general way. Instead of presenting hypothetical scenarios of specific behaviors, as is typical in most of these types of instruments, the RPI presents a choice between two desirable behaviors. For example, "Some people think it is more important to be an individual than to fit in with the crowd . . . but . . . Other people think it is more important to fit in with the crowd than to stand out as an individual." The respondent chooses which of the two behaviors is most like him/her?

Maturation/developmental effects. In an ethnically, socioeconomically diverse sample of 3,600 males and females 10 to 30 years of age, Steinberg and Monahan (2007) examined the relation between age and resistance to peer influence, using the RPI (Steinberg & Monahan, 2007). The study results indicated a linear growth pattern of resistance to peer influence that was more likely to occur between 14 and 18 years of age than before or after. The results of this study raised the question of the length of the maturation process for resistance to peer influence. Their findings were consistent with other studies of resistance to peer influence (Paus et al., 2008;

Sumter, Bokhorst, Steinberg & Westenberg, 2009). Gender differences indicated that females were more resistant to peer influence than were males during and after adolescence. The researchers suggested that the increase in susceptibility to peer influence during adolescence may result from an increase in peer demands for conformity rather than a decrease in resistance to peer influence (Steinberg & Monahan, 2007). If increased peer pressure to conform is related to increases in susceptibility to peer influence, increased peer influence at college entrance may explain college students' self-reports of increased drinking (Hartzler & Fromme, 2003).

Sumter, Bokhorst, Steinberg, and Westenberg (2009) investigated the relation between susceptibility to peer influence and age. The researchers assessed susceptibility to peer influence with the RPI (Steinberg & Monahan, 2007) using a sample of 464 adolescents, 10 to 18 years of age. The adolescents were divided into 3 groups; 10 to 12, 13 to 15, and 16 to 18 years of age. Findings indicated a linear effect for increased general resistance to peer influence with age. Significant differential effects were found between the three groups. During middle adolescence (the group 13 to 15 years of age), females were significantly more resistant to peer influence than males. By late adolescence, females and males reported no difference in resistance to peer influence.

Neurobiological processes. Grosbras et al. (2007) found neural structures and systems that were related to heightened sensitivity to peer influence. In response to observations of neutral and angry hand and face movements, 46 children (9 to 10 years of age) had differential activity in brain regions that correlated with scores on the RPI (Steinberg & Monahan, 2007). Compared to children with low RPI scores, children with higher resistance to peer influence showed higher functional activity in the right dorsal premotor cortex and left mid-dorsal prefrontal cortex and higher functional connectivity in the cortical networks when watching angry hand movements.

Paus et al. (2008) investigated the relation between cortical thickness of 22 cortical regions and three cortical networks and resistance to peer influence. The participants (n = 295) were adolescents from 12 to 18 years of age in Quebec, Canada. Cortical thickness decreases with age. Results indicated that high scores on the RPI were associated with lower cortical thickness and higher morphological similarity in the three cortical networks. The researchers compared the cortical thickness of males with high and low RPI scores. They found a negative association between cortical thickness and RPI scores. The findings may be due to greater maturity of the cortex in males with high RPI scores and a less mature cortex in males with low RPI scores. Females showed higher resistance to peer influence than males. RPI scores increased with age, but the increase was significant only for females

Moor, vanLeijenhorst, Rombouts, Crone, & VanderMolen (2010) studied the relation between activity in two brain regions and participants' responses to social rejection. The researchers administered the Dutch version of the RPI, (Steinberg & Monahan, 2007) to four groups of 57 pre-pubertal adolescents (8 to 10 years of age), early adolescents (12 to 14 years of age), late adolescents (16 to 17 years of age), and young adults (19 to 25 years of age). Results showed significant positive correlations between activity in the left putamen and the left prefrontal cortex and the participants' judgment of rejection across age groups. Compared to participants with lower RPI scores, individuals' with higher RPI scores showed significantly greater activation in these two brain regions in response to social rejection. Even when controlling for age-related increases in scores on the RPI, the correlations remained significant.

Biological interactions with the environment. Chien, Albert, O'Brien, Uckert, and Steinberg (2010) investigated the presence of peers in promoting adolescent risk taking. They found that greater activation of the socioemotional system, which is comprised of two brain regions (i.e., the ventral striatum and the orbitofrontal cortex) associated with reward, occurred

during a simulated driving task when participants were observed by peers compared to being alone. The socioemotional system is sensitized to the reward of garnering positive peer regard and acceptance that may result from risk taking with peers present. Three age-related groups of 40 participants (14 to 18, 19 to 22, and 24 to 29 years of age) participated in the study. The researchers used Magnetic Resonance Imaging (MRI) to measure brain region activity and the RPI (Steinberg & Monahan, 2007) to measure susceptibility to peer influence. Compared to adults, adolescents' socioemotional systems showed significantly greater activation in the presence of peers. Only adolescents took significantly more risks on the driving task when peers observed them compared to being alone. For all age groups, resistance to peer influence (RPI) scores were significantly and negatively related to the sensitivity of the socioemotional system when in the presence of peers. Participants higher in resistance to peer influence had socioemotional systems that were less sensitive to peer influence. These findings supported the salience of the ecological context (i.e., peer presence) as it interacts with adolescents' socioemotional systems.

Chien et al. (2010) also investigated the cognitive control system (lateral prefrontal cortex) that is involved in providing executive functioning to inhibit response (Luna et al., 2010), make focused plans (Lucianna, Collins, Olson,& Schissel, 2009), and control impulses (Steinberg, 2008). The cognitive control system continues to mature from preadolescence through the mid-20s (Asato, Terwilliger, Woo, & Luna, 2010; Giedd, 2008). Results indicated a significantly stronger engagement of the cognitive control system in adults than in adolescents, with emerging adults showing an intermediate effect, not significantly different from either adults or adolescents (Chien et al., 2010).

Resistance to peer influence and risk taking behaviors. Duncan, Boisjoly, Kremer, Levy, and Eccles (2005) studied peer influence among college roommates regarding binge

drinking, marijuana use, and multiple sex partners. They did a follow-up study on 714 participants 2.4 years after they completed the initial survey at college entrance in 1998, 1999, and 2000. The participants were divided into three groups: Both roommates binge drank in high school, neither roommate binge drank in high school, and one roommate binge drank and the other roommate did not binge drink in high school. Results indicated a significant, positive correlation between male roommates' binge drinking in high school and increases in their college binge drinking. This group of participants had almost four times more binge-drinking episodes per month compared to male roommates who did not binge drink in high school and compared to roommates one of whom binge drank in high school and one who did not. The correlation was significant only for males. No peer effects were found for males who used marijuana in high school and were assigned to roommates who used marijuana. Nonvirgin males assigned to nonvirgin male roommates had a greater number of sexual partners compared to nonvirgin males assigned to virgin roommates. No significant peer effects were found for females (Duncan, Boisjoly, Kremer, Levy, & Eccles).

Allen, Porter, and McFarland (2006) studied the relation between susceptibility to peer influence as a predictor of risky behavior (i.e., higher levels of substance use, sexual activity, externalizing behavior, greater numbers of depressive symptoms, and lower levels of popularity). Their sample was 177 seventh and eighth grade students whose median age was 13.6 years. The researchers measured susceptibility to peer influence using a lab-based assessment involving participants and their best friends making individual decisions about a hypothetical dilemma and then through discussion arriving at a consensual decision. The researchers hypothesized that adolescents who were easily influenced in this assessment would likely be more susceptible to involvement in negative behaviors and to psychopathology. Greater resistance to peer influence in the assessment discussions or ability to influence peers would protect adolescents against peer

influence in early adolescence. Results indicated that higher levels of susceptibility to peer influence were positively correlated with drug and alcohol use problems. Compared to adolescents with lower levels of susceptibility to peer influence, adolescents with higher levels of susceptibility to peer influence and who had peers with higher levels of substance use had significantly higher levels of substance use. For adolescents who were less susceptible to peer influence, researchers found little relation between their substance use and their peers' substance use. In regard to sexual activity, adolescents with higher levels of susceptibility to peer influence were more likely to report prior sexual activity. Adolescents whose scores were one standard deviation above the mean in susceptibility to peer influence were 2.2 times more likely to have reported prior sexual activity than adolescents who scored at the mean of susceptibility to peer influence. Gender differences in this study were not significant.

For years, parents have been intensely aware of adolescents' dressing, talking, and behaving like their peers and have been concerned that their adolescents and emerging adults may be influenced to participate in risky behaviors. Research has found that the ability to resist peer influence develops linearly overtime and involves many factors. Resistance to peer influence has been found to correlate with gender, maturity, development of specific brain structures, genetic vulnerabilities, and effects of interactions between individuals' biological processes and their environmental context. One explanation for the risk taking behavior among college students may be susceptibility to peer influence. Upon entering college, students are in a new environment without the familiarity and support of their high school peer groups. The college environment consists of a large number of peer models and opportunities to form new peer groups in which students seek to replace the acceptance of their high school peer groups or to attain peer group acceptance they lacked in high school. In this environmental and

psychological context, students may experience greater internal pressure to adopt the behavior of their peers' behavior.

Emotion Regulation

Researchers and theorists have given varying definitions for emotion regulation and have used different terms (e.g., self-control, self-regulation, behavior self-regulation). Some definitions focus on cognitive processes related to behavior control and others focus on emotion processes and the behaviors that manifest as a result of these processes. Other definitions of emotional regulation combine both cognitive and affective processes.

Bandura (1997) characterized self-control as the abilities to focus and shift attention, self-monitor, predict outcomes, and consider available options before deciding on a course of action. Behavior self-regulation has been defined as the inhibition of inappropriate behavior and delay of gratification (Barkley, 1997), as well as planning and guiding one's behavior (Tarter & Vanyukov, 1994).

Emotional self-regulation has been defined by Khantzian's model (Khantzian, Halliday, & McAuliffe, 1990) as the ability to cope with negative emotions (e.g., anxiety, depression, anger). This model emphasizes emotional self-regulation interacting with behavioral self-regulation, which may not be fully developed. Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth (2001) conceptualized coping as the way that individuals handle life's stressors adaptively by managing their emotions, controlling autonomic arousal, thinking constructively, regulating and directing their behavior, and acting on their social and nonsocial environments to alter sources of stress.

Eisenberg's (2004) view of emotion regulation is that individuals initiate, avoid, inhibit, maintain, or modulate the occurrence of their feelings, along with their intensity and duration. Individuals also regulate emotion-related physiological and attentional processes, as well as

motivational and behavioral processes that accompany their emotions. Through emotion-related self-regulation, individuals can accomplish emotion-related biological and social adaption and achieve individual goals.

Wills, Walker, Mendoza, and Ainette (2006) defined self-control as "the ability to focus and shift attention, monitor behavior, and link behavior to consequences over time" (p. 265). According to Mischel, Shoda, and Rodriguez (1989), self-control consisted of the ability to inhibit inappropriate behavior and delay gratification to realize a better outcome later. Baumeister, Dewall, Ciarocco, and Twenge (2005) characterized self-regulation as the capability to change behavior to conform to social standards to gain social acceptance. Most definitions of emotion regulation include individuals' ability to self-regulate that provides for positive adaptation to their environments and enhances their development and ability to attain personal goals.

Theories relative to self-regulation. Bowlby's (1973) theory of attachment posited that the ability to regulate emotions develops from the interaction between caregivers and children. The attachment relationship is an organized construct in which coordination and patterning of affective and behavioral responses occur between infants and their caregivers (Soufre & Waters, 1977). Within the attachment environment, emotional regulation strategies develop (Cassidy, 1994).

A major tenet of attachment theory is that individuals slowly build internal representations of their attachment figures and of the self over time, based on prompt, consistent, and sensitive responses of the attachment figure to their needs (Bowlby, 1973, 1977). In an affectively attuned, responsive attachment relationship, individuals develop confidence and trust that they will receive support and comfort that enhances the development of a positive sense of self and others (Bowlby, 1973). A secure attachment relationship develops from children's

feelings of security that their caregivers' are dependable and available. According to Bowlby, a secure attachment pattern influences how individuals cope in childhood and throughout the life span.

Research has found that individuals with an insecure-avoidant attachment patterns tend to inhibit affect whereas insecure-ambivalent attachment styles heighten affect (Magai, 1999). Studies of insecure-disorganized infants found that at school age the children showed a higher rate of externalizing problems (Lyons-Ruth, Easterbrooks, & Cibelli, 1997; Moss, Cyr, & Dubois-Comtois, 2004; Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998) and internalizing problems (Carlson, 1998; Moss, Cyr, & Dubois-Comtois, 2004; Moss, Rousseau, Parent, St-Laurent, & Saintonge, 1998) than any other group. In a study of the relation between adult attachment styles and emotional and cognitive reactions to stressful events, Mikulincer and Florian (1998) used a sample of 90 undergraduate students (30 students per attachment style) who were given either failure feedback or no feedback for completing concept-learning tasks. For participants in the insecure-avoidant and insecure-ambivalent groups, receiving failure feedback resulted in poorer performance on the concept-learning task, but not in the secure group. The secure group seemed able to cope with the negative effects of failure.

Lazarus and Folkman's (1984) model of coping distinguishes between problem-focused coping and emotion-focused coping. The model emphasizes specific coping strategies. Defining the problem, generating possible solutions, predicting possible outcomes are some strategies used in problem-focused coping. Emotion-focused coping includes participating in physical or cognitive activities in an attempt to decrease emotional distress (e.g., taking a positive view, focusing on something else, and avoiding the problem).

Avoidance theory is a coping theory with negative emotional states (Cooper, Frone, Russell, & Mudar, 1995). Avoiding aversive emotions minimizes the importance of examining

the problems and events that contribute to the negative emotions. Avoidant coping is considered maladaptive and often results in negative consequences (Cooper, Wood, Orcutt, & Albino, 2003).

Tension reduction theory of alcohol use posits that alcohol reduces the tension from negative emotional states (e.g., anxiety, fear, sadness, etc.; Cappell & Greeley, 1987). During an aversive emotional experience, individuals seek immediate relief. Even risky behaviors become tempting to achieve short-term relief in spite of long-term negative consequences. Tension reduction models have been developed for illicit drug use (Wills & Shiffman, 1985; Cooper et al., 2003) and engaging in risky sexual behavior to escape aversive mood states (Cooper, Shapiro, & Power, 1998). Substance use becomes a way to deal with negative affect for individuals' whose ability to soothe and calm themselves under stress is not well developed (Khantzian et al., 1990). Higher levels of affective lability have been associated with substance use (Simon & Carey, 2002), lower tolerance of distress (Brown, Lejuez, Kahler, & Strong, 2002), and relapse (Wills, Sandy, & Yeager, 2002).

Neurological processes. During adolescence and emerging adulthood, changes in brain structures and processes such as myelination of prefrontal brain areas and synaptic pruning improve connections between brain areas involving socioemotional and cognitive control systems that in turn, improve self-regulation (Steinberg et al., 2008). One important factor in understanding adolescent and emerging adult development is studying how cognitive skills (e.g., reasoning, decision-making), emotional skills, and behavior interact (Steinberg, 2005). Paus (2005) used magnetic resonance imaging (MRI) to study the brain/behavior relation during adolescence and emerging adulthood developmental stages. Brain mapping provides ways to identify the relation between brain development and behavior because it measures the maturational changes in specific brain structures and the connectivity/communication between

brain structures that process different types of information. Paus (2005) found a positive correlation between age and brain function. On tasks of executive functioning (e.g., working memory and response inhibition), determined mostly by the prefrontal cortex, participants 10 years of age performed at significantly higher levels than children 6 to 8 years of age, although, their performance was not significantly different from participants 15 to 20 years of age.

Pujol et al. (2002) investigated the association between the right cingulate gyrus and harm avoidance (i.e., worry about possible problems, fear of uncertainty, shyness with strangers, and fatigability). They used MRI images of 50 men and 50 women volunteers 20 to 40 years of age. They found that surface area of the right anterior cingulate gyrus accounted for a significant 24 % of the variance in the score on harm avoidance. This brain region was larger in women than in men and women scored significantly higher than men on harm avoidance.

Emotion regulation and risk taking behavior. Researchers found that self-regulation was related to early substance use (Wills, Sandy, Yaeger, Cleary & Shinar, 2001) and increased substance use during adolescence (Wills & Stoolmiller, 2002). Results of a study on adult self-regulation indicated that self-control was linked to vulnerability to substance use (Patock-Peckham, Chevy, Balhorn & Nagoshi, 2001). The findings suggested that self-regulation may be a relevant factor that reaches into adulthood.

Rafaelli and Crockett (2003) examined the association between self-regulation and sexual risk taking. They defined self-regulation as an internalized ability to regulate emotions, attention, and behavior. The researchers used a sample of 443 participants, 12 to 13 years of age at Time 1 and 16 to 17 years of age four years at Time 2. Rafaelli and Crockett found that self-regulation at Time 1 was significantly correlated in a negative direction with overall sexual risk taking four years later at Time 2. Among participants who were sexually active at Time 1, self-regulation

was significantly correlated in a negative direction with the number of sexual partners in the past year.

Simons and Carey (2002) studied the relation between affective lability and problems associated with college students' marijuana use. The researchers considered affective lability to be the speed, frequency, and range of changes in individuals' affective states. Using a sample of 592 freshmen and sophomores in introductory psychology classes, the researchers found that, after controlling for use frequency and gender, affect lability was significantly and positively associated with increased levels of problems resulting from marijuana use (Simons & Carey, 2002, 2006).

In a similar study, Simons (2003) examined the relation between affective lability and alcohol use in a population of 231 undergraduate students at a state university. Simons found that affective lability was a significant predictor of alcohol-use problems.

A sample of 235 adult volunteers from an inpatient substance use treatment program participated in a study on affective lability. Alcohol and methamphetamine-related problems, as well as with severity of alcohol dependence symptoms were positively related to affective lability (Simons & Carey, 2006; Simons, Oliver, Gaher, Ebel, & Brummels, 2005).

According to Westen (1994), the experience of aversive emotions is likely to lead to avoidant coping strategies, such as venting, denial, and behavioral and mental disengagement. Cooper et al. (2003) investigated the association between avoidance coping and predisposition to risky behaviors, using longitudinal data from a representative sample of 1,699 adolescents who were 13 to 19 years of age at Time 1 and 17 to 23 years of age at Time 2. The participants completed surveys at Time 1 and Time 2, four and a half years later. Avoidance coping significantly and positively predicted risky sexual behavior, number of partners, negative events, and alcohol, drug, and tobacco use. For individuals with little or no prior involvement in risky

behaviors, avoidance coping predicted their initial experimentation or increasing involvement in risky behaviors. The results suggested that self-regulation of emotions and consequent behaviors may be relevant contributors to adolescents' and emerging adults' risky behaviors (Cooper et al., 2003).

Quinn and Fromme (2010) investigated self-regulation, sensation seeking, and heavy episodic drinking, alcohol-related problems, and unprotected sex with monogamous and non-monogamous partners. Self-regulation was defined as the capacity to plan, set goals, and delay gratification. The participants were 3,046 entering freshmen 17 to 19 years of age at University of Texas who completed surveys for five years. Results revealed that low levels of self-regulation were significantly and negatively related to heavy drinking episodes. Self-regulation negatively and significantly predicted participation in unprotected sex with non-monogamous partners at five years. After controlling for gender and sensation seeking effects, high levels of self-regulation predicted fewer heavy drinking episodes and alcohol-related problems, as well as fewer occasions of unprotected sex with a non-monogamous partner. Generally, no differences were found between male and female participants in episodes of heavy drinking or unprotected sex with monogamous and non-monogamous partners. At the fifth year, men reported more alcohol-related problems than women and women reported higher levels of self-regulation.

An unexpected finding was that higher levels of self-regulation reduces the risk of engaging in unprotected sex with monogamous and non-monogamous partners during a heavy drinking episode, but only among participants with low sensation seeking. This finding may reflect evidence from neuroscience suggesting that sensation seeking levels may be related to individual differences in the sensitivity of the socioemotional system to related rewards (Quinn & Fromme, 2010).

Wills, Walker, Mendoza, and Ainette (2006) investigated the relation between behavioral self-control, emotional self-control, and adolescent substance use (i.e., alcohol, marijuana, tobacco). They used a sample of 1,091 students from middle and high schools in a public school district in metropolitan New York. Good behavioral control consisted of planfulness, problem solving, cognitive effort, and self-reinforcement. Poor behavioral control included distractibility and impulsiveness. Good emotional control involved the ability to self-soothe, control anger and sadness, whereas poor emotional control included anger reaction, anger rumination, sadness rumination, and affective lability. The researchers found that behavioral self-control and emotional self-control were two separate, but correlated, constructs. Good behavioral control and good emotional control were negatively associated with substance use. For the high school sample, affective lability was significantly related in a positive direction both to substance use and to anger rumination. The researchers suggested that behavioral self-control regarding planful action may be important in avoiding aversive situations, while emotional self-control may be important to individuals' responses when they are in problem situations.

Harrell and Karim (2008) investigated the association between substance-use coping, alcohol use frequency, and binge drinking. They used a sample of 266 female and 140 male college students, 17 to 26 years of age. Results indicated that substance-use coping was a significant correlate of more frequent alcohol use and binge drinking. Specifically, for males and females, substance-use coping was significantly and negatively related to alcohol use frequency and binge drinking. Alcohol use frequency was a significant predictor of substance use coping. Substance–use coping was significantly related to binge drinking for females and for males.

According to self-regulation theory, individuals with low levels of self-regulation would be less able to develop adaptive goals and monitor their progress toward those goals (Miller & Brown, 1991). Hustad, Carey, Carey, and Maisto (2009) studied the relation between self-

regulation, alcohol use, and alcohol-related problems in college students who were heavy drinkers. Participants were 170 college students who reported at least one heavy drinking episode per average week or at least four episodes in the past month. The study results indicated that self-regulation was a statistically significant predictor of the number of alcohol-related consequences, changes in alcohol-related consequences, and the changes in the number of drinks consumed per week. However, self-regulation was not related to the initial level of alcohol use. Hustad et al. concluded that lower levels of self-regulation should be considered as a risk factor for alcohol-related consequences, with higher levels of self-regulation reducing alcohol consumption and consequences associated with heavy drinking.

Researchers and theorists have studied and developed theories on the many facets and correlates of emotion regulation. Emotion regulation has been associated with attachment, brain structures, and coping strategies. Low levels of emotion regulation in adolescents, emerging adults, and adults have been linked to risk taking behaviors such as marijuana, drug, and alcohol use, substance use frequency, substance-use coping, binge drinking, and consequential problems.

Self-Efficacy to Resist Risk taking Behavior

"The capacity to exercise control over the nature and quality of one's life is the essence of humanness" (Bandura, 2001, p. 16). Self-efficacy, a major tenet of social learning theory, is the belief that individuals have in their ability to successfully perform a task or behavior (Bandura, 1986). Self-efficacy beliefs are essential to individuals' ability to act on their environment. Self-efficacy beliefs determine if individuals choose to attempt a task, the effort they expend, and the length of time they persevere. Specific to a particular task or situation, self-efficacy beliefs do not generalize to other tasks or contexts (Bandura, 1982). According to social learning theory, self-efficacy beliefs are key to self-regulation and life management (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). Bandura's (1977, 1997) social learning

theory postulates that self-efficacy beliefs stem from four types of experiences: Performance success, vicarious learning, verbal inducement, and physiological experiences. Individuals' thoughts, actions, and emotions interact dynamically (Bandura, 1982). In managing situational experiences, perceived self-efficacy includes individuals' judgments of how successful they can be taking courses of action that are necessary to deal with expected situations.

In the process of navigating the environment, self-efficacy beliefs involve the organization of behavioral, cognitive, and social skills necessary to take many courses of action to deal with various situations (Bandura, 1986). Self-regulatory efficacy, the belief of control over personal behavior, requires confidence that these skills can be used to regulate actions. Individuals with the skills and belief in their ability to self-regulate can be expected to expend the necessary effort to succeed in managing high-risk situations.

Cohen and Fromme (2002) explored the association between self-efficacy beliefs to engage in preventative behaviors and risky substance use and sexual behavior. Using a sample of 375 first-year college students with an average age of 18 years, the researchers found that substance use and high-risk sexual behavior were significantly related to self-efficacy beliefs for prevention. Self-efficacy beliefs for prevention directly influenced sexual risk taking behavior. Participants with higher levels of self-efficacy prevention beliefs engaged in sexual risk taking behavior less often than participants with lower levels of self-efficacy prevention beliefs.

Social learning theory asserts that self-efficacy beliefs function within social relations and environmental influences rather than in isolation (Bandura, 1986). Caprara, Regalia, and Bandura (2002) studied the relation between perceived self-regulatory efficacy to resist peer pressure to engage in high-risk behaviors (e.g., substance abuse) and delinquency (e.g., truancy, theft, vandalism, fighting, use of weapons). Participants were 350 students with a mean age of 16 years in phase 1 and a mean age of 18 years in phase 2 of the study. Results indicated that

participants with higher levels of perceived self-regulatory efficacy to resist peer pressure to engage in high-risk activities were significantly less likely to participate in high-risk behaviors and in delinquency than participants with lower levels of perceived self-regulatory efficacy in phase 1 and phase 2. Females reported higher levels of self-regulatory efficacy than males, whereas males were more likely to engage in higher levels of violent behavior than females. Additionally, perceived self-regulatory efficacy and parental communication decreased the likelihood of substance abuse and delinquency in phase 1 and phase 2. The findings showed that participants with higher levels of self-regulatory efficacy to resist peer pressure communicated more openly about their problems and behavior to their parents and had low participation in delinquent and substance abuse activities than participants with lower levels of self-regulatory efficacy to resist peer pressure. However, only perceived self-efficacy to resist peer pressure and not parental communication had an effect on behavior over time.

Bandura, Caprara, Barbaranelli, Gerbino, and Pastorelli (2003) investigated the association between perceived self-efficacy to regulate positive and negative affect and perceived self-efficacy to resist peer pressure for risk taking activities (e.g., alcohol and drug use, theft, destructiveness, truancy). They used a sample of 464 students 14 to 19 years of age at Time 1 and 16 to 21 years of age at Time 2. The results indicated that higher levels of perceived self-efficacy to regulate emotions contributed to perceived self-efficacy to resist peer pressure. Compared to males, females reported significantly higher levels of perceived self-efficacy to resist peer pressure.

Caprara, Barbaranelli, Pastorelli, and Cervone's (2004) investigated whether or not perceived self-regulatory efficacy could predict engagement in risk taking behavior above and beyond individual differences in the five-factor model of personality traits: Energy/extraversion, agreeableness, conscientiousness, emotional instability, and intellect/openness (McCrae & Costa,

1999). The participants were 489 students ranging in age from 10 to 14. The researchers found that higher levels of perceived self-regulatory efficacy to resist peer pressure to engage in risk taking behavior significantly predicted lower levels of risk taking behavior after controlling for the five personality constructs.

Research has been conducted on the relation between alcohol expectancies and use frequency and consumption quantity (Young, Oei, & Crook, 1991). In accordance with social learning theory, cognitive factors of expectancies and self-efficacy have been found to influence alcohol use frequency and consumption quantity (Lee & Oei, 1993). In regard to alcohol use, drinking refusal self-efficacy involves individuals' perceived ability to resist drinking in situations where inducement is high.

Skutle (1999) examined the association between drinking refusal self-efficacy expectancies and two aspects of alcohol abuse, severity of abuse and perceived psychological benefits (i.e., improved social skills, less depression and stress, improved cognition). The sample included 203 adult male patients in treatment for alcohol abuse and problems. The participants ranged in age from 22 to 67 years of age with a mean age of 42.8 years. Eighteen percent of the sample was 18 to 29 years of age. The findings revealed that higher levels of alcohol abuse were significantly and negatively related to lower levels of drinking refusal self-efficacy. Compared to moderate alcohol abusers, heavy alcohol abusers had significantly lower levels of self-efficacy beliefs to cope with high-risk situation. Higher levels of severity of alcohol abuse and higher levels of perceived psychological benefits from alcohol were significantly related to lower levels of expected self-efficacy to cope with high-risk situations involving heavy drinking. Moderate levels of alcohol abuse severity and lower levels of expected psychological benefits were significantly associated with higher levels of coping self-efficacy in high-risk situations.

Young, Connor, Riccardelli, and Saunders (2006) investigated the relation between drinking refusal self-efficacy beliefs and alcohol expectancies and the severity of alcohol dependence, frequency of use, and quantity of alcohol consumption in university students. The sample was 174 undergraduate students enrolled in an Australian university, with a mean age of 24.6 years and a range from 17 to 70 years of age. The researchers found that positive alcohol expectancies (e.g., improved social skills, less tension and stress) scores on the Drinking Expectancies Questionnaire-Revised (DEQ-R; Young and Knight, 1989; Young & Oei, 1996) were significantly and negatively correlated with drinking refusal self-efficacy scores on the Drinking Refusal Self-Efficacy Questionnaire-R (DRSEQ-R; Young et al., 1991; Young & Oei, 1996). Positive alcohol expectancies accounted for 19.1% of the variance of frequency of student drinking. Drinking refusal self-efficacy explained an additional 5.1% of the variance of frequency. In this study the students' usual mode of drinking was binge drinking, heavy episodic drinking. Positive alcohol expectancies explained 12.8% of the variance of the quantity of alcohol consumption, with drinking refusal self-efficacy explaining an additional 5.9% of the variance of quantity of alcohol consumption.

Lee and Oei (1993) studied the association between alcohol expectancies and drinking refusal self-efficacy in a general community sample of 185 mostly Australian participants with an average of 31.2 years, ranging from 14 to 62 years of age. In this study, drinking refusal self-efficacy had a more salient role than alcohol expectancies in regard to quantity and frequency of alcohol consumption. The alcohol expectancies (AE) scores on the Drinking Expectancy Profile (DEP; Young & Knight as cited in Lee & Oei, 1993) were significantly and positively associated with maximum quantity of alcohol consumption. The drinking refusal self-efficacy (DRSE) subscale scores of the Drinking Expectancy Profile (DEP; Young & Knight as cited in Lee & Oei, 1993) were significantly and negatively related to general frequency and maximum quantity

of alcohol consumption. The opportunistic scale (i.e., having the opportunity to drink) of DRSE score was the strongest predictor of general frequency of alcohol consumption.

Oei and Burrow (2000) investigated the relation between DRSE and AE and the quantity of alcohol, caffeine, and nicotine consumption. The researchers used a sample of 161 first year psychology students with a mean age of 20 years, ranging from 17 to 41 years of age. These students consumed each of the three substances daily. In the first multiple regression analysis, only DRSE predicted a significant proportion (8%) of the variance in alcohol consumption. In two post hoc regression analyses controlling for DRSE, alcohol expectancies explained a significant proportion (6%) of the variance in alcohol consumption. When DRSE was entered at the second step, it explained an additional 10% of the variance in alcohol consumption. Entered at the first step, DRSE accounted for a significant proportion (16%) of the variance in alcohol consumption. Results indicated that alcohol expectancies and drinking refusal self-efficacy do not predict smoking or caffeine use. The findings supported Bandura's (1986) concept that self-efficacy beliefs relate to a specific behavior and do not generalize to other activities.

Oei, Fergusson, and Lee (1998) investigated how well alcohol expectancies and drinking refusal self-efficacy were able to differentiate between social drinkers and problem drinkers. The participants were 276 individuals from a community and a clinical population in an east coast Australian city. The community sample ranged from nondrinkers to heavy drinkers who were not in treatment for a substance problem at the time of the study. The community participants ranged in age from 18 to 62 years, with a mean age of 31.2 years. The clinical sample, ranging from 20 to 65 years of age, had a mean age of 35.7 years. These participants were drawn from inpatient, detoxification, and outpatient centers. The results indicated that alcohol expectancies and drinking refusal self-efficacy (DRSE) predicted light, moderate, and problem drinkers. Three subscales (social, emotional, and opportunistic) of the Drinking Refusal Self-Efficacy

Questionnaire, (DRSEQ, Young et al., 1991; Young & Oei, 1996) and the total score of the Short-form Alcohol Dependence Data Questionnaire (SADD, Davidson & Raistrick, 1986) had the highest correlations with alcohol consumption in social drinkers. The total score of the Drinking Expectancy Questionnaire (DEQ; Young & Knight, 1989; Young & Oei, 1996) and the total score of the SADD had the highest correlations with alcohol consumption for the clinical sample.

Generally, research has reported that self-efficacy beliefs regarding the ability to resist engaging in risk taking behavior involving substance use and sexual activity have been found to correlate negatively with involvement in these risk taking activities. Drinking refusal self-efficacy beliefs have been found to have a negative relation with frequency and quantity of alcohol consumption. Overall, research has demonstrated that compared to males, females have higher levels of self-efficacy to resist substance use and risky sexual activities.

Summary

In summary, this literature review has demonstrated consistent links among risky alcohol, drug, and sex behaviors, sensation seeking, perceived peer influence, general resistance to peer influence, emotion regulation, and self-efficacy to resist peer influence in regard to emerging adult college students. However, this review also reveals that more research is needed in the area of risk taking behaviors among emerging adult college students. Research is mixed regarding the decline of risk taking behaviors with age. Some studies have found increases in risk taking behaviors among students during the transition to college compared to high school use levels and compared to use levels of peers not attending college. Examining factors contributing to emerging adult college students' risk taking behavior may result in findings that could be relevant to treatment modalities.

CHAPTER 3

METHOD

Research Design

A nonexperimental, correlational research design was used in this study. This type of design was used to determine the strength and direction of relations among two or more quantifiable variables (Gay, Mills, & Airasian, 2008). Correlation studies are used to understand the relations among complex variables. The primary data collection tools that were used in this study were surveys. Correlational studies do not encounter the same threats to internal and external validity as experimental studies. As data were collected once, the threats of regression to the mean, instrumentation, and maturation were not considered problematic in correlational research. However, the researcher must be aware of any uncontrolled extraneous variables that could affect the outcomes of the study.

Participants

The participants for the study were from a large, comprehensive university located in an urban area of the Midwest. The university provides both graduate and undergraduate programs. The study was limited to undergraduate students. For the Winter 2011 semester, approximately 19,309 students were enrolled in undergraduate programs. Of this number, 11,086 were female and 8,223 were male. Students were of varied ethnic backgrounds, including: African American (n = 5,663, 33.1%); American Indian/Alaskan Native (n = 88, 0.5%); Asian/Pacific Islander (n = 1,404, 5.4%); Hispanic/Latino (n = 581, 2.5%); European American (n = 9,315, 47.5%); non-resident alien (n = 545, 4.3%); and race-ethnicity unknown (n = 1,602, 6.7%). Approximately 3,000 students were living on campus in university housing, including 2,100 undergraduates. Participants included emerging adults enrolled in undergraduate courses at a large urban university. These students ranged from 18 to 25 years of age.

A power analysis using G*Power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009) was used to determine the appropriate sample size for the study. An effect size of .15, alpha level of .05, power of .95, and nine predictor variables were used in this analysis. The outcomes indicated that a sample size of 89 was expected to yield a power of .95. However, to obtain a sample with a sufficient number of students with high sensation seeking scores, the minimum sample size was increased to 400.

Description of the Sample

Survey packets were distributed to 925 students who were attending classes or were on campus at a large urban university. Of this number, 437 students completed and returned the surveys. Fourteen surveys were unusable because of missing data. The response rate for the study was 45.7%.

The demographic survey was completed by 151 (35.8%) male and 271 (64.2%) female students. One student did not identify his/her gender on the survey and was not included in the analysis of the demographic characteristics. The responses to the categorical items were crosstabulated by gender, with chi-square tests for independence used to determine the association between gender and demographic characteristics. The responses to the continuous variable, age of the student, were summarized using descriptive statistics, with t-tests for two independent variables used to determine if a statistically significant difference existed in age of the respondents by gender. Table 1 presents results of this analysis.

Table 1

Descriptive Statistics – Age by Gender

					Range	
Gender	*N*	*M*	*SD*	Median	Minimum	Maximum
Male	151	19.77	1.94	19	18	25
Female	271	19.60	1.70	19	18	25
Total	422	19.66	1.79	19	18	25
t (420) = .92, *p* = .359						

The mean age of the students was 19.66 (*SD* = 1.70) years, with a median of 19 years. The range of ages of the study was from 18 to 25 years. Male students were slightly older (*M* = 19.77, *SD* = 1.94) than female students (*M* = 19.60, *SD* = 1.70). To determine if the ages of the male and female students were statistically significantly different, t-tests for two independent samples was used. The results of this analysis were not statistically significant, t (420) = .92, p = .359. Based on these findings, the ages of the male and female students were not different.

The ethnicity of the students was crosstabulated by gender of the student. The results of this analysis are presented in Table 2.

Table 2

Crosstabulations – Ethnicity by Gender (N = 422)

	Gender					
	Male (*n* = 151)		Female (*n* = 271)		Total	
Ethnicity	*N*	%	*N*	%	*N*	%
African American	23	15.2	52	19.3	75	17.9
American Indian/ Alaskan Native	1	0.7	0	0.0	1	0.2
Asian/Pacific Islander	19	12.6	39	14.5	58	13.8
European American/ Caucasian	84	55.7	127	47.3	211	50.2
Latino/Latina	2	1.3	13	4.8	15	3.6
Middle Eastern	15	9.9	24	8.9	39	9.3
Other	7	4.6	14	5.2	21	5.0
Total	151	100.0	269	100.0	420	100.0

χ^2 (6) = 7.81, p = .252

Missing: Female 2

The largest group of students (n = 211, 50.2%) reported their ethnicity as European American/Caucasian. This number included 84 (55.7%) male and 127 (47.3%) female students. Of the 75 (17.9%) students who indicated their ethnicity as African American, 23 (15.2%) were male and 52 (19.3%) were female. The third largest group of students (n = 58, 13.8%) were Asian/Pacific Islanders. Of this number, 19 (12.6%) were male and 39 (14.5%) were female. Chi-square tests for independence were used to determine if there was an association between gender and ethnicity. The results of this analysis were not statistically significant, χ^2 (6) = 7.81, p = .252, indicating that gender and ethnicity were independent.

The students were asked to indicate their relationship status, living arrangements, and socioeconomic status. Their responses were crosstabulated by gender for presentation in Table 3.

Table 3

Crosstabulations – Relationship Status, Living Arrangements, and Family Socioeconomic Status (N = 422)

Relationship Status, Living Arrangements, and Family Socioeconomic Status	Gender					
	Male (*n* = 151)		Female (*n* = 271)		Total	
	N	%	*N*	%	*N*	%
Relationship Status						
Single	108	71.5	169	62.4	277	65.6
Married	2	1.3	5	1.8	7	1.7
Committed relationship	40	26.5	94	34.7	134	31.8
Divorced	0	0.0	2	0.7	2	0.5
Other	1	0.7	1	0.4	2	0.4
Total	151	100.0	271	100.0	422	100.0
χ^2 (4) = 4.74, *p* = .315						
Living Arrangements						
At home with parents	88	58.3	156	57.6	244	57.8
On campus in dorm	36	23.8	76	28.0	112	26.6
Independently off campus	22	14.6	32	11.8	54	12.8
Other	5	3.3	7	2.6	12	2.8
Total	151	100.0	271	100.0	422	100.0
χ^2 (3) = 1.41, *p* = .703						
Family Socioeconomic Status						
Lower	0	0.0	2	0.8	2	0.5
Lower middle	18	12.5	15	6.3	33	8.6
Middle	33	22.9	55	23.1	88	23.0
Upper middle	61	42.4	94	39.5	155	40.6
Upper	32	22.2	72	30.3	104	27.2
Total	144	100.0	238	100.0	382	100.0
χ^2 (4) = 7.51, *p* = .111						

The majority of the participants (*n* = 277, 65.6%) reported their relationship status as single. Included in this number were 108 (71.5%) male and 169 (62.4%) female students. Of the 134 (31.8%) students who reported being in a committed relationship, 40 (26.5%) were male and 94 (34.7%) were female. Two (0.7%) female students reported their marital status as divorced. The results of the chi-square test for independence was not statistically significant, χ^2 (4) = 4.74, *p* = .315, indicating that gender was independent of relationship status.

Most of the participants (n = 244, 57.8%), including 88 (58.3%) male and 156 (57.6%) female students, were living at home with their parents. Of the 112 (26.6%) students who were living on campus in dorms, 36 (23.8%) were male and 76 (28.0%) were female. Twenty-two (14.6%) male and 32 (11.8%) female students were living independently off campus. The association between gender and living arrangements was tested using chi-square test for independence. The results of this analysis was not statistically significant, χ^2 (3) = 1.41, p = .703, indicating no association between gender and living arrangements.

The family socioeconomic status was obtained from the students using the procedure developed by Hollingshead (1975). The educational level and occupation type of the parents were weighted to obtain a value for the socioeconomic status for each parent. If both parents were employed, the two socioeconomic statuses were averaged to obtain the family socioeconomic status. If only one parent was employed or present, the socioeconomic status of that parent was used as the family socioeconomic status. Socioeconomic status was categorized into five levels ranging from lower status to upper status. The largest group of participants in the present study (n = 155, 40.6%) was in families with upper middle socioeconomic statuses. This number included 61 (42.4%) male and 94 (39.5%) female students. Of the 104 (27.2%) students whose family socioeconomic status was considered upper, 32 (22.2%) were male and 72 (30.3%) were female. Two (0.8%) female students were from families whose socioeconomic status was considered low. The results of the chi-square test for independence was not statistically significant, χ^2 (4) = 7.51, p = .111, providing support that gender was not associated with family socioeconomic status.

The students were asked to indicate their year in college and their major (using three categories: liberal arts, science, and other). Their responses were crosstabulated by gender for presentation in Table 4.

Table 4

Crosstabulations – Year in College and College Major (N = 422)

Year in College and College Major	Gender					
	Male (*n* = 151)		Female (*n* = 271)		Total	
	N	%	*N*	%	*N*	%
Year in College						
Freshman	77	51.0	136	50.4	213	50.6
Sophomore	24	15.9	63	23.3	87	20.7
Junior	31	20.5	48	17.8	79	18.8
Senior	19	12.6	20	7.4	39	9.3
Other	0	0.0	3	1.1	3	0.7
Total	151	100.0	270	100.0	421	100.0
χ^2 (4) = 7.47, p = .113						
College Major						
Liberal Arts	43	28.7	101	37.5	144	34.4
Science	60	40.0	100	37.2	160	38.2
Other	47	31.3	68	25.3	115	27.4
Total	150	100.0	269	100.0	419	100.0
χ^2 (2) = 3.70, p = .157						

The majority of the participants (n = 213, 50.6%) indicated they were in their freshman year in college. This number included 77(51.0%) male and 136 (50.4%) female students. Nineteen (12.6%) male and 20 (7.4%) female students indicated they were in their senior year. The results of the chi-square test for independence was not statistically significant, χ^2 (4) = 7.47, p = .113, providing evidence that gender was independent of year in college.

The largest group of students (n = 160, 38.2%), including 60 (40.0%) male and 100 (37.2%) female students, indicated their college major was science. Of the 144 (34.4%) students who reported their college major was liberal arts, 43 (28.7%) were male and 101 (37.5%) were female. A chi-square test for independence was used to determine if an association existed between gender and college major. The results of this analysis were not statistically significant, χ^2 (2) = 3.70, p = .157, indicating that gender was independent of college major.

Measures

A demographic survey was created for the purposes of this study. Questions included: age, gender, ethnicity, relationship status, living arrangement, year in college, major, and parents' education. Six additional instruments were used to measure the constructs proposed in this study. Each instrument, along with the psychometrics for the instrument is described in this section.

Cognitive Appraisal of Risky Events Questionnaire (CARE; Fromme et al. 1997)

The Cognitive Appraisal of Risky Events Questionnaire (CARE; Fromme et al. 1997) was used to measure young adults' outcome expectancies about the risks and benefits associated with risky behavior. The CARE has 30 items with four standard scales; past frequency of involvement, expected risk scale, expected benefit scale, and expected involvement scale. The past frequency of involvement scale asks for the number of times respondents have engaged in each activity in the last six months. In addition, the students were asked to rate the items based on perceptions of the extent to which their peers are involved in the behaviors. The students rated each of these scales using a 5-point Likert-type scale ranging from 1 for never to 5 for often.

Six subscales are measured on each of the four scales; illicit drug use, risky sexual activities, heavy drinking, aggressive and illegal behaviors, high risk sports, and academic or work behaviors. For the purpose of the present study, three of the subscales, illicit drug use, risky sexual activities, and heavy drinking were used. The students were asked to rate the items twice, once based on the frequency that they engaged in each of the behaviors in the past six months (actual involvement) and a second time based on their perceptions of the extent to which their peers were involved in the behaviors (perceived peer involvement).

The numeric ratings for each of the subscales (illicit drug use, risky sexual activities, heavy drinking) were summed to obtain a total score. The total score was divided by the number

of items on each subscale to calculate a mean score for each participant. The advantage of using a mean score is that the results are in the unit of measurement of the original scale and comparisons can be made between subscales and scales.

A multi-dimensional construct was found using chi-square difference tests for expected risk, benefit, and involvement for which a six-factor model provided a better fit than a one-factor model with ($p < .001$). Cronbach's alpha coefficients were used to provide support that internal consistency as a measure of reliability was adequate for the six factors. The obtained alpha coefficients ranged from .64 to .90. Ward (2010) assessed the internal consistency of the CARE using a sample of undergraduate college students in a large urban university. Her obtained alpha coefficients for illicit drug use (.81), risky sexual behaviors (.64), and heavy drinking (.90) provided support that the instrument has adequate internal consistency for use with college students. Pearson correlation coefficients were used to examine the covariation among expected risk, benefit, and involvement ratings for each subscale. Intercorrelation coefficients ranged from r = .02 (expected risk for sex and sports) to r = .68 (expected risk for aggression and academic/work behaviors). Item-total correlations provided further support for internal consistency. Test-retest reliability was determined by computing Pearson correlation coefficients between scores for the expected risk and expected benefit measures for the first and second administrations that were completed 10 days apart. The test-retest correlations for expected risk ranged from $r = .51$ to .65 and for expected benefit ranged from $r = .58$ to .79 were statistically significant at $p < .001$ (Fromme, Katz, & Rivet, 1997). According to Fromme et al., the test-retest correlations were modest, but were similar to other expectancy questionnaires like the Marijuana Effect Expectancy Questionnaire that had a test-retest correlation of $r = .66$.

Construct validity and item content was assessed using three factor analyses for expected risk, expected benefit, and expected involvement. Items that loaded below .40 for at least two of

the three analyses and items that loaded equally well on more than one factor within an analysis were deleted (Fromme, Katz, & Rivet, 1997). Ultimately, this resulted in a six-factor model that provided an adequate fit for the item analysis of the data and better than a one-factor model.

Katz, Fromme, & D'Amico (2000) tested the CARE for construct validity by correlating the CARE with sensation seeking and impulsivity, and social conformity. All four of the traditional risk behaviors (i.e., drug use, alcohol use, unsafe sex, and aggression), frequency of involvement, expected benefit, and expected involvement rating were significantly correlated in a positive direction with the Impulsive Unsocialized Sensation Seeking Scale (ImpUSS) scale is part of the new Zuckerman-Kuhlman Personality Questionnaire-III; Zuckerman, Kuhlman, Joireman, Teta & Kraft, 1993). A statistically significant correlation in a negative direction was found with the Social Conformity Questionnaire (SCQ; Newcomb & Bentler, 1989).

According to Katz et al. (2000), criterion validity was assessed by using a 10-day follow-up self-report of actual involvement in the six risky behaviors measured on the CARE. The actual involvement was used as a predictor variable, along with expected risk, expected benefit, and expected involvement scores in hierarchical multiple linear regression analysis. The criterion variables in these analyses were the six subscale scores. For two of the subscales (illicit drug use and heavy drinking), the amount of variance in past behaviors explained by current behavior was statistically significant. This analysis provided support for the criterion validity of the CARE.

The Cognitive Appraisal of Risky Events-Revised (CARE-R, Fromme, D'Amico, & Katz, 1999; Katz, Fromme, & D'Amico, 2000) is a 28-item measure that assesses risks involved in drinking, drug use, and risky sexual behavior with a new and regular partner over the past six months. The CARE-R was developed by Fromme et al. to provide a shorter, more specific measure of risky behavior for alcohol, drugs, and sex. Sexual coercion for men and being sexually coerced for women are also assessed. A 7-point Likert scale is used to quantify the

frequency of involvement during the past six months. Scoring is accomplished by computing average scores for each of the three factors. Past frequency scale items are summed to obtain a total score. Separate scores may be used for the Risky Sex with a Regular Partner or with a New Partner. Scoring for the five coercive items were gender specific. Fromme, D'Amico, & Katz (1999) in a study of intoxicated sexual risk taking used the CARE-R questionnaire to assess perceptions of unsafe sexual activities with "new" and "regular" partners in regard to expected risk, benefit, and involvement in four sexual practices. Cronbach's alpha coefficients indicated good internal reliabilities for all scales ranging from .82 to .94. For the purpose of the present study, the CARE-R was used to measure emerging adults' risky behaviors. For the purpose of the present study, the participants were asked to rate the items on the CARE-R twice, once for the frequency of their own involvement in sex, drugs, and alcohol, with the second rating based on their perceptions of their peers' involvement in the three constructs, sex, drugs, and alcohol.

The ratings for the present study were tested for internal consistency using Cronbach alpha coefficients. Table 5 presents the alpha coefficients for both the participants' frequency of involvement and their perceptions of their peers' involvement in sex, drugs, and alcohol.

Table 5

Alpha Coefficients: CARE-R Frequency of Involvement and Perceptions of Peer Involvement

	Frequency of Involvement (Self)		Perceptions of Peer Involvement	
Subscale	N	α	N	α
Risky Sex	385	.83	381	.96
Risky Drugs	359	.58	333	.84
Risky Alcohol	410	.88	328	.93

The alpha coefficents ranged from .58 (risky drugs – self-involvement) to .96 for risky sex (perceptions of peer involvement), providing support that the instrument has from fair to excellent internal consistency as a measure of reliability.

The Sensation Seeking Scale (SSS-V; Zuckerman, Eysenck, & Eysenck, 1978)

The Sensation Seeking Scale (SSS-V; Zuckerman et al., 1978) is a 40-item, forced-choice inventory developed to measure stimulation and arousal preferences. The SSS-V consists of four 10-item subscales; (a) thrill and adventure seeking, (b) experience seeking, (c) disinhibition, and (d) boredom susceptibility. Each of the 40 items includes two statements, one that reflects sensation seeking, with the other indicating nonsensation seeking. Students were asked to select the choice that was most like them. The SSS-V is the most widely used scale to measure sensation seeking and has the greatest amount of psychometric data to support it.

The scores for each of the subscales were obtained by counting the number of items for which the respondent indicated the sensation seeking alternative. The total score was the sum of the subscale scores (Zuckerman et al., 1978). For the purpose of the present study, only the total score was used.

Internal consistency as a measure of reliability was determined using Cronbach's alpha coefficients. According to Zuckerman et al. (1978), alpha coefficients ranged from .83 to .86 for the four subscales. The alpha coefficient for the total score of the SSS-V was .84 for males (n = 160) and .85 for females (n = 170; Zuckerman, 1994). Internal consistency coefficients for the four subscales for male and female participants respectively were: thrill and adventure seeking (.77, .77), experience seeking (.61, .61), disinhibition (.74, .76), and boredom susceptibility (.57, .56). Stability as a measure of reliability was determined at a 3-week interval. The test-retest coefficient for the total scale was .94 for the men and women as a group. The SSS-V was used in a study of sensation seeking among high and low-risk sports participants (Jack & Ronan, 1998).

In this sample, internal consistency coefficients for the four subscales of the SSS-V ranged from.56 to .68. Jack and Ronan (1998) found positive and significant intercorrelations among the four subscales, ranging from .21 ($p < .01$) to .76 ($p < .001$). Trimpop, Kerr, and Kirkcaldy (1999) tested the SSS-V for reliability using Cronbach alpha coefficients. The alpha coefficients ranged from .62 for experience seeking to .72 for disinhibition. A study by Loas et al. (2001) tested the reliability of the SSS-V using Kuder-Richardson 20. The findings provided coefficients ranging from .50 to .78 for participants in the healthy sample and .46 to .82 for participants in the addictive sample. According to Loas et al., a coefficient of .83 was obtained for the total scale. The alpha coefficient for the total scale was .80. Kuder-Richardson 20 was used by Greene et al. (2000) to test the SSS-V for reliability. The obtained coefficients ranged from .61 for boredom susceptibility to .83 for disinhibition. No information was provided on the outcome for the total scale.

Kuder-Richardson 20 was used to determine the internal consistency of the SSS-V scale for the present study. The KR-20 for the total scale was .81, which was comparable to the KR-20 obtained in earlier studies (Green et al., 2000; Loas et al., 2001). Based on this finding, it appears that the SSS-V was reliable for the sample in the present study.

Construct validity was determined using a principal components factor analysis with a varimax rotation to examine the factor structure of the 40-item SSS-V (Zuckerman et al., 1978). The criteria for inclusion of an item on a factor was a primary loading greater than .30 and no items loading high on more than one factor. Four factors emerged from the factor analysis providing construct validity of the SSS-V. Confirmatory factor analysis by Rowland and Franken (1986) provided additional evidence of the four factor results by Zuckerman et al. (1978). Birenbaum (1986) used a sample of Israeli male applicants for security-related positions to investigate the factor structure of the SSS-V. He used a nonmetric multidimensional scaling

method instead of a principal components factor analysis. He found a good fit for the Israeli data, further supporting the factor structure of the SSS-V.

Cazenave, Le Scanff, and Woodman (2007) used the SSS-V to assess the degree of sensation seeking among three groups of women who were engaged in non-risk sports (Group 1), risk taking sports for leisure activities (Group 2), and professionals in risk taking sports (Group 3). Statistically significant differences were found among the three groups, indicating the instrument was able to discriminate among different populations. A study by Daderman, Meurling, and Hallman (2001) found statistically significant differences for all subscales on sensation seeking among juvenile delinquents, Air Force pilot recruits, and a control group. These differences support the ability of the SSS-V to discriminate among diverse groups. Loas et al. (2001) used a confirmatory factor analysis to test the factor structure of the SSS-V. Their results provided evidence that the factors derived by Zuckerman et al. (1978) were adequate for measuring the four subscales of sensation seeking.

Resistance to Peer Influence (RPI; Steinberg & Monahan, 2007)

The Resistance to Peer Influence Scale (RPI; Steinberg & Monahan, 2007) measures individuals' level of general susceptibility to peer influence. The scale uses neutral peer influence situations to decrease the influence of giving a socially approved answer. In neutral situations compared to specific situations, individuals may be more likely to admit being influenced by peers and answer in a non-defensive manner. The items are presented in a way that there are no right and wrong answers (Sumter, Bokhorst, Steinberg, & Westenberg, 2009). The scale is applicable to individuals from late childhood (10 years of age) through young adulthood. The scale consists of 10 items of which 3 (items 2, 6. 10) are reverse-scored. Each item presents two acceptable choices. For example, "Some people go along with their friends just to keep their friends happy" BUT "Other people refuse to go along with what their friends want to do, even

though they know it will make their friends unhappy". The participants have to choose between the two items that most reflects their susceptibility to peer influence and to what degree (Sumter et al., 2009).

Responses are rated using a 4-point scale ranging from 1 or 4 for 'really true' to 2 or 3 for 'sort of true' of me (Steinberg & Monahan, 2007). Scoring is accomplished by reading left to right on the instrument, scoring each item from 1 to 4. Items 2, 6, and 10 are reverse scored prior to scoring. Scores for valid responses are summed and divided by the number of valid items. Possible scores could range from 1 to 4, with higher scores indicating greater ability to resist peer influence. The recommendation is that at least 7 items have valid responses (Steinberg & Monahan).

Steinberg and Monahan (2007) tested the RPI's internal consistency using Cronbach's alphas with four large samples (700 to 1350 individuals). The results of the studies indicated that the Cronbach's alphas (internal reliability) were adequate and highly similar: a sample of 1350 juvenile offenders from 14 to 18 years of age who were mostly impoverished and an ethnic minority (α = .73); a sample of 700 individuals from 11 to 24 years of age in jail or juvenile detention (α = .76), a sample of 700 predominantly poor and working class individuals in four U.S. cities (α = .70), and 935 individuals from 10 to 30 years of age living in five regions of U.S. multiethnic working and middle class communities (α = .74).

Monahan and Piquero (2009) used the RPI to assess the ability to interact with peers in an autonomous manner, using a sample of individuals 14 to 17 years of age who had been convicted of a felony or a serious non-felony offense, a misdemeanor. The researchers examined the RPI's internal consistency at baseline interview using Cronbach's alpha, finding adequate internal consistency (α = .73).

The responses to items on the RPI for the present study were tested for internal consistency using Cronbach alpha coefficients. The obtained alpha coefficient was .78, which was similar to the results of earlier studies.

Sumter, Bokhorst, Steinberg, and Westenberg (2009) used the RPI in a study 464 adolescents. The results of the Cronbach alpha provided evidence of adequate internal consistency ($\alpha = .73$), which was considered comparable to the original alpha coefficient of .74 obtained by Steinberg and Monahan (2007).

The analysis of the data from the samples of the study demonstrate validity of the instrument (Steinberg & Monahan, 2007). Within each sample (Lower Income, Detained, Community, and Serious Offender) the confirmatory factor analysis statistics found adequate normed fit index, .99, .99, .99, and .92; non-normed fit index, .98, .99, .99, .92; comparative fit index, .99, .99, .99, .94, and root mean square error of approximation, .07, .06, .09, .04, (Steinberg & Monahan).

Monahan and Piquero (2009) used a confirmatory factor analysis to test the factor structure of the RPI. Their findings supported the adequate fit of the subscales measuring RPI, including: normed fit index (NFI; .92); nonnormed fit index (NNFI; .92); comparative fit index (CFI; .94); and root mean square error of approximation (RMSEA; .04).

Monahan, Steinberg, and Cauffman (2009) completed a confirmatory factor analysis to support the construct validity of the RPI. The researchers found adequate fit of the scale to the data (comparative fit index, CFI = .94), and root mean square error of approximation, RMSEA = .04).

Sumter et al. (2009) used a principal components factor analysis on the RPI. Their results confirmed that the 10 items loaded on a single factor. Their results were similar to those obtained by Steinberg and Monahan (2007).

Difficulty with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a comprehensive measure of difficulties in emotion regulation within the following dimensions: (a) awareness and understanding of emotions; (b) acceptance of emotions; (c) the ability to engage in goal-directed behavior, and refrain from impulsive behavior, when experiencing negative emotions; and (d) access to emotion regulation strategies perceived as effective. The DERS distinguishes between adaptive emotion regulation and emotional avoidance and control of expression (Gratz & Roemer, 2004). The DERS is a 36-item self-report measure with 6 subscales: (a) Nonacceptance; nonacceptance of emotional responses; (b) Goals; difficulties engaging in goal-directed behaviors when distressed; (c) Impulse; difficulties controlling impulsive behaviors when distressed; (d) Awareness; lack of emotional awareness; (e) Strategies; limited access to emotion regulation strategies perceived as effective; and (f) Clarity; lack of emotional clarity (Gratz & Tull, (2010).

The DERS provides a total score (from 36 to 180) that represents overall difficulties in emotion regulation. Scoring is done on a 5-point Likert scale where 1 is “almost never” and 5 is “almost always”. Higher overall score and subscale scores represent greater difficulties with emotion regulation (Gratz & Tull, 2010). For the purpose of this study, only the overall score was used.

Both the overall score and the subscale scores have been found to have high internal consistency with Cronbach’s alpha = .93 for the total score (Gratz & Roemer, 2004). The subscales (computed from the six factors obtained in the factor analysis) had adequate internal consistency with Cronbach’s alphas greater than .80 for each subscale. The DERS has shown good test-retest reliability over a period of 4 to 8 weeks ($r = .88$, $p < .01$). The test-retest reliability of the six subscales was adequate (for the nonacceptance of emotional responses

subscale [r = .69]; goal directed behavior when distressed subscale [r = .69]; impulse control difficulties [r = .57]; lack of emotional awareness [r = .68]; lack of effective emotion regulation strategies [r = .89]; and lack of emotional awareness/clarity [r = .80]; the test-retest correlation for all subscales was statistically significant [p < .01] (Gratz & Roemer).

In a sample of 77 University of Massachusetts Boston undergraduate students 18 to 50 years of age who experienced at least one panic attack in the last year, the DERS showed good internal consistency, alpha = .95 (Tull, 2006). A study of the relation between posttraumatic stress symptoms and difficulties with regulation of emotion, used a sample of 108 undergraduate students in an urban university who were assessed with the DERS (Tull, Barrett, McMillen, & Roemer, 2007). Internal consistency analyses (Cronbach's alphas) for the DERS total score and subscale scores ranged from .79 to .95. Zero-order correlation analysis found significant positive associations between the overall DERS score and five of the subscale scores and posttraumtic stress symptoms. A study by Johnson et al. (2008) found good internal consistency (alpha = .93) among 202 young adults (m = 23.78, sd = 9.69 years). The findings for internal consistency of the DERS using a sample of 189 adults between 18 and 65 years of age indicated adequate reliability (α = .88). Gonzalez, Vujanov, Johnson, Leyro, and Zvolensky (2009) in a study of 174 adults calculated the internal consistency of the DERS as a measure of reliability. The alpha coefficient for the total score was .93, indicating good internal consistency.

Using the responses to the items on the DERS, the internal consistency of the present study was assessed using Cronbach alpha coefficients. The obtained alpha coefficient of .94 for the present sample was similar to those reported in earlier studies.

Construct validity was examined by Gratz and Roemer (2004). Correlations were computed for the DERS total score and subscales scores with a commonly used measure of emotion regulation, the Generalized Expectancy for Negative Mood Regulation Scale (NMR;

Catanzaro & Mearns, 1990) and with a measure of experiential avoidance, the Acceptance and Action Questionnaire (AAQ; Hayes, Wilson, Gifford, Follett & Strosahl, 1996) and with a measure of emotional expressivity, the Emotion Expressivity Scale, (EES; Kring, Smith, & Neale, 1994). The overall DERS score showed a significant correlation with the three instruments (Gratz & Roemer). In a sample of 357 undergraduate psychology students at the University of Massachusetts Boston, Gratz and Roemer (2004) found that the DERS total score significantly predicted frequency of partner abuse among men (Gratz & Roemer). In Tull's (2006) study, the DERS total score significantly predicted panic symptom severity above and beyond stress and anxiety sensitivity.

In a study of 36 out-patient psychiatric patients, Gratz, Rosenthal, Tull, Lejuez, & Gunderson (2006) found a statistically significant negative correlation (r = -.63) between the DERS total score and an experimental measure of emotion regulation. This significant relation was in the anticipated direction, indicating good criterion validity.

Self-Efficacy to Resist Risk Taking Behaviors

The Self-efficacy to Resist Risk Taking Behaviors Inventory (SERRTBI) is a 10-item, researcher-developed instrument to measure self efficacy to resist peer influence to engage in risk taking behaviors. This instrument examines the strength of individuals' beliefs in their ability or their perceived capability to resist the influence of peers to engage in risk taking behaviors associated with alcohol, drugs, and sex. The participants were asked to rate the degree of confidence they have in their ability to resist peer influence. The scale is scored on a 5 point Likert scale with 1 indicating "cannot do at all", 3 indicating "moderately can do", and 5 "highly certain can do."

The scores are summed and divided by the total number of items on the scale. Higher scores indicate individuals' greater confidence in their ability to resist peer influence to engage in risk taking behaviors.

The SERRTBI had not been tested for reliability prior to conducting the study. Using the responses from the present sample, a Cronbach alpha coefficient was used to determine the internal consistency of the instrument. The obtained alpha coefficient of .90 provided support that the SERRTBI had good internal consistency as a measure of reliability.

Face validity was determined by having three psychologists review the scale. They were asked to read the items and indicate their appropriateness for measuring self-efficacy to resist peer influence. They indicated that the instrument was usable as written and provided no additional suggestions regarding wording changes.

Demographic Survey

A short demographic survey was developed by the researcher to obtain information on the personal and educational characteristics of the undergraduate, college student participants. The included items were age, gender, ethnicity, relationship status, living arrangement, year in college, and major. The items on this instrument used a combination of forced-choice categories and fill-in-the-blank responses.

Pilot Study

A pilot study with 19 college students was completed to determine the variability of the five instruments, the Cognitive Appraisal of Risky Events-Revised (CARE-R, Fromme, D'Amico, & Katz, 1999; Katz, Fromme, & D'Amico, 2000), the Sensation Seeking Scale – V, (SSS-V ; Zuckerman et al., 1978), Resistance to Peer Influence (RPI; Steinberg& Monahan, 2007), Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), and Self-Efficacy to Resist Risky Behaviors Inventory (SERRBI); a researcher-developed measure), as

well as a demographic survey. Cronbach alpha coefficients were obtained for each of the instruments to determine the internal consistency as a measure of reliability with this emerging adult group.

The students ranged in age from 18 to 22, with the largest group of participants (n = 9, 47.4%) reporting their ages as 18. Ten (52.6%) male and 9 (47.4%) female students participated in the study. The majority of the participants (n = 14, 73.7%) reported their ethnicity as Caucasian, with 3 (15.8%) indicating their ethnicity as African American. Most of the students (n = 14, 73.7%) were single, with 5 (26.3%) reporting they were in committed relationships. All four years of college were represented, with 8 (42.1%) freshmen, 4 (21.1%) sophomores, 5 (26.3%) juniors, and 2 (10.5%) seniors participating in the study. Seven (36.8%) students reported that they were living on campus in dorms, and two groups of 6 (31.6%) indicated living at home with parents or living independently off campus.

CARE-R (Self-Report). The students generally rated their risky sexual behaviors (M = 1.54, SD = 1.69), which would indicate they participated in these types of behaviors from 1 to 2-4 times in the last six months. The female risky sexual behaviors had a mean score of .88 (SD = 1.51), while male risky sexual behaviors was higher with a mean of 1.36 (SD = 2.04). The students reported their risky drug use as 1.01 (SD = 1.59), with higher mean scores obtained for risky alcohol use (M = 2.46, SD = 1.71). The possible range of mean scores for these types of behaviors was from 0 to 6, with higher mean scores indicating greater participation in these types of risky sexual and substance use behaviors.

CARE-R (Perceptions of Peer Behavior). As found in prior studies, the students reported their perceptions of their peers' risky behaviors higher than their self-reported behaviors for all three measures. The mean score for their perceptions of their peers' risky sexual behaviors was 2.49 (SD = 1.83), with female-specific risky sexual behaviors (M = 2.10, SD = 1.91) and

male-specific risky sexual behaviors (M = 2.30, SD = 2.19). These mean scores were higher than self-reports of the same behaviors. The emerging adults had higher perceptions of their peers' risk behaviors regarding drug use (M = 2.01, SD = 1.92) and alcohol use (M = 3.12, SD = 1.68) compared to their self-reported risk behaviors in these areas. Possible mean scores could range from 1 to 6, with higher mean scores indicating higher perceptions of their peers' risky behaviors.

Sensation Seeking Scale – V. The 40 items on the scale had two possible responses, with one response indicating a sensation-seeking behavior and the other item reflecting nonsensation-seeking behavior. The responses indicating sensation-seeking behaviors were counted to obtain a total score. The mean score for SSS-V was 19.63 (SD = 6.09), indicating a moderate level of sensation seeking. Actual scores on this scale ranged from 9 to 29. Possible scores could range from 1 to 40, with higher scores indicating greater sensation seeking behavior.

Resistance to Peer Influence. The 10 items on this scale measure emerging adults' general ability to resist peer influence. The mean score for this scale was 2.85 (SD = .54), indicating the students were somewhat able to resist peer influence. Possible mean scores on this scale could range from 1 to 4, with higher mean scores indicating greater ability to resist peer influence.

Difficulties in Emotion Regulation Scale (DERS). This scale uses 36 items to measure emerging adults' ability to regulate their emotions. The mean score for this scale was 2.26 (SD = .57), which indicated the students were somewhat able to regulate their emotions. Possible mean scores could range from 1 to 5, with higher mean scores indicating greater difficulty with emotion regulation.

Self-efficacy to Resist Risky Behavior. Ten items were included on this original self-efficacy scale to resist peer influence. The mean score for this scale was 3.78 (SD = 1.06),

indicating the students were reasonably certain that they had the self-efficacy to resist peer influence. The range of possible mean scores was from 1 to 5, with higher mean scores indicating greater self-efficacy to resist peer influence.

Reliability. Cronbach alpha coefficients were obtained for each of the scales to determine the internal consistency as a measure of reliability. Table 6 presents the alpha coefficients for each of the six scales obtained for the pilot study as well as the full study.

Table 6

Cronbach Alpha Coefficients

Scale	α Coefficient – Pilot Study	α Coefficient – Full Study
CARE-R (Self-Report)		
Risky sexual behaviors	.92	.83
Risky drug use	.93	.58
Risky alcohol use	.95	.88
CARE-R (Perceptions of peer behavior)		
Risky sexual behaviors	.96	.96
Risky drug use	.90	.84
Risky alcohol use	.95	.93
Sensation Seeking Scale – V	.75	.81
Resistance to Peer Influence	.78	.78
Difficulties in Emotion Regulation Scale (DERS)	.89	.94
Self-efficacy to Resist Peer Influence	.91	.90

The alpha coefficients obtained for each of the scales for the pilot study ranged from .75 to .98, indicating adequate to good internal consistency as a measure of reliability. The alpha coefficients for the full study were similar, ranging from .58 to .96, providing additional support for the internal consistency of the instruments for use with the emerging adult participants.

Procedure

After receiving approval from the Human Investigation Committee (HIC), the researcher contacted professors teaching undergraduate classes in literature, science, and the arts to obtain permission to ask their students to participate in the study. The researcher developed survey packets for distribution to the students in the classes. The survey packets included the research information sheet and copies of the six surveys, counterbalanced to minimize order effects. The research information sheet followed the HIC template. The use of the research information sheet provided assurances of anonymity as the participants did not have to sign and return an informed consent form that discloses the names of the participants.

The researcher entered the professors' classrooms at the professors' convenience on a prearranged date and time. She discussed the purpose and importance of the study with the students. She distributed survey packets with a research information sheet to students who showed an interest in participating in the study. The research information sheet explained the purpose of the study, how the results would be used to improve student life, risks and benefits to the potential participants, requirements to participate in the study, approximate time needed to complete the surveys, instructions to complete the surveys, and that the study is entirely voluntary with no effect on the students' grade in the course whether or not they volunteer to participate. The researcher explained that a time commitment of 20 to 30 minutes would be needed to complete the surveys. The researcher also orally described and discussed with the students all of the information on the information sheet that they had in front of them to read. The researcher, a master's level psychologist, answered all questions and concerns either during the presentation or individually after the presentation.

Participants were asked to complete the self-report questionnaires and return them in the original envelope to the researcher in their class one week later. They were asked to seal or tape the envelopes to protect their anonymity further.

The researcher returned to the classrooms to collect the participants' questionnaires one week later. Students who had forgotten or misplaced their survey packet were able to return them in another week to the researcher during the same class. In the event that a participant had lost the packet, another packet was given if the participant wanted to be included in the study. The return of the survey packet was considered the volunteers' willful assent to participate in the study.

In regard to anonymity, the researcher had no contact with the students prior to the distribution of the survey packets. The researcher instructed the participants not to write their name anywhere on either the information sheet or the surveys. Nowhere on the information sheet or the surveys was there a place for the students to write their name or any other identifying information and no identifying coding was placed on the information sheet or on the surveys, further insuring anonymity of the participants. The researcher told the participants that only group results would be reported. Upon return of the surveys, the researcher gave each participant a $5.00 gift card for Starbucks.

Data Analysis

The data collected from the surveys were entered into a computer file for analysis using PASW (latest version). The data analyses were divided into three sections. The first section used frequency distributions, measures of central tendency and dispersion, and crosstabulations to provide a profile of the participants' personal and educational demographic characteristics. The second section of the data analysis used descriptive statistics to provide baseline statistics on the scaled variables. Multivariate analysis of variance (MANOVA) and t-tests for two independent

samples were used to test the dependent variables between male and female participants. If male and female emerging adults differed on these variables, the research questions were tested controlling for gender. Inferential statistical analyses, including multiple linear regression analysis and mediation analysis were used in the third section of the data analysis to test each of the hypotheses and address the research questions. All decisions on the statistical significance of the findings were made using a criterion alpha level of .05. The data analysis that was used to test the hypotheses are presented in Table 7.

Table 7

Statistical Analysis

Research Questions/Hypotheses	Variables	Statistical Analysis
Preliminary Analyses: Analysis of variance procedures were run on all continuous variables by gender. If statistically significant gender differences emerge, subsequent analyses controlled for gender and age.		
1. (a) What is the combined strength of sensation seeking, perceived peer risk taking behavior, emotion regulation, general resistance to peer influence, and self-efficacy to resist risky behavior in explaining the variance in risk taking behavior in regard to alcohol use, drug use, and sexual activities? (b) What is the relative contribution of each variable – are some stronger predictors than others?		
H_{1a}: The combination of these predictor variables will explain a significant proportion of variance in each of the criterion variables. H_{1b}: Perceived peer risk taking behavior is expected to be the strongest predictor, followed by sensation seeking.	<u>Criterion Variables</u> • Self-report alcohol use • Self-report drug use • Self-report sexual activities <u>Predictor Variables</u> • Sensation seeking • Perceived peer risk taking behavior • Emotion regulation • General resistance to peer influence • Self-efficacy to resist risky behavior	Three separate multiple linear regression analyses were used to determine which of the predictor variables are statistically significant predictors of the criterion variables.
2. Does emotion regulation mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?		
H_2: The relation between sensation seeking, perceived peer risk taking behavior, and actual risk taking behavior is mediated by emotion regulation.	<u>Criterion Variables</u> Risk taking behavior – Alcohol Risk taking behavior – Drug Use Risk taking behavior – Sexual activities <u>Predictor Variables</u>	Three separate mediation analyses were conducted using the Baron and Kenny four step analysis to determine if emotion regulation is mediating the relation between risk taking behaviors and sensation seeking and perceived peer risk

Research Questions/Hypotheses	Variables	Statistical Analysis
	Sensation seeking Perceived peer risk taking behavior <u>Mediating Variable</u> Emotion regulation	taking behaviors.
3. Does general resistance to peer influence mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?		
H_3: The relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior can be mediated by general resistance to peer influence.	<u>Criterion Variables</u> Risk taking behavior – Alcohol Risk taking behavior – Drug Use Risk taking behavior – Sexual activities <u>Predictor Variables</u> Sensation seeking Perceived peer risk taking behavior <u>Mediating Variable</u> general resistance to peer influence	Mediation analyses were used to determine if general resistance to peer influence was mediating the relation between risk taking behaviors and sensation seeking and perceived peer risk taking behaviors.
4. Does self-efficacy to resist risky behavior mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?		
H_4: The relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior can be mediated by self-efficacy to resist risky behavior.	<u>Criterion Variables</u> Risk taking behavior – Alcohol Risk taking behavior – Drug Use Risk taking behavior – Sexual activities <u>Predictor Variables</u> Sensation seeking Perceived peer risk taking behavior <u>Mediating Variable</u> Self-efficacy to resist risky behavior	Mediation analysis was used to determine if self-efficacy to resist risky behavior was mediating the relation between risk taking behaviors and sensation seeking and perceived peer risk taking behaviors.

CHAPTER 4

RESULTS

Introduction

The purpose of this study was to examine the relation between emerging adult college students' risk taking behavior (alcohol, drugs, sex) and intrapersonal factors unique to the individual, specifically sensation seeking, perceived peer risk taking behavior, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior.

Means and standard deviations for all continuous variables are included in Table 8. The mean scores for frequency of involvement in risky sex, drugs, and alcohol behaviors were low when compared to the possible range of scores. Similar results were obtained for perceived peer involvement in these risky behaviors. Many students reported no involvement in their self-reported risky sex (n = 116, 27.4%), drugs (n = 269, 63.9%), and alcohol (n = 131, 31.0%) behaviors. As a result, the means scores are somewhat low in relation to the possible range of scores. (See Table 8).

Table 8

Descriptive Statistics – Scaled Variables (N = 423)

				Actual Range		Possible Range	
Scale	*N*	*M*	*SD*	Minimum	Maximum	Minimum	Maximum
CARE-R – Frequency of Self Involvement							
Risky Sex	422	1.61	.69	1.00	5.67	1.00	7.00
Risky Drugs	420	1.31	.62	1.00	5.60	1.00	7.00
Risky Alcohol	421	1.80	.98	1.00	6.38	1.00	7.00
CARE-R – Perceptions of Peer Involvement							
Risky Sex	405	2.57	1.22	1.00	6.33	1.00	7.00
Risky Drugs	398	1.94	1.14	1.00	7.00	1.00	7.00
Risky Alcohol	397	2.79	1.49	1.00	7.00	1.00	7.00
Resistance to Peer Influence	385	3.05	.49	1.40	4.00	1.00	4.00
Sensation Seeking – V	422	17.17	6.48	0.00	35.00	0.00	40.00
Emotion Regulation	421	2.29	.63	1.00	4.59	1.00	5.00
Self-efficacy to Resist Risk taking Behaviors	418	4.17	.94	1.00	5.00	1.00	5.00

Intercorrelations

Pearson product moment correlations were used to determine the correlations among the scaled variables (See Table 9).

Table 9

Pearson Product Moment Correlations – Scaled Variables (N = 423)

	Variables									
	1	2	3	4	5	6	7	8	9	10
1										
2	.45**									
3	.49**	.53**								
4	.41**	.29**	.31**							
5	.24**	.35**	.24**	.60**						
6	.30**	.34**	.48**	.71**	.72**					
7	.15**	-.05	-.10	.08	.01	-.03				
8	.31**	.39**	.44**	.22**	.19**	.30**	-.10*			
9	-.01	.06	.05	.04	.06	.08	-.45**	.03		
10	-.33**	-.46**	-.51**	-.23**	-.19**	-.32**	-.20**	-.47**	-.11*	

*$p \leq .05$; **$p \leq .01$

Variables: 1 Risky Sex – Self; 2 Risky Drugs – Self; 3 Risky Alcohol – Self; 4 Risky Sex – Peers; 5 Risky Drugs – Peers; 6 Risky Alcohol – Peers; 7 Resistance to Peer Influence; 8 Sensation Seeking; 9 Difficulty in Emotion Regulation; 10 Self-efficacy to Resist Risky Behavior

The intercorrelational matrix provided an indication that the variables generally were correlated. With the exception of resistance to peer influence which was correlated only with risky sex – self ($r = .15$, $p < .001$) and emotion regulation which was correlated only with resistance to peer influence ($r = -.45$, $p < .001$) the remaining variables were correlated significantly in the anticipated directions. Students who had had greater frequency of risky sex behaviors were more likely to have lower levels of resistance to peer influence (higher scores on this scale indicate that students are less likely to resist peer influence). The negative relationship between emotion regulation and resistance to peer influence provided support that students who were less likely to resist peer influence also tended to have poorer emotion regulation. The scale measuring self-efficacy to resist risky behavior was significantly correlated with all of the other variables in a negative direction. These results indicated that students who were more likely to

have higher levels of self-efficacy to resist risky behaviors were less likely to exhibit risky behaviors for sex, alcohol, and drugs and to be sensation seekers. They were more likely to have greater ability to resist peer influence and to have better emotion regulation.

Gender Differences

The scaled variables were compared by gender to determine if male and female students responded differently to the scales. The three subscales measuring frequency of involvement in risky sex, drugs, and alcohol were used as the dependent variables in a one-way multivariate analysis of variance (MANOVA). The gender of the student was used as the independent variable. (See Table 10).

Table 10

Multivariate Analysis of Variance – Frequency of Involvement in Risky Behaviors by Gender (N = 423)

Hotelling's Trace	*F* Ratio	*DF*	Sig	Effect Size
.02	3.05	3, 416	.029	.02

The results of the comparison of frequency of involvement in risky behaviors by gender produced statistically significant results, F (3, 416) = 3.05, p = .029, d = .02. Based on this finding, the three types of risky behaviors, sex, drugs, and alcohol, were differing between the male and female students. To determine which of the behaviors was contributing to the statistically significant result, the between subjects effects were examined. (See Table 11.)

Table 11

Between Subject Effects – Frequency of Involvement in Risky Behaviors by Gender (N = 423)

Source	Sum of Squares	*DF*	Mean Square	*F* Ratio	Sig	Effect Size
Sex	.25	1, 418	.25	.52	.470	.01
Drugs	1.54	1, 418	1.54	3.97	.047	.01
Alcohol	7.50	1, 418	7.50	7.95	.005	.02

Two subscales, drugs and alcohol, measuring frequency of involvement in risky behaviors, differed significantly between the male and female students. The comparison of drugs by gender was statistically significant, F (1, 418) = 3.97, p = .047, d = .01. The results of the analysis comparing frequency of risky alcohol behaviors by gender were statistically significant, F (1, 418) = 795, p = .005, d = .02. The effect sizes of .01 and .02, respectively, for these analyses were low, indicating that although the results were statistically significant, they had little practical significance. To determine which gender was contributing to the statistically significant results, descriptive statistics were obtained for each of the subscales. (See Table 12).

Table 12

Descriptive Statistics - Frequency of Involvement in Risky Behaviors by Gender (N = 423)

	Gender					
	Male			Female		
Subscale	*N*	*M*	*SD*	*N*	*M*	*SD*
Sex	150	1.64	.80	270	1.59	.62
Drugs	150	1.39	.69	270	1.27	.58
Alcohol	150	1.99	1.11	270	1.71	.88

When the mean scores for risky behaviors involving drugs were compared, males (M = 1.39, SD = .69) had higher frequency than females (M = 1.27, SD = .58). The mean scores for

frequency of involvement in risky alcohol for males (M = 1.99, SD = 1.11) were significantly higher than the mean scores for females (M = 1.71, SD = .88). The difference in the mean scores for the frequency of involvement in risky sex was not statistically significant.

The male and female students' mean responses for perceptions of their peers' involvement in risky behaviors (sex, drugs, and alcohol) were used as the dependent variables in a one-way MANOVA. Gender of the participants was used as the independent variable in this analysis. (See Table 13).

Table 13

Multivariate Analysis of Variance – Perceptions of Peer Involvement in Risky Behaviors by Gender (N = 423)

Hotelling's Trace	*F* Ratio	*DF*	Sig	Effect Size
.02	3.00	3, 392	.031	.02

The results of the one-way MANOVA used to compare perceptions of peer involvement in risky behaviors were statistically significant, F (3, 392) = 3.00, p = .031, d = .02. This result indicated that the difference in the male and female participants' mean scores for perceptions of peer involvement was significant. To determine which of the three types of risky behaviors (sex, drugs, and alcohol) was contributing to the statistically significant result, the between subjects effects were examined. (See Table 14).

Table 14

Between Subject Effects – Perceptions of Peer Involvement in Risky Behaviors by Gender (N = 423)

Source	Sum of Squares	*DF*	Mean Square	*F* Ratio	Sig	Effect Size
Sex	.01	1, 394	.01	.01	.921	<.01
Drugs	.07	1, 394	.07	.06	.814	<.01
Alcohol	7.38	1, 394	7.38	3.39	.067	.01

When the between subjects effects were tested, no statistically significant differences emerged. To further examine the lack of statistically significant results, descriptive statistics were obtained. (See Table 15).

Table 15

Descriptive Statistics – Perceptions of Peer Involvement in Risky Behaviors by Gender (N = 423)

	Gender					
	Male			Female		
Subscale	*N*	*M*	*SD*	*N*	*M*	*SD*
Sex	142	2.56	1.24	254	2.58	1.20
Drugs	142	1.96	1.05	254	1.93	1.19
Alcohol	142	2.96	1.49	254	2.68	1.47

An examination of the mean scores supported the lack of statistically significant differences in the mean scores for the male and female students on perceptions of their peers' involvement in risky behaviors.

The remaining variables, sensation seeking, resistance to peer influence, emotion regulation, and self-efficacy to resist risky behaviors, were used as the dependent variables in separate t-tests for two independent samples. The independent variable in these analyses was gender. (See Table 16).

Table 16

t-Tests for Two Independent Samples – Sensation Seeking, Resistance to Peer Influence, Emotion Regulation, and Self-efficacy to Resist Risky Behaviors by Gender

Variables	*N*	*M*	*SD*	*DF*	*t*-Value	Sig
Sensation Seeking						
Male	151	19.52	5.95	420	5.78	<.001
Female	271	15.86	6.40			
Resistance to Peer Influence						
Male	138	2.96	.52	383	-2.66	.008
Female	247	3.09	.47			
Emotion Regulation						
Male	151	2.25	.58	419	-1.02	.307
Female	270	2.31	.65			
Self-efficacy to Resist Risky Behaviors						
Male	151	3.93	.98	416	-3.98	<.001
Female	267	4.31	.89			

The comparison of the male and female scores on the four variables produced three statistically significant results. The *t*-value for sensation seeking was statistically significant, t (420) = 5.78, p <.001, with male students (M = 19.52, SD = 5.95) having higher scores than female students (M = 15.86, SD = 6.40). When the mean scores for resistance to peer influence were compared, the result was statistically significant, t (383) = -2.66, p = .008) with female students (M = 3.09, SD = .47) having higher scores than male students (M = 2.96, SD = .52). The comparison of the mean scores for male (M = 3.93, SD = .98) and female (M = 4.31, SD = .89) on self-efficacy to resist risky behaviors was statistically significant, t (416) = -3.98, p < .001. The difference between male (M = 2.25, SD = .58) and female (M = 2.31, SD = .65) students' scores for emotion regulation was not statistically significant, t (419) = -1.02, p = .307.

As a result of the statistically significant findings on the analyses comparing the scores on each of the variables used in the study, gender was used as a covariate in the subsequent regression analyses used to test the first hypothesis.

Research Questions and Hypotheses

Four research questions and associated hypotheses were developed for the study. Each of these questions was addressed using inferential statistical analyses, with all decisions on the statistical significance of the findings made using a criterion alpha level of .05.

Research question 1: (a) What is the combined strength of sensation seeking, perceived peer risk taking behavior, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior in explaining the variance in risk taking behavior in regard to alcohol use, drug use, and sexual activities?

(b) What is the relative contribution of each variable – are some stronger predictors than others?

H_{1a}: The combination of these predictor variables will explain a significant proportion of variance in each of the criterion variables.

The three variables measuring frequency of involvement in risky behaviors (sex, drugs, and alcohol) were used as criterion variables in three separate stepwise multiple linear regression analyses. The predictor variables in these analyses included sensation seeking, perceived peer risk taking behaviors (sex, drugs, and alcohol), general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behaviors. Gender and age of the participants were used as covariates in each of these analyses. On the first step of the analysis, the covariates were entered simultaneously. On the next step, SPSS analyzes each of the predictor variables to determine which predictor is accounting for the greatest amount of variance in the criterion variable. That predictor variable is then entered into the stepwise multiple linear regression equation. On the subsequent steps, the predictor variables are analyzed to determine which is explaining the next greatest amount of variance in the criterion variable. This process continues until the criteria for inclusion (the p value) is reached. The remaining predictor variables are then

excluded from the regression equation, as they are not predicting a statistically significant amount of variance in the criterion variable. (See Table 17.)

Table 17

Stepwise Multiple Linear Regression Analysis – Frequency of Involvement in Risky Sex Behaviors

Predictor Variables	Constant	*b*-Weight	ß-Weight	r^2	*t*-Value	Sig
Included Variables						
Age of student	.13	06	.16	.04	3.80	<.001
Gender		.07	.05	<.01	1.12	.263
Risky sex peers		.18	.31	.15	7.01	<.001
Self-efficacy to resist risky behaviors		-.14	-.19	.06	-4.03	<.001
Sensation Seeking		.02	.15	.02	3.13	.002
Excluded Variables						
Risky drugs peers			-.02		-.35	.726
Risky alcohol peers			-.06		-1.03	.305
Resistance to peer influence			.07		1.53	.128
Emotion regulation			-.02		-.57	.572

Multiple R	.51
Multiple R^2	.27
F Ratio	29.96
DF	5, 417
Sig of F	<.001

Three variables, perceived peer involvement in risky sex (r^2 = .15), self-efficacy to resist risky behaviors (r^2 = .06), and sensation seeking (r^2 = .02) entered the stepwise multiple linear regression analysis, accounting for 23% of the variance in the criterion variable, frequency of involvement in risky sex behaviors, F (5, 417) = 29.96, p < .001. The age of the student and gender were entered first as covariates and accounted for 4% of the variance in the criterion variable. Age was a statistically significant covariate (ß = .16, t = 3.80, p < .001), while gender was not statistically significant ß = .05, t = 1.12, p = .263. Perceived peer involvement in risky sex behaviors entered the stepwise multiple linear regression equation first, accounting for 15%

of the variance in frequency of involvement in risky sex behaviors, ß = .31, t = 7.01, p < .001. Six percent of the variance in frequency of involvement in risky sex behaviors was explained by self-efficacy to resist risky behaviors, ß = -.19, t = -4.03, p < .001. The negative direction of the relation between the criterion variable and self-efficacy to resist risky behaviors indicated that students who had lower scores for frequency of involvement in risky sex behaviors were more likely to have higher levels of self-efficacy to resist risky behaviors. Sensation seeking entered the stepwise multiple linear regression equation, accounting for 2% of the variance in frequency of involvement in risky sex behaviors, ß = .15, t = 3.13, p = .002. The remaining predictor variables, perceived peer involvement in risky drugs behaviors, perceived peer involvement in risky alcohol behaviors, general resistance to peer influence, and emotion regulation, did not enter the stepwise multiple linear regression equation, indicating they were not statistically significant predictors of frequency of involvement in risky sex behaviors.

A second stepwise multiple linear regression analysis was used to determine which of the predictor variables could be used to predict frequency of involvement in risky drug behaviors. (See Table 18).

Table 18

Stepwise Multiple Linear Regression Analysis – Frequency of Involvement in Risky Drug Behaviors

Predictor Variables	Constant	*b*-Weight	ß-Weight	r^2	*t*-Value	Sig
Included Variables						
Age of student	1.08	.03	.08	.01	1.83	.068
Gender		.03	.02	.01	.53	.594
Self-efficacy to resist risky behaviors		-.22	-.33	.20	-7.03	<.001
Risky drug peers		.14	.24	.07	5.81	<.001
Sensation Seeking		.02	.19	.03	3.95	<.001
Excluded Variables						
Risky sex peers			.04		.67	.503
Risky alcohol peers			-.01		-.05	.959
Resistance to peer influence			.02		.50	.616
Emotion regulation			.01		.30	.765

Multiple R	.56
Multiple R^2	.32
F Ratio	37.47
DF	5, 417
Sig of F	<.001

In Table 18, three predictor variables, self-efficacy to resist risky behaviors (r^2 = .20), perceived peer involvement in risky drug behaviors (r^2 = .07), and sensation seeking (r^2= .03), entered the stepwise multiple linear regression equation, accounting for 30% of the variance in the criterion variable, frequency of involvement in risky drug behaviors, F (5, 417) = 37.47, p < .001 above and beyond age and gender, which were entered as covariates. Age and gender of the participants were entered as covariates in the stepwise multiple linear regression equation. Together, they explained 2% of the variance in frequency of involvement in risky drug behaviors and were not statistically significant predictors of the criterion variable. Self-efficacy to resist risky behaviors entered the stepwise multiple linear regression equation first, explaining 20% of the variance in frequency of involvement in risky drug behaviors, ß = -.33, t = -7.03, p < .001. The negative relation between the two variables indicated that students who have higher levels of

self-efficacy to resist risky behaviors were more likely to have lower scores for frequency of involvement in risky drug behaviors. Perceived peer involvement in risky drug behaviors entered the stepwise multiple linear regression equation, accounting for 7% of the variance in frequency of involvement in risky drug behavior, $ß = .24$, $t = 5.81$, $p < .001$. Three percent of the variance in frequency of involvement in risky drug behavior was explained by sensation seeking, $ß = .19$, $t = 3.95$, $p < .001$. The remaining predictor variables, perceived peer involvement in risky sex behaviors, perceived peer involvement in risky alcohol behaviors, resistance to peer influence, and emotion regulation, did not enter the stepwise multiple linear regression equation, indicating they were not statistically significant predictors of the criterion variable.

A third stepwise multiple linear regression analysis was used to determine which predictor variables were predicting the criterion variable, frequency of involvement in risky alcohol behaviors.The same set of predictor variables (sensation seeking, perceived peer risk taking behaviors [sex, drugs, and alcohol], general resistance to peer influence, emotion-regulation, and self-efficacy to resist risky behaviors), were used in these analyses with gender and age of the student used as covariates.

(See Table 19).

Table 19

Stepwise Multiple Linear Regression Analysis – Frequency of Involvement in Risky Alcohol Behaviors

Predictor Variables	Constant	*b*-Weight	ß-Weight	r^2	*t*-Value	Sig
Included Variables						
Age of student	.46	08	.15	.04	3.99	<.001
Gender		.04	.02	.02	.54	.592
Self-efficacy to resist risky behaviors		-.33	-.31	.24	-7.28	<.001
Risky alcohol peers		.29	.42	.10	7.52	<.001
Sensation seeking		.03	.20	.03	4.64	<.001
Risky drugs peers		-.15	-.17	.01	-3.19	.002
Excluded Variables						
Risky sex peers			-.03		-.53	.597
Resistance to peer influence			-.03		-.71	.472
Emotion regulation			.01		.24	.813

Multiple R	.66
Multiple R^2	.44
F Ratio	52.11
DF	6, 416
Sig of F	<.001

Four of the predictor variables, self-efficacy to resist risky behaviors (r^2 = 24), perceived peer involvement in risky alcohol behaviors (r^2 = .10), sensation seeking (r^2 = .03) and perceived peer involvement in risky drug behaviors (r^2 = .01), entered the stepwise multiple linear regression equation, accounting for 38% of the variance in frequency of involvement in risky alcohol behaviors, F (6, 416) = 52.11, p < .001. The two covariates, age and gender, accounted for 6% of the variance in the criterion variable, frequency of involvement in risky alcohol behaviors. Age was a statistically significant covariate (ß = .04, t = 3.99, p < .001), whereas gender was not a statistically significant covariate ((ß = .02, t = .54, p = .592).

Self-efficacy to resist risky behaviors entered the stepwise multiple linear regression equation first and was the strongest predictor variable, accounting for 24% of the variance in frequency of involvement in risky alcohol behaviors, ß = -.31, t = -7.28, p < .001. The negative

direction of the relation between the predictor and criterion variable indicated that emerging adults who had higher levels of self-efficacy to resist risky behaviors were less likely to be involved in risky alcohol behaviors. Perceived peer involvement in risky alcohol behaviors entered the stepwise multiple linear regression equation, explaining 10% of the variance in frequency of involvement in risky alcohol behaviors, $ß = .42$, $t = 7.52$, $p < .001$. Participants who had higher scores for frequency of involvement in risky alcohol behaviors were more likely to have higher perceived peer involvement in risky alcohol behaviors. Three percent of the variance in the criterion variable was explained by sensation seeking, $ß = .20$, $t = 4.64$, $p < .001$. Table 19 revealed that emerging adults with higher levels of sensation seeking were more likely to be involved in risky alcohol behaviors. Perceived peer involvement in risky drug behaviors entered the stepwise multiple linear regression equation last, accounting for 1% of the variance in the criterion variable, $ß = -.17$, $t = -3.19$, $p = .002$. Students who had higher scores for frequency of involvement in risky alcohol behaviors were more likely to have lower scores for perceived peer involvement in risky drug behaviors.

The remaining predictor variables, perceived peer involvement in risky sex behaviors, resistance to peer influence, and emotion regulation, did not enter the stepwise multiple linear regression equation, indicating they were not statistically significant predictors of frequency of involvement in risky alcohol behaviors. Based on the results of the stepwise multiple linear regression equations, the null hypothesis that the combination of predictor variables will not explain a statistically significant proportion of variance in each of the criterion variables is rejected.

H_{1b}: Perceived peer involvement in risk taking behavior is expected to be the strongest predictor, followed by sensation seeking.

The results of the three stepwise multiple linear regression equations were examined to determine the strongest predictor variables for frequency of involvement in risky sex behaviors. Perceived peer involvement in risky sex behaviors was the strongest predictor, followed by self-efficacy to resist risky behaviors. When frequency of involvement in risky drug behavior was used as a criterion variable, self-efficacy to resist risky behaviors was the strongest predictor and perceived peer involvement in risky drug behavior the second strongest predictor. In regard to the frequency of involvement in risky alcohol behaviors, self-efficacy to resist risky behaviors explained the largest amount of the variance (r^2 = .24). Perceived peer involvement in risky alcohol behaviors had the highest ß-weight (ß = .42), and explained 10% of the variance in frequency of involvement in risky alcohol behaviors.

Sensation seeking was a statistically significant variable in each of the three stepwise multiple linear regression analyses, explaining the variance in frequency of involvement in risky behaviors, including 2% in sex, 3% in drugs, and 3% in alcohol. Based on these findings, it appears that self-efficacy to resist risky behaviors and sensation seeking were consistent predictors of frequency of involvement in risky behaviors. These findings provided support that the null hypothesis should be retained; perceived peer risk taking behavior was not the strongest predictor of frequency of involvement in risky behaviors and sensation seeking was a weak predictor of the criterion variables.

Research question 2. Does emotion regulation mediate the relation between risk taking behavior with sensation seeking and with perceived peer risk taking behavior?

H_{2a}: The relation between sensation seeking and risk taking behavior is mediated by emotion regulation.

The first set of mediation analyses was used to determine if emotion regulation could be used to mediate the relationship between sensation seeking and the three risky behaviors: sex, drugs, and alcohol. For the results of the analysis for risky sex behaviors see Table 20.

Table 20

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Sensation Seeking and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Sex Behaviors	.10	44.24	.31**
Step 2				
Sensation Seeking	Emotion Regulation	.01	.39	.03

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, sensation seeking was accounting for 10% of the variance in risky sex behaviors, F (1, 421) = 44.24, $p < .001$. The relation between sensation seeking and emotion regulation on the second step was not statistically significant, F (1, 421) = .39, p = .534. Because of the nonsignificant findings on the second step of the mediation analysis, the remaining steps were not completed. Based on these findings, it appears that emotion regulation does not mediate the relation between sensation seeking and risky sex behaviors.

The second mediation analysis used risky drug behaviors as the criterion variable, sensation seeking as the predictor variable, and emotion regulation as the mediating variable. (See Table 21).

Table 21

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Sensation Seeking and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Drug Behaviors	.15	72.43	.38**
Step 2				
Sensation Seeking	Emotion Regulation	.01	.39	.03

*$p \leq .05$; **$p \leq .01$

The relation between sensation seeking and risky drug behaviors was tested on the first step of the mediation analysis. This relation was found to be statistically significant, F (1, 421) = 72.43, $p < .001$. On the second step of the analysis, the relation between sensation seeking and emotion regulation was not statistically significant, F (1, 421) = .39, $p = .534$. As a result of the nonsignificant finding on the second step, the mediation analysis could not be continued. Based on these findings, emotion regulation does not appear to be mediating the relation between sensation seeking and risky drug behaviors.

The third mediation analysis used risky alcohol behaviors as the criterion variable, sensation seeking as the predictor variable, and emotion regulation as the mediating variable. (See Table 22).

Table 22

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Sensation Seeking and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Alcohol Behaviors	.19	101.27	.44**
Step 2				
Sensation Seeking	Emotion Regulation	.01	.39	.03

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, the relation between sensation seeking and risky alcohol behavior was statistically significant, F (1, 421) = 101.27, p < .001. When the relationship between emotion regulation and sensation seeking was tested on the second step, the result was not statistically significant, F (1, 421) = .01, p = .534. Based on these findings, emotion regulation did not appear to be a mediator in the relation between risky alcohol behaviors and sensation seeking.

H_{2b}: The relation between perceived peer risk taking behavior and risk taking behavior is mediated by emotion regulation.

The second set of mediation analyses was used to determine if emotion regulation was mediating the relations between risky sex, drugs, and alcohol behaviors and perceived peer involvement in risky sex, drugs, and alcohol behaviors. For the results of the mediation analysis for risky sex behaviors, see Table 23.

Table 23

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Perceived Peer Involvement in Risky Sex Behaviors and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Sex Behaviors	Risky Sex Behaviors	.16	79.16	.40**
Step 2				
Perceived Peer Involvement in Risky Sex Behaviors	Emotion Regulation	>.01	.55	.04

*$p \leq .05$; **$p \leq .01$

The results of the first step of the mediation analysis, the relation between perceived peer involvement in risky sex behaviors and risky sex behaviors was statistically significant, F (1, 421) = 79.16, p < .001. When perceived peer involvement in risky sex behaviors was used as the predictor variable in the second step, with emotion regulation used as the criterion variable, the

result was not statistically significant, F (1, 421) = .55, p = .459. These findings provided support that emotion regulation was not mediating the relation between perceived peer involvement in risky sex behaviors and risky sex behaviors.

The mediation analysis for risky drug behaviors and perceived peer involvement in risky drug behaviors was completed with emotion regulation used as the mediating variable. (See Table 24).

Table 24

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Perceived Peer Involvement in Risky Drug Behaviors and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Drug Behaviors	Risky Drug Behaviors	.11	54.59	.34**
Step 2				
Perceived Peer Involvement in Risky Drug Behaviors	Emotion Regulation	>.01	1.58	.06

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, the relation between risky drug behaviors and perceived peer involvement in risky drug behaviors was statistically significant, F (1, 421) = 54.59, $p < .001$. The second step was used to test the relation between emotion regulation and perceived peer involvement in risky drug behaviors. The result of this analysis was not statistically significant, F (1, 421) = 1.58, p = .210. As a result of the nonsignificant finding on the second step of the mediation analysis, emotion regulation was not mediating the relation between risky drug behaviors and perceived peer involvement in risky drug behaviors.

Risky alcohol behaviors was used as the criterion variable in a mediation analysis, with perceived peer involvement in risky alcohol behaviors used as the predictor variable. The mediating variable in this analysis was emotion regulation. (See Table 25).

Table 25

Mediation Analysis – Mediating Role of Emotion Regulation on the Relation between Perceived Peer Involvement in Risky Alcohol Behaviors and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Alcohol Behaviors	Risky Alcohol Behaviors	.21	113.41	.46**
Step 2				
Perceived Peer Involvement in Risky Alcohol Behaviors	Emotion Regulation	.01	2.28	.07

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, perceived peer involvement in risky alcohol behaviors was found to be a statistically significant predictor of risky alcohol behaviors, F (1, 421) = 113.41, $p < .001$. When perceived peer involvement in risky alcohol behaviors was regressed on emotion regulation on the second step of the mediation analysis, the results were not statistically significant, F (1, 421) = 2.28, $p = .132$. This finding provided support that emotion regulation was not mediating the relation between risky alcohol behaviors and perceived peer involvement in risky alcohol behaviors.

The mediation analyses using emotion regulation as the mediating variable and either sensation seeking or perceived peer involvement in risky behaviors with risky sex, drugs, and alcohol behaviors were not statistically significant. As a result, the null hypothesis of no mediation effect of emotion regulation is retained.

Research question 3. Does general resistance to peer influence mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?

H_{3a}: The relation between sensation seeking and risk taking behavior can be mediated by general resistance to peer influence.

Three mediation analyses used sensation seeking as the predictor variable and risk taking behaviors (sex, drugs, and alcohol) as the criterion variables. The mediating variable in these

analyses was general resistance to peer influence. The analysis for risky sex behaviors is in Table 26.

Table 26

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Sensation Seeking and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Sex Behaviors	.09	44.24	.31**
Step 2				
Sensation Seeking	General Resistance to Peer Influence	.01	4.13	-.10*
Step 3				
General Resistance to Peer Influence	Risky Sex Behaviors	<.01	1.77	.07

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis examined the relation between sensation seeking as the predictor variable and risky sex behaviors as the criterion variable. The results of this analysis were statistically significant, F (1, 421) = 44.24, $p < .001$. The relation between sensation seeking as the predictor variable and general resistance to peer influence on the second step of the analysis was statistically significant, F (1, 421) = 4.13, $p = .043$. On the third step of the analysis, the relation between general resistance to peer influence (predictor variable) and risky sex behaviors (criterion variable) was not statistically significant, F (1, 421) = 1.77, $p = .184$. Because of the nonsignficant findings on the third step of the mediation analysis, the fourth step was not completed. General resistance to peer influence was not mediating the relation between sensation seeking and risky sex behaviors.

The second mediation analysis used sensation seeking as the predictor variable and risky drug behaviors as the criterion variable. General resistance to peer influence was used as the mediating variable in this analysis (see Table 27).

Table 27

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Sensation Seeking and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Drug Behaviors	.15	72.43	.38**
Step 2				
Sensation Seeking	General Resistance to Peer Influence	.01	4.13	-.10*
Step 3				
General Resistance to Peer Influence	Risky Drug Behaviors	<.01	.82	-.04

*$p \leq .05$; **$p \leq .01$

The relation between sensation seeking and risky drug behaviors, examined on the first step of the mediation analysis, was statistically significant, F (1, 421) = 72.43, $p < .001$. On the second step of the analysis, a statistically significant result was obtained for the relation between sensation seeking and general resistance to peer influence, F (1, 421) = 4.13, p = .043. The third step used general resistance to peer influence as the predictor variable and risky drug behaviors as the criterion variable. The results of the analysis were not statistically significant, F (1, 421) = .82, p = .366. Because of the nonsignificant finding on this step, the mediation analysis could not be completed. General resistance to peer influence was not mediating the relation between sensation seeking and risky drug behaviors.

The third mediation analysis was used to determine if general resistance to peer influence was mediating the relation between sensation seeking as the predictor variable and risky alcohol behaviors as the criterion variable (see Table 28).

Table 28

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Sensation Seeking and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Alcohol Behaviors	.19	101.27	.44**
Step 2				
Sensation Seeking	General Resistance to Peer Influence	.01	4.13	-.10*
Step 3				
General Resistance to Peer Influence	Risky Alcohol Behaviors	.01	3.53	-.09

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis examined the relation between sensation seeking and risky alcohol behaviors, F (1, 421) = 101.27, $p < .001$. The relation between sensation seeking and general resistance to peer influence calculated on the second step of the mediation analysis was statistically significant, F (1, 421) = 4.13, p = .043. General resistance to peer influence was used as the predictor variable and risky alcohol behaviors were used as the criterion variable in the third step of the mediation analysis. This relation was not statistically significant, F (1, 421) = 3.53, p = .061, indicating that general resistance to peer influence was not mediating the relation between sensation seeking and risky alcohol behaviors.

The three mediation analyses using general resistance to peer influence as the mediator, sensation seeking as the predictor variable, and risky sex, drugs, and alcohol behaviors as the criterion variables were not statistically significant. Based on these findings, the null hypothesis that general resistance to peer influence was not mediating the relation between sensation seeking and risky behaviors was retained.

H_{3b}: The relation between perceived peer risk taking behaviors and risk taking behaviors can be mediated by general resistance to peer influence.

Three mediation analyses were used to determine if general resistance to peer influence was mediating the relation between perceived peer involvement in risk taking sex, drug, and alcohol behaviors and risk- taking sex, drug, and alcohol behaviors. The first analysis used perceived peer involvement in risky sex behaviors as the predictor variable, risky sex behaviors as the criterion variable, and general resistance to peer influence as the mediating variable. (See Table 29).

Table 29

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Perceived Peer Involvement in Risky Sex Behaviors and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Sex Behavior	Risky Sex Behaviors	.16	79.16	.40**
Step 2				
Perceived Peer Involvement in Risky Sex Behavior	General Resistance to Peer Influence	<.01	2.51	.114

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis used perceived peer involvement in risky sex behaviors as the predictor variable and risky sex behaviors as the criterion variable. The results of this analysis were statistically significant, F (1, 421) = 79.16, $p < .001$. When the relation between perceived peer involvement in risky sex behavior was used as the predictor variable on the second step, with general resistance to peer influence used as the criterion variable, the results were not statistically significant, F (1, 421) = 2.51, p = .114. Because of the nonsignificant finding on the second step of the mediation analysis, general resistance to peer influence did not appear to be mediating the relation between perceived peer involvement in risky sex behavior and risky sex behavior.

The second mediation analysis used perceived peer involvement in risky drug behavior as the predictor variable and risky drug behavior as the criterion variable. The general resistance to peer influence was used as the mediator variable (see Table 30).

Table 30

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Perceived Peer Involvement in Risky Drug Behaviors and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Drug Behavior	Risky Drug Behaviors	.12	54.59	.34**
Step 2				
Perceived Peer Involvement in Risky Drug Behavior	General Resistance to Peer Influence	<.01	<.01	<.01

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, perceived peer involvement in risky drug behavior was accounting for a statistically significant percent of variance in risky drug behaviors, F (1, 420) = 54.59, $p < .001$. The relation between perceived peer involvement in risky drug behavior and general resistance to peer influence was not statistically significant, F (1, 420) < .01, p = .996. Because of the nonsignificant result on the second step of the mediation analysis, the remainder of the mediation analysis could not be completed.

The third mediation analysis used risky alcohol behaviors as the criterion variable and perceived peer involvement in risky alcohol behaviors as the predictor variable. General resistance to peer influence was used as the mediating variable (see Table 31).

Table 31

Mediation Analysis – Mediating Role of General Resistance to Peer Influence on the Relation between Perceived Peer Involvement in Risky Alcohol Behaviors and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Alcohol Behavior	Risky Alcohol Behaviors	.21	113.41	.46**
Step 2				
Perceived Peer Involvement in Risky Alcohol Behavior	General Resistance to Peer Influence	<.01	.43	-.03

*$p \leq .05$; **$p \leq .01$

The relation between perceived peer involvement in risky alcohol behavior and risky alcohol behaviors was tested on the first step of the mediation analysis. A statistically significant amount of variance ($R^2 = .21$) in the criterion variable was explained by the predictor variable, F (1, 418) = 113.41, $p < .001$. On the second step of the mediation analysis, the relation between perceived involvement in risky alcohol behavior and general resistance to peer influence was not statistically significant, F (1, 419) = .43, $p = .514$. As a result of the nonsignificant finding on the second step of the mediation analysis, no further analyses were completed.

The three mediation analyses were used to test the null hypotheses that general resistance to peer influence was not mediating the relation between risky sex, drug, and alcohol behaviors and perceived peer involvement in risky sex, drug, and alcohol behaviors were not statistically significant. Because of these nonsignificant findings, the null hypothesis was retained.

Research question 4. Does self-efficacy to resist risky behavior mediate the relation between sensation seeking, perceived peer risk taking behavior, and risk taking behavior?

H_{4a}: The relation between sensation seeking and risk taking behavior can be mediated by self-efficacy to resist risky behavior.

Three mediation analyses were used to determine if self-efficacy to resist risky behavior could be used to mediate the relations between sensation seeking (predictor variable) and risky

sex, drug, and alcohol behaviors (criterion variables). For results of risky sex behaviors, see Table 32.

Table 32

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Sensation Seeking and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Sex Behaviors	.09	44.24	.31**
Step 2				
Sensation Seeking	Self-efficacy to Resist Risky Behaviors	.22	117.58	-.47**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Sex Behaviors	.11	51.75	-.33**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Sex Behaviors	.11	51.75	-.33**
Sensation Seeking		.03	34.11	.20**
Sobel Test = 6.05, p < .001				

*$p \leq .05$; **$p \leq .01$

On the first step of the mediation analysis, a statistically significant relation was obtained between sensation seeking and risky sex behaviors, F (1, 421) = 44.24, $p < .001$. The relation between self-efficacy to resist risky behaviors and sensation seeking was tested on the second step of the mediation analysis. The results of this analysis were statistically significant, F (1, 421) = 117.56, $p < .001$. The third step tested the relation between the mediating variable, self-efficacy to resist risky behavior and risky sex behavior. This relation was statistically significant, F (1, 421) = 51.75, $p < .001$. Because of the statistically significant findings on the first three steps of the mediation analysis, the fourth step was completed. Holding self-efficacy to resist risky behavior constant, the amount of explained variance between sensation seeking and risky sex behaviors was reduced from .09 on the first step to .03 on the fourth step. Because the

amount of explained variance on the fourth step remained statistically significant, $t = 3.84$, $p < .001$, Sobel's test was used to determine if self-efficacy to resist risky behavior was partially mediating the relation between sensation seeking and risky sex behaviors. The obtained Sobel test statistic of 6.05 was statistically significant, $p < .001$. Based on these findings, it appears that self-efficacy to resist risky behaviors was partially mediating the relation between sensation seeking and risky sex behaviors.

The second mediation analysis used sensation seeking as the predictor variable and risky drug behaviors as the criterion variable. Self-efficacy to resist risky behaviors was used as the mediating variable in these analyses (see Table 33).

Table 33

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Sensation Seeking and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Drug Behaviors	.15	72.43	.38**
Step 2				
Sensation Seeking	Self-efficacy to Resist Risky Behaviors	.22	117.58	-.47**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Drug Behaviors	.21	112.44	-.46**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Drug Behaviors	.21	112.44	-.46**
Sensation Seeking		.04	68.94	.22**
Sobel Test = 7.70, p < .001				

*$p \leq .05$; **$p \leq .01$

The relation between sensation seeking and risky drug behaviors tested on the first step of the mediation analyses was statistically significant, F (1, 421) = 72.43, $p < .001$. The second step of the mediation analysis tested the relation between sensation seeking and self-efficacy to resist

risky behavior. The results of this step were statistically significant, F (1, 421) = 117.57, p < .001. Self-efficacy to resist risky behaviors was used as the predictor variable on the third step of the mediation analysis, with risky drug behaviors used as the criterion variable. The results of this analysis were statistically significant, F (1, 421) = 112.44, p < .001. Holding self-efficacy to resist risky behaviors constant on the fourth step of the mediation analysis, the amount of variance explained on the relation between sensation seeking and risky drug behaviors decreased from 15% on the first step to 4% on the fourth step. While the amount of explained variance decreased substantially, the relation between sensation seeking and risky drug behaviors remained statistically significant, t = -7.48, p < .001. Because of the decrease in explained variance, Sobel's test was used to determine if self-efficacy to resist risky behavior was partially mediating the relation between sensation seeking and risky drug behavior. The results of this analysis were statistically significant, Sobel statistic = 7.70, p < .001. Based on this finding, it appears that the relation between sensation seeking and risky drug behavior is partially mediated by self-efficacy to resist risky behavior.

The third mediation analysis for this hypothesis used sensation seeking as the predictor variable, risky alcohol behavior as the criterion variable, and self-efficacy to resist risky behavior as the mediating variable (see Table 34).

Table 34

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Sensation Seeking and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Sensation Seeking	Risky Alcohol Behaviors	.19	101.27	.44**
Step 2				
Sensation Seeking	Self-efficacy to Resist Risky Behaviors	.22	117.56	-.47**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Alcohol Behaviors	.26	145.45	-.51**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Alcohol Behaviors	.26	145.45	-.51**
Sensation Seeking		.05	94.26	.26**
Sobel Test = 8.26, p < .001				

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis tested the relation between sensation seeking and risky alcohol behaviors. The results of this analysis were statistically significant, F (1, 421) = 101.27, $p < .001$. The relation between sensation seeking and self-efficacy to resist risky behaviors was tested on the second step of the mediation analysis. A statistically significant result was obtained for this analysis, F (1, 421) = 117.56, $p < .001$. When the relation between self-efficacy to resist risky behaviors and risky alcohol behaviors was tested on the third step of the mediation analysis, the result was statistically significant, F (1, 421) = 145.45, $p < .001$. Holding the mediating variable, self-efficacy to resist risky behaviors constant on the fourth step of the mediation analysis, the relation between sensation seeking and risky alcohol behaviors remained statistically significant, although the amount of explained variance decreased from 19% on the first step to 5% on the fourth step. To determine if self-efficacy to resist risky behaviors was partially mediating the relation between sensation seeking and risky alcohol behaviors, Sobel's test was used. The results of this analysis were statistically significant (Sobel

statistic = 8.26, $p < .001$) indicating that self-efficacy to resist risky behaviors was partially mediating the relation between sensation seeking and risky alcohol behaviors.

The results of the three mediation analyses were used to determine if self-efficacy to resist risky behaviors was mediating the relations between sensation seeking and risky sex, drug, and alcohol behaviors were statistically significant. Partial mediation outcomes were obtained for the three risky behaviors. Based on these results, the null hypothesis that sensation seeking and risk taking behavior cannot be mediated by self-efficacy to resist risky behavior was rejected.

H_{4b}: The relation between perceived peer risk taking behavior and risk taking behavior can be mediated by self-efficacy to resist risky behavior.

Three mediation analyses were used to test the hypothesis that self-efficacy to resist risky behaviors was mediating the relations between perceived peer involvement in sex, drug, and alcohol risk taking behavior (predictor variable) and sex, drug, and alcohol risk taking behaviors (criterion variable). The results for risky sex behaviors are in Table 35.

Table 35

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Perceived Peer Involvement in Risky Sex Behaviors and Risky Sex Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Sex Behaviors	Risky Sex Behaviors	.17	82.06	.41**
Step 2				
Perceived Peer Involvement in Risky Sex Behaviors	Self-efficacy to Resist Risky Behaviors	.05	21.30	-.23**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Sex Behaviors	.11	51.38	-.33**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Sex Behaviors	.11	51.38	-.33**
Perceived Peer Involvement in Risky Sex Behaviors		.01	59.17	.35**
Sobel Test = 3.90, p < .001				

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis provided support that perceived peer involvement in risky sex behaviors was accounting for a statistically significant amount of variance ($R^2 = .17$) in risky sex behaviors, F (1, 404) = 82.06, $p < .001$. Perceived peer involvement in risky sex behaviors was found to be a statistically significant predictor of self-efficacy to resist risky behaviors on the second step of the mediation analysis, F (1, 400) = 21.30, $p < .001$. On the third step of the mediation analysis, self-efficacy to resist risky behaviors was explaining a statistically significant amount of variance in risky sex behaviors, F (1, 417) = 51.38, $p < .001$. After holding self-efficacy to resist risky behaviors constant on the fourth step of the mediation analysis, perceived peer involvement in risky sex behaviors explained a reduced amount of variance in risky sex behaviors from 17% to 1%, $t = 7.85$, $p < .001$. Although the amount of explained variance decreased substantially from the first to the fourth step of the mediation analysis, the result remained statistically significant. To determine if self-efficacy to resist risky behaviors was partially mediating the relation between perceived peer involvement in risky sex behaviors

and risky sex behaviors, a Sobel test was completed. The results of this analysis were statistically significant (Sobel statistic = 3.90, $p < .001$), indicating a partial mediation between perceived peer involvement in risky sex behaviors and risky sex behaviors.

The second mediation analysis used risky drug behaviors as the criterion variable, perceived peer involvement in risky drug behaviors as the predictor variable, and self-efficacy to resist risky behaviors as the mediating variable (see Table 36).

Table 36

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Perceived Peer Involvement in Risky Drug Behaviors and Risky Drug Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Drug Behaviors	Risky Drug Behaviors	.12	55.00	.35**
Step 2				
Perceived Peer Involvement in Risky Drug Behaviors	Self-efficacy to Resist Risky Behaviors	.04	15.27	-.19**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Drug Behaviors	.21	111.69	-.46**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Drug Behaviors	.21	111.69	-.46**
Perceived Peer Involvement in Risky Drug Behaviors		.07	77.67	.27**
Sobel Test = 3.64, p < .001				

*$p \leq .05$; **$p \leq .01$

The first step of the mediation analysis examined the relation between perceived peer involvement in risky drug behaviors and risky drug behaviors. The results of this analysis were statistically significant, F (1, 396) = 55.00, $p < .001$. The relation between perceived peer involvement in risky drug behaviors and self-efficacy to resist risky behaviors was tested on the second step of the mediation analysis. This relation was found to be statistically significant, F (1, 393) = 15.27, $p < .001$. A statistically significant relation was found between self-efficacy to

resist risky behavior and risky drug behaviors on the third step of the mediation analysis, F (1, 415) = 111.69, $p < .001$. After holding self-efficacy to resist risky behaviors constant on the fourth step of the mediation analysis, the amount of variance in risky drug behaviors that was explained by perceived peer involvement in risky drug behaviors was reduced from 12% on the first step of the mediation analysis to 7% on the fourth step, $t = 6.14$, $p < .001$. To determine if self-efficacy to resist risky behavior was partially mediating the relation between perceived peer involvement in risky drug behavior and risky drug behavior, the Sobel's test was performed. The results of this analysis were statistically significant (Sobel statistic = 3.64, $p < .001$), indicating that self-efficacy to resist risky behavior was a partial mediator of the relation between perceived peer involvement in risky drug behavior and risky drug behavior.

The third mediation analysis was used to determine if self-efficacy to resist risky behavior was mediating the relation between risky alcohol behavior and perceived peer involvement in risky alcohol behavior (see Table 37).

Table 37

Mediation Analysis – Mediating Role of Self-efficacy to Resist Risky Behaviors on the Relation between Perceived Peer Involvement in Risky Alcohol Behaviors and Risky Alcohol Behaviors

Predictor	Criterion	R^2	F	Standardized β
Step 1				
Perceived Peer Involvement in Risky Alcohol Behaviors	Risky Alcohol Behaviors	.23	118.24	.48**
Step 2				
Perceived Peer Involvement in Risky Alcohol Behaviors	Self-efficacy to Resist Risky Behaviors	.10	44.38	-.32**
Step 3				
Self-efficacy to Resist Risky Behaviors	Risky Alcohol Behaviors	.26	144.71	-.51**
Step 4				
Self-efficacy to Resist Risky Behaviors	Risky Alcohol Behaviors	.26	144.71	-.51**
Perceived Peer Involvement in Risky Alcohol Behaviors		.11	121.23	.35**
Sobel Test = 5.78, p < .001				

*$p \leq .05$; **$p \leq .01$

The first step of the mediation tested the relation between perceived peer involvement in risky alcohol behaviors and risky alcohol behaviors. This result was statistically significant, F (1, 396) = 118.24, $p < .001$. On the second step of the mediation, perceived peer involvement in risky alcohol behaviors was found to be a statistically significant predictor of self-efficacy to resist risky behaviors, F (1, 392) = 44.38, $p < .001$. The relation between self-efficacy to resist risky behaviors and risky alcohol behaviors was tested on the third step of the mediation analysis. This result was statistically significant, F (1, 416) = 144.71, $p < .001$. On the fourth step of the mediation analysis, after holding self-efficacy to resist risky behaviors constant, the amount of variance in risky alcohol behaviors explained by perceived peer involvement in risky alcohol behaviors decreased from 23% on the first step of the analysis to 11% on the final step, t = 8.36, $p < .001$. Although the amount of explained variance was reduced on the final step of the mediation analysis, the result remained statistically significant. To determine if self-efficacy was partially mediating the relation between perceived peer involvement in risky alcohol behaviors

and risky alcohol behaviors, a Sobel's test was completed. This test was statistically significant (Sobel statistic = 5.78, $p < .001$), indicating that self-efficacy to resist risky behavior was partially mediating the relation between perceived peer involvement in risky alcohol behaviors and risky alcohol behaviors.

The three mediation analyses used to test the hypothesis that self-efficacy to resist risky behaviors was mediating the relation between perceived peer involvement in risky sex, alcohol, and drug behaviors and risky sex, alcohol, and drug behaviors provided evidence of partial mediations. Based on these findings, the null hypothesis of no mediation effects is rejected.

Nonhypothesized Findings

A posteriori exploratory analyses were completed to determine if the present study's findings were consistent with previous research (Baer, 2002; Borsai & Carey, 2003; Perkins, Haines, & Rice, 2005; Perkins & Wechsler, 1996) that has reported emerging adults tend to report their peers as having higher levels of involvement in risky behaviors than they do. Perceived peer involvement in risky behaviors has been shown to be a statistically significant predictor in emerging adults' self-reported involvement in these behaviors. Knowing if participants in the present study were reporting their peers' involvement as higher than their own behaviors was important to confirm the assumption that the sample in the present study reflected participants in earlier research. The scores for the self-reported involvement in risky behaviors, sex, drugs, and alcohol, were compared to scores for perceived peer involvement in risky sex, drug, and alcohol behaviors using t-tests for dependent samples (see Table 38).

Table 38

t-Tests for Dependent Samples – Comparison of Self-reported Involvement in Risky Behaviors with Perceived Peer Involvement in Risky Behaviors

Risky Behaviors	*N*	*M*	*SD*	*DF*	*t*	Sig
Sex						
Self	406	1.59	.68	405	-17.48	<.001
Peer	406	2.57	1.21			
Drugs						
Self	398	1.31	.62	397	-11.47	<.001
Peer	398	1.94	1.14			
Alcohol						
Self	398	1.81	.98	397	-14.78	<.001
Peer	398	2.79	1.49			

Statistically significant differences were obtained for each of the three risky behaviors, sex, drugs, and alcohol. The comparison of self-reported involvement in risky sex behaviors (M = 1.59, SD = .68) was significantly lower than perceived peer involvement in risky sex behaviors (M = 2.56, SD = 1.21), t (405) = -17.48, p < .001. The difference between self-reported involvement in risky drug behaviors (M = 1.31, SD = .62) and perceived peer involvement in risky drug behaviors (M = 1.94, SD = 1.13) was statistically significant, t (397) = -11.46, p < .001. Results of the comparison of self-reported involvement in risky alcohol behaviors (M = 1.81, SD = .98) with perceived peer involvement in risky alcohol behavior (M = 2.79, SD = 1.49) were statistically significant, t (397) = -14.78, p < .001. These findings indicate that emerging adults were more likely to report higher perceived peer involvement in risky behaviors than their self-reported involvement in these behaviors.

In several studies, researchers (Greene et al., 2000; Hovarth & Zuckerman, 1993; Rosenbloom, 2003; Yanovitsky, 2006) investigated differences between high and low sensation seeking emerging adults relative to their involvement in risky behaviors. To determine if the present sample was consistent with previous findings, comparisons for all variables between high

and low sensation seeking emerging adults were completed. No specific study provided scores that could be used to differentiate between high and low sensation seekers.

Based on a study by Rowland and Heatherton (1987), the scores for sensation seeking were divided into three groups using 33% and 67% as cut-off points. The scores in the lower 33% (0 to 14) were placed in the low sensation-seeking group. Scores in the upper 33% (20 to 35) were included in the high sensation-seeking group. The scores in the mid-section (15 to 19) were eliminated from the study as a means of differentiating between the high and low sensation seekers. Frequency distributions were used to indicate the number of high, midlevel, and low sensation seekers (see Table 39).

Table 39

Frequency Distribution – Sensation Seeking Divided into Three Groups

Group	Number	Percent
Low sensation seekers (0 to 14)	143	33.8
Midlevel sensation seekers (15 to 19) - Eliminated	*101*	*23.9*
High sensation seekers (20 to 35)	179	42.3
Total	423	100.0

The low sensation seeker group (n = 143, 33.8%) had sensation seeking scores from 0 to14. The high sensation seeker group (n = 179, 42.3%) had scores that ranged from 20 to 35. The middle group, with scores from 15 to 19 (n = 101, 23.9%) were eliminated from further analyses.

The self-reported involvement in risky sex, drug, and alcohol behaviors were used as the dependent variables in a one-way MANOVA. High and low sensation seekers were used as the independent variable in this analysis (see Table 40).

Table 40

Multivariate Analysis of Variance – Self-reported Involvement in Risky Sex, Drug, and Alcohol Behaviors by Sensation Seeker Group

Hotelling's Trace	*F* Ratio	*DF*	Sig	Effect Size
.30	31.21	3, 316	<.001	.23

The results of the one-way MANOVA comparing self-reported involvement in risky behaviors by high and low sensation seekers was statistically significant, F (3, 316) = 31.21, p < .001, d = .23. The moderate effect size of .23 provided additional evidence that this finding had both statistical significance as well as practical significance. This finding indicated that self-reported involvement in risky behaviors differed between high and low sensation seekers. To determine which of the three types of risky behaviors were contributing to the statistically significant result, the between subject effects were examined (see Table 41).

Table 41

Between Subject Effects – Frequency of Self-reported Involvement in Risky Behaviors by Sensation Seeking Group (N = 423)

Source	Sum of Squares	*DF*	Mean Square	*F* Ratio	Sig	Effect Size
Sex	14.52	1, 318	14.52	39.56	<.001	.11
Drugs	16.59	1, 318	16.58	47.17	<.001	.13
Alcohol	60.22	1, 318	60.22	75.15	<.001	.19

The three types of risky behaviors, sex, drugs, and alcohol, differed significantly between high and low sensation seekers. The effect sizes were small to medium, indicating the results had both statistical and practical significance. To determine the direction of the statistically significant differences, descriptive statistics were obtained for each of the three types of risky behaviors by low and high sensation seekers (see Table 42).

Table 42

Descriptive Statistics - Frequency of Self-reported Involvement in Risky Behaviors by Low and High Sensation Seekers

	Sensation Seekers					
	Low			High		
Subscale	*N*	*M*	*SD*	*N*	*M*	*SD*
Sex	142	1.35	.51	178	1.78	.67
Drugs	142	1.07	.26	178	1.53	.76
Alcohol	142	1.35	.54	178	2.23	1.10

The low sensation seekers (*M* = 1.35, *SD* = .51) had significantly lower mean scores for self-reported involvement in risky sex behaviors than high sensation seekers (*M* = 1.78, *SD* = .67). The mean scores for self-reported involvement in risky drug behaviors were significantly lower for low sensation seekers (*M* = 1.07, *SD* = .26) than for high sensation seekers (*M* = 1.53, *SD* = .76). When the mean scores were compared for self-reported involvement in risky alcohol behaviors, low sensation seekers (*M* = 1.35, *SD* = .54) had significantly lower scores than high sensation seekers (*M* = 2.23, *SD* = 1.10). Based on these findings, it appears that low sensation seekers were less likely to be involved in risky sex, drugs, and alcohol behaviors than high sensation seekers.

The mean scores for perceived peer involvement in risky sex, drugs, and alcohol behaviors were used as the dependent variables in a one-way MANOVA. High and low sensation seeking was used as the independent variable in this analysis (see Table 43).

Table 43

Multivariate Analysis of Variance – Perceived Peer Involvement in Risky Sex, Drug, and Alcohol Behaviors by Sensation Seeker Group

Hotelling's Trace	*F* Ratio	*DF*	Sig	Effect Size
.08	8.33	3, 296	<.001	.08

The results of the comparison of perceived peer involvement in risky sex, drug, and alcohol behaviors between low and high sensation seekers was statistically significant, F (3, 296) = 8.33, $p < .001$, $d = .08$. The small effect size indicates that even though the difference between low and high sensation seekers was statistically significant, the result may have little practical significance. To determine which of the three types of risky behaviors was contributing to the statistically significant result, the between subject effects were examined (see Table 44).

Table 44

Between Subject Effects – Frequency of Perceived Peer Involvement in Risky Behaviors by Sensation Seeking Group (N = 423)

Source	Sum of Squares	*DF*	Mean Square	*F* Ratio	Sig	Effect Size
Sex	21.50	1, 298	21.50	15.26	<.001	.05
Drugs	11.05	1, 298	11.05	9.76	.002	.03
Alcohol	49.75	1, 298	49.75	24.00	<.001	.08

The results of the between subjects effects comparing perceived peer involvement in risky sex, drug, and alcohol behaviors were statistically significant. The effect sizes were small, indicating that while the differences between low and high sensation seekers was statistically significant, findings have little practical significance. To determine the direction of the statistically significant results, descriptive statistics were obtained for each of the risky behaviors by group (see Table 45).

Table 45

Descriptive Statistics - Frequency of Perceived Peer Involvement in Risky Behaviors by Low and High Sensation Seekers

	Sensation Seekers					
	Low			High		
Subscale	*N*	*M*	*SD*	*N*	*M*	*SD*
Sex	133	2.28	1.22	167	2.82	1.16
Drugs	133	1.70	1.05	167	2.08	1.08
Alcohol	133	2.36	1.43	167	3.18	1.45

The mean score for low sensation seekers (*M* = 2.28, *SD* = 1.22) on perceived peer involvement in risky sex behaviors was lower than the mean score for high sensation seekers (*M* = 2.82, *SD* = 1.16). When the mean scores for perceived peer involvement in risky drug behaviors were compared, low sensation seekers (*M* = 1.70, *SD* = 1.05) had significantly lower scores than high sensation seekers (*M* = 2.08, *SD* = 1.08). Low sensation seekers (*M* = 2.36, *SD* = 1.43) had significantly lower mean scores for perceived peer involvement in risky alcohol behaviors than high sensation seekers (*M* = 3.18, *SD* = 1.45). These findings provide support that high sensation seekers were more likely to perceive that their peers were involved in risky behaviors than low sensation seekers.

The remaining three variables used in the study, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behaviors, were used in separate t-tests for two independent variables. The independent variable in each of these analyses was high and low sensation seeking (see Table 46).

Table 46

t-Tests for Two Independent Sample – General Resistance to Peer Influence, Emotion Regulation, and Self-efficacy to Resist Risky Behaviors by High and Low Sensation Seeking

Variable	*N*	*M*	*SD*	*DF*	*t*	Sig
General Resistance to Peer Influence						
Low Sensation Seekers	131	3.09	.53	291	1.80	.073
High Sensation Seekers	162	2.99	.47			
Emotion Regulation						
Low Sensation Seekers	143	2.27	.65	320	-.57	.568
High Sensation Seekers	179	2.31	.62			
Self-efficacy to Resist Risky Behaviors						
Low Sensation Seekers	141	4.58	.73	318	8.41	<.001
High Sensation Seekers	179	3.74	1.00			

One variable, self-efficacy to resist risky behaviors, differed significantly between low (M = 4.58, SD = .73) and high (M = 3.74, SD = 1.00) sensation seekers, t (318) = 8.41, p < .001. This result indicated that low sensation seekers had higher levels of self-efficacy to resist risky behaviors than high sensation seekers. No statistically significant differences were found for general resistance to peer influence and emotion regulation.

Summary

Chapter 4 has presented the results of the statistical analyses that were used to describe the sample and test the research questions and associated hypotheses. In addition, unhypothesized findings also were presented. A discussion of the findings and recommendations for practice and further research are included in Chapter 5.

CHAPTER 5

DISCUSSION

The purpose of the study was to examine in an emerging adult college student sample the relations between their risk taking behaviors and intrapersonal factors unique to the individual. The risk taking behaviors were activities involving sex, drugs, and alcohol. The intrapersonal factors were sensation seeking, perceived peer risk taking behavior, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior. The results of the present study were mixed, with approximately half of the hypotheses supported.

The first hypothesis was that the combination of the predictor variables (sensation seeking, perceived peer risk taking, general resistance to peer influence, emotion regulation, and self-efficacy to resist risky behavior) would explain a significant proportion of variance in each of the criterion variables (risk taking behavior in the areas of sex, drugs, and alcohol after controlling for age and gender). Perceived peer involvement in risky behaviors, self-efficacy to resist risky behaviors, and sensation seeking were statistically significant predictors of self-reported involvement in risky behaviors.

Students who had stronger perceptions that their peers were involved in risky behaviors were more likely to be involved in these types of behaviors. Emerging adults have a tendency to over-estimate the extent to which their peers are involved in these types of behaviors. They may use their perceptions of their peers' involvement as a way to justify their own behaviors. By overestimating the norm of their peers' activities, students might increase their risk taking behaviors in an effort to 'fit in with the crowd' and gain the reward of social acceptance. Students' misperceptions of risk taking norms might be used to rationalize students' increased levels of risk taking, (i.e., "everybody's doing it and doing it more than I am").

Lower scores on perceptions of peer involvement in risky drug behaviors were related to increased self-reported involvement in risky behaviors involving alcohol. The lower perceptions of peer involvement in risky drug behaviors might have increased alcohol use, because in comparing drug use to drinking, students may have regarded drug use as more dangerous than drinking. Students could then rationalize their increased drinking (i.e., I'm only drinking, not using drugs).

An unexpected finding was that self-efficacy was the strongest predictor of risky drug and alcohol behaviors. This finding provided additional support for the importance of self-efficacy to resist risky behaviors as a protective factor that could help minimize involvement in risky behaviors. The use of drugs could have observable, continuing, and devastating results (i.e., debilitating addiction or death) resulting in individuals deciding to draw the line in the use of drugs. This finding also might result from emerging adult college students' first hand observations of the negative effects of risky alcohol use (e.g., loss of control over one's behavior, injuries from accidents or fighting involving alcohol, unwanted sexual advances or date rape). This unexpected finding was interesting because individuals' levels of self-efficacy could be increased and might be relevant to the development of treatment modes for risk taking behavior.

Sensation seeking was a statistically significant predictor of self-reported involvement in risky sex, drugs, and alcohol behaviors among emerging adults, although the amount of variance explained for each behavior was lower than expected. As a personality trait, sensation seeking may be difficult to control and may contribute to involvement in risky behaviors by emerging adults. Most of the students in the present study were commuter students who were living at home with their parents. Students may have had decreased opportunities to be involved in sensation seeking involving risky sex, drug, and alcohol use than students living away from home in apartments or at residence colleges and universities. Another consideration is that these

students may be engaging in sensation seeking activities other than risky sex, drug, and alcohol behaviors (e.g., high-risk sports, emotionally exciting movies and video games, stimulating music).

The second hypothesis was that perceived peer risk taking behavior was expected to be the strongest predictor of self-reported involvement in risky sex, drugs, and alcohol behaviors, followed by sensation seeking. Perceived peer involvement in risk taking sex behaviors did emerge as the strongest predictor of self-reported risky sex behaviors, followed by self-efficacy and sensation seeking. The strongest predictor of the frequency of involvement in risky drug behavior and risky alcohol behavior was self-efficacy to resist risk taking behaviors while perceived peer involvement in risky drug and alcohol behavior was the second strongest predictor, followed by sensation seeking. Drug and alcohol use are not biologically based with the exception of addiction to a drug or alcohol and a genetic vulnerability to addiction. Perceived peer involvement in risky sexual behaviors was the strongest predictor variable of self-reported involvement in risky sex activity. Engagement in sexual activity is a biologically-based human drive and as such may have heightened the influence of perceived peer involvement in risky sexual behaviors.

The next set of analyses involved hypothesized mediation between variables. Emotion regulation, general resistance to peer influence, and self-efficacy to resist risk taking behaviors were used as mediators of the relations between sensation seeking and self-reported risk taking behaviors (sex, drug, and alcohol behaviors) and of the relations between perceived peer involvement in risky behaviors (sex, drug, and alcohol behaviors) and self-reported risk taking behaviors (sex, drug, and alcohol behaviors). Only self-efficacy to resist risky behavior was found to be partially mediating the relation between sensation seeking and self-reported involvement in risky behaviors and between perceived peer involvement in risky behaviors and

self-reported involvement in risky behaviors. The first two mediators, emotion regulation and resistance to peer influence, were not mediating the relations between sensation seeking, perceived peer involvement in risky behaviors and self-reported risky behaviors.

Emerging adults who were more likely to seek out sensation seeking activities also were more likely to self-report greater involvement in risky behaviors. However, when self-efficacy to resist risky behaviors was controlled, the relation between sensation seeking and involvement in risky behaviors was reduced. Emerging adults with a personality trait that supports sensation seeking also may tend to be involved in risk taking behaviors. When self-efficacy to resist, as a learned skill, is an available tool to these individuals, they may be less likely to want to be involved in risky behaviors.

Individuals with higher levels of self-efficacy to resist peer influence to engage in risk taking behaviors could be less dependent on the degree of the reward, (i.e., peer approval and acceptance) they would receive by going along with the crowd than those with lower levels of self-efficacy to resist risky behaviors. Additionally, individuals with higher levels of self-efficacy to resist risk taking behaviors may have learned to use and have been successful using ways to maintain peer acceptance without engaging in risk taking behaviors. For example, they might have developed skills to use humor to defuse tension or deflect conflict, consequently maintaining group approval and status without following the crowd involving risk taking behaviors. Another example may be the individual who chooses to abstain and then assumes the role of driver for taking his or her friends home after parties or other social gatherings.

Limitations and Directions for Future Research

A limitation of the study was the use of a single university from which the sample was selected. The sample of the present study was drawn from students at a large, urban, Midwestern university who volunteered to participate in the study, rather than being selected randomly. Volunteers may have had a personal interest in the study topic that could bias their responses. The anonymity of the participants and the confidentiality of their responses notwithstanding, some volunteers might have been afraid of revealing their behavior in these areas that could have affected their responses. Future research could use an Internet survey posted on the university's website to obtain a more representative sample of students at the university. By not approaching students in their classrooms, their anonymity could be further protected, providing them with opportunities to answer honestly and openly.

A second limitation was that the students who were attending the university were mostly commuters, living off campus. Because of the urban setting of the university in the present study, many students commuted from parents' homes or from independent living situations such as apartments and shared houses. Fewer students live on campus in dorms or apartments. Students who lived at home with parents might have fewer opportunities to engage in risk taking behaviors. Results of the present study may not generalize to colleges and universities where living in university housing or nearby apartments is the norm. Future research could extend the study to include universities in different locations, different population numbers, and residential universities where students are likely more separated from family influences. Using different types of universities could allow comparisons between commuter and residential students to determine if living on campus leads to greater involvement in risky behaviors.

The Difficulties with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) measures emotion regulation in general terms. A domain-specific measure for emotion regulation

in regard to risky behaviors may have provided results that were specific to the topic being studied. The Resistance to Peer Influence (RPI; Steinberg & Monahan, 2007) was difficulty for students to complete because of the confusing nature of the items and the way the students had to respond. The format of the scale could be revised to simplify the instructions and place all possible responses on the same side. Self-efficacy to Resist Risk Taking Behaviors was developed by the researcher specifically for this dissertation. While the instrument was found to have excellent internal consistency as a measure of reliability and good face validity, additional testing is needed to determine the criterion and content validity.

The study was limited to risky behaviors involving sex, drugs, and alcohol. Future studies could consider other types of risky behaviors (sports, illegal or unethical behaviors, violence in movies and video games, etc.). Understanding how self-efficacy and peer pressure are related to these types of behaviors could be useful in reducing their involvement in these types of behaviors.

Future research could use a longitudinal research design using the same variables with students beginning as freshmen and following through to completion of their senior year to investigate risk taking behavioral changes over time. The present study used students from 18 to 25 years. A longitudinal study could provide information regarding changes as the same cohort of students enter the emerging adult phase through completion of this developmental period.

Future studies could determine correlates of high levels of self-efficacy to resist risk taking behaviors that could be integrated into treatment modalities. The outcomes from this study could be used to develop treatment programs to assist emerging adults who need help to control their involvement in risky behaviors.

A final future research direction, extending from the study, could involve designing an intervention using small groups of emerging adults (treatment and control) to examine changes

in levels of self-efficacy to resist risk taking behaviors following treatment. Both groups would complete pretests prior to beginning the treatment and posttests after an eight-week treatment program. The treatment would be provided to the experimental group and nothing to the control group to determine if the levels of self-efficacy increase in the original treatment group and if the control group's levels of self-efficacy remain constant.

Summary and Implications for Practice

Despite limitations mentioned above, the results of this study provide important information about the findings of the present study that can inform mental health professionals' approach and interventions with emerging adults. The findings that perceptions of peer involvement in risky behaviors, self-efficacy to resist risky behaviors, and sensation seeking were statistically significant predictors of self-reported involvement in risky behaviors has implications for practice. While sensation seeking is a personality trait, the other two predictors are learned and can be changed with educational interventions and treatment. Teaching emerging adults to recognize when they are engaging in risky behaviors because their friends are doing the same can be helpful in reducing their involvement in these behaviors. The role of self-efficacy in resisting risky behaviors needs to be enhanced during treatment interventions. The therapist could use vicarious learning and role playing to help emerging adults build their self-efficacy beliefs that they can resist participation in risky behaviors. When emerging adults have become aware of their peers' actual involvement in risky behaviors and have developed self-efficacy beliefs that they can resist these behaviors, they may be able to control their desires to participate in sensation seeking activities.

Aligned with prior research, the present study found that participants tended to overestimate their peers' risk taking behaviors compared to their own. Mental health professionals could discuss this bias with emerging adults and provide information regarding

accurate rates of risk taking behaviors of their peer groups. Past research has found that exposure to accurate information about peers' actual frequency and quantity of risk taking has resulted in decreased students' risk taking behaviors (Perkins & Craig, 2006).

The finding that self-efficacy to resist risk taking behaviors was partially mediating the relation between sensation seeking and self-reported involvement in risk taking behaviors and between perceived peer risk taking behavior and self-reported involvement in risk taking behavior provides a possible venue for developing interventions that could decrease the frequency of emerging adults' risk taking behaviors. This information could be used by mental health professionals to help their clients develop strategies that have been shown to increase self-efficacy to resist risk taking behaviors of emerging adults, especially for those who have higher levels of susceptibility to peer influence and want to avoid or decrease involvement in risk taking behaviors. As noted earlier, these findings have application for both researchers and practitioners, and can be informative for both current use and expanded future work.

APPENDIX A

INSTRUMENTS

To complete Questionnaires 1 and 2, please refer to this page for examples.

A list of illicit drugs and drugs used to get "high" including some of their street names:

Marijuana: pot, weed, hashish, hash oil
Cocaine: coke, crack, rock, freebase; any form of cocaine
Hallucinogens: LSD (acid), PCP (angel dust), psilocybin (mushrooms), mescline
Amphetamines: uppers, bennies, beans, speed, crank, crystal meth, diet pills
Inhalants: glue, gases, solvents, aerosol sprays
Opiates: heroin (smack, junk, horse)

Other drugs:

Club and rave drugs: ecstacy, methamphetamine, ketamine (Special K, K, or Ket), and sedatives: commonly known as date rape drugs: GHB (G, liquid ecstacy, liquid X, Liquid E) and Rohypnol (rophy, ruffles, roach 2, roachies, roche, roofies, ruffies, ruff up, rib, rope, ropies, circle, circes, "forget it", "forget-me-pill", "Mexican Valium")
Anabolic steroids (roids, juice)

Prescription drugs used to get high:

pain killers (Oxycontin, Vicodin), anti-anxiety drugs (Xanax, Valium), stimulants (Adderall, Ritalin)

One alcoholic drink is equal to:

one 12 ounce beer, one 8 oz. malt liquor, one 5 oz. glass of wine, or 1.5 oz. or a "shot" of liquor (for example; gin, rum, scotch, vodka, whiskey)

QUESTIONNAIRE 1

Please complete the following sentence:

A. A regular partner is someone that I have dated for at least _____ (specify number) weeks.
When asked about a regular partner below, please use this definition.

B. We would like to know how often you participated in the following activities during the past 6 months. Please **circle the number of times** that you engaged in each behavior **over the past 6 months**.

	Number of Times in the Past 6 Months						
1. Had sex with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
2. Had sex without protection against pregnancy with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
3. Had sex without protection against sexually transmitted diseases with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
4. Used condoms for sexual intercourse with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
5. Had sexual intercourse while under the influence of alcohol with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
6. Had sexual intercourse while under the influence of drugs other than alcohol with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
7. Had sex without a condom with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+

Please **circle the number of times** you engaged in each behavior **over the past 6 months**.

8. Sex with someone other than my regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
9. Sex with a NEW partner	0	1	2-4	5-9	10-20	21-30	31+
10. Left a social event with someone I just met or did not know well.	0	1	2-4	5-9	10-20	21-30	31+
11. Chose to abstain from sexual activity due to concerns about pregnancy or sexually transmitted diseases.	0	1	2-4	5-9	10-20	21-30	31+

IF **FEMALE**, GO TO **QUESTION 12**. IF **MALE**, GO TO **QUESTION 17**.

12. Had sexual intercourse because partner used verbal pressure or threats	0	1	2-4	5-9	10-20	21-30	31+
13. Had sexual intercourse because partner used physical force	0	1	2-4	5-9	10-20	21-30	31+
14. Was drunk with someone I did not know well	0	1	2-4	5-9	10-20	21-30	31+
15. Had sexual intercourse because partner was too aroused to stop	0	1	2-4	5-9	10-20	21-30	31+
16. Had sexual intercourse because of partner's continual pressure (e.g., threats to end relationship)	0	1	2-4	5-9	10-20	21-30	31+

IF **FEMALE**, GO TO **QUESTION 22**

17. Convinced partner to have sexual intercourse through verbal pressure or threats	0	1	2-4	5-9	10-20	21-30	31+
18. Convinced partner to have sexual intercourse through use of physical force	0	1	2-4	5-9	10-20	21-30	31+
19. Made sexual advances toward a drunk date	0	1	2-4	5-9	10-20	21-30	31+
20. Convinced partner to have sexual intercourse because I was too aroused to stop	0	1	2-4	5-9	10-20	21-30	31+
21. Convinced partner to have sexual intercourse through continual pressure (e.g., threats to end relationship)	0	1	2-4	5-9	10-20	21-30	31+

Please **circle the number of times** that you engaged in each behavior **over the past 6 months**.

22. Tried/used drugs other than alcohol:							
a. Marijuana	0	1	2-4	5-9	10-20	21-30	31+
b. Cocaine	0	1	2-4	5-9	10-20	21-30	31+
c. Hallucinogens	0	1	2-4	5-9	10-20	21-30	31+
d. Amphetamines (speed)	0	1	2-4	5-9	10-20	21-30	31+
e. Inhalants	0	1	2-4	5-9	10-20	21-30	31+
f. Other (Specify _____)	0	1	2-4	5-9	10-20	21-30	31+
23. Drove after drinking:							
a. 1-2 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
b. 3-4 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
c. 5 or more alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
24. Drank more than 5 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
25. Drank alcohol too quickly	0	1	2-4	5-9	10-20	21-30	31+
26. Mixed drugs and alcohol	0	1	2-4	5-9	10-20	21-30	31+
27. Played drinking games	0	1	2-4	5-9	10-20	21-30	31+
28. Rode in a car with someone who had consumed alcohol	0	1	2-4	5-9	10-20	21-30	31+

QUESTIONNAIRE 2

Please complete the following sentence:

C. A regular partner is someone that your peer has dated for at least _____ (specify number) weeks. When asked about a regular partner below, please use this definition.

D. We would like to know how often you think your peers participated in the following activities during the past 6 months. Please **circle the number of times** for each behavior **over the past 6 months**.

	Number of Times in the Past 6 Months						
1. Had sex with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
2. Had sex without protection against pregnancy with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
3. Had sex without protection against sexually transmitted diseases with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
4. Used condoms for sexual intercourse with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
5. Had sexual intercourse while under the influence of alcohol with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
6. Had sexual intercourse while under the influence of drugs other than alcohol with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+
7. Had sex without a condom with:							
. . . a regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
. . . someone I just met or do not know well	0	1	2-4	5-9	10-20	21-30	31+

Please **circle the number of times** you engaged in each behavior **over the past 6 months**.

8. Sex with someone other than my regular partner (as defined in A)	0	1	2-4	5-9	10-20	21-30	31+
9. Sex with a NEW partner	0	1	2-4	5-9	10-20	21-30	31+
10. Left a social event with someone I just met or did not know well.	0	1	2-4	5-9	10-20	21-30	31+
11. Chose to abstain from sexual activity due to concerns about pregnancy or sexually transmitted diseases.	0	1	2-4	5-9	10-20	21-30	31+

IF **FEMALE**, GO TO **QUESTION 12**. IF **MALE**, GO TO **QUESTION 17**.

12. Had sexual intercourse because partner used verbal pressure or threats	0	1	2-4	5-9	10-20	21-30	31+
13. Had sexual intercourse because partner used physical force	0	1	2-4	5-9	10-20	21-30	31+
14. Was drunk with someone I did not know well	0	1	2-4	5-9	10-20	21-30	31+
15. Had sexual intercourse because partner was too aroused to stop	0	1	2-4	5-9	10-20	21-30	31+
16. Had sexual intercourse because of partner's continual pressure (e.g., threats to end relationship)	0	1	2-4	5-9	10-20	21-30	31+

IF **FEMALE**, GO TO **QUESTION 22**

17. Convinced partner to have sexual intercourse through verbal pressure or threats	0	1	2-4	5-9	10-20	21-30	31+
18. Convinced partner to have sexual intercourse through use of physical force	0	1	2-4	5-9	10-20	21-30	31+
19. Made sexual advances toward a drunk date	0	1	2-4	5-9	10-20	21-30	31+
20. Convinced partner to have sexual intercourse because I was too aroused to stop	0	1	2-4	5-9	10-20	21-30	31+
21. Convinced partner to have sexual intercourse through continual pressure (e.g., threats to end relationship)	0	1	2-4	5-9	10-20	21-30	31+

Please **circle the number of times** that you engaged in each behavior **over the past 6 months**.

22. Tried/used drugs other than alcohol:							
g. Marijuana	0	1	2-4	5-9	10-20	21-30	31+
h. Cocaine	0	1	2-4	5-9	10-20	21-30	31+
i. Hallucinogens	0	1	2-4	5-9	10-20	21-30	31+
j. Amphetamines (speed)	0	1	2-4	5-9	10-20	21-30	31+
k. Inhalants	0	1	2-4	5-9	10-20	21-30	31+
l. Other (Specify _____)	0	1	2-4	5-9	10-20	21-30	31+
23. Drove after drinking:							
d. 1-2 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
e. 3-4 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
f. 5 or more alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
24. Drank more than 5 alcoholic beverages	0	1	2-4	5-9	10-20	21-30	31+
25. Drank alcohol too quickly	0	1	2-4	5-9	10-20	21-30	31+
26. Mixed drugs and alcohol	0	1	2-4	5-9	10-20	21-30	31+
27. Played drinking games	0	1	2-4	5-9	10-20	21-30	31+
28. Rode in a car with someone who had consumed alcohol	0	1	2-4	5-9	10-20	21-30	31+

Interest and Preference Test

Directions: Each of the items below contains two choices A and B. Please indicate which of the choices most describes your likes or the way you feel. In some cases, you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases, you may find items in which you do not like either choice. In these cases mark the choice you dislike least. Do not leave any items blank. It is important you respond to all items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give your honest appraisal of yourself.

1	A	I like "wild" uninhibited parties.
	B	I prefer quiet parties with good conversation.
2	A	There are some movies I enjoy seeking a second or even third time.
	B	I can't stand watching a movie that I've seen before.
3	A	I often wish I could be a mountain climber.
	B	I can't understand people who risk their necks climbing mountains.
4	A	I dislike all body odors.
	B	I like some of the earthy body smells.
5	A	I get bored seeing the same old faces.
	B	I like the comfortable familiarity of everyday friends.
6	A	I like to explore a strange city or section of town by myself, even if it means getting lost.
	B	I prefer a guide when I am in a place I don't know well.
7	A	I dislike people who do or say things just to shock or upset others.
	B	When you can predict almost everything a person will do and say he or she must be a bore.
8	A	I usually don't enjoy a movie or plan where I can predict what will happen in advance.
	B	I don't mind watching a movie or play where I can predict what will happen in advance.
9	A	I have tried marijuana or would like to.
	B	I would never smoke marijuana.
10	A	I would not like to try any drug which might produce strange and dangerous effects on me.
	B	I would like to try some of the drugs that produce hallucinations.
11	A	A sensible person avoids activities that are dangerous.
	B	I sometimes like to do things that are a little frightening.
12	A	I dislike "swingers" (people who are uninhibited and free about sex).
	B	I enjoy the company of real "swingers."
13	A	I find that stimulants make me uncomfortable.
	B	I often like to get high (drinking liquor or smoking marijuana).

14	A	I like to try new foods that I have never tasted before.
	B	I order the dishes with which I am familiar so as to avoid disappointment and unpleasantness.
15	A	I enjoy looking at home movies, videos, DVDs, or travel slides.
	B	Looking at someone's home movies, videos, DVDs, or travel slides bores me tremendously.
16	A	I would like to take up the sport of water skiing.
	B	I would not like to take up water skiing.
17	A	I would like to try surfboard riding.
	B	I would not like to try surfboard riding.
18	A	I would like to take off on a trip with no preplanned or definite routes, or timetable.
	B	When I go on a trip, I like to plan my route and timetable fairly carefully.
19	A	I prefer the "down to earth" kinds of people as friends.
	B	I would like to make friends in some of the "far-out" groups like artists or "punks."
20	A	I would not like to learn to fly an airplane.
	B	I would like to learn to fly an airplane
21	A	I prefer the surface of the water to the depths.
	B	I would like to go scuba diving.
22	A	I would like to meet some persons who are homosexual (men or women).
	B	I stay away from anyone I suspect of being "gay" or "lesbian."
23	A	I would like to try parachute jumping.
	B	I would never want to try jumping out of a plane, with or without a parachute.
24	A	I prefer friends who are excitingly unpredictable.
	B	I prefer friends who are reliable and predictable.
25	A	I am not interested in experience for its own sake.
	B	I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.
26	A	The essence of good art is in its clarity, symmetry of form, and harmony of colors.
	B	I often find beauty in the "clashing" colors and irregular forms of modern paintings.
27	A	I enjoy spending time in the familiar surroundings of home.
	B	I get very restless if I have to stay around home for any length of time.
28	A	I like to dive off the high board.
	B	I don't like the feeling I get standing on the high board (or I don't go near it at all).
29	A	I like to date persons who are physically exciting.
	B	I like to date persons who share my values.
30	A	Heavy drinking usually ruins a party because some people get loud and boisterous.
	B	Keeping the drinks full is the key to a good party.

31	A	The worst social sin is to be rude.
	B	The worst social sin is to be a bore.
32	A	A person should have considerable sexual experience before marriage.
	B	It's better if two married persons begin their sexual experience with each other.
33	A	Even if I had the money, I would not care to associate with flighty rich persons in the "jet set."
	B	I could conceive of myself seeking pleasures around the world with the "jet set."
34	A	I like people who are sharp and witty, even if they do sometimes insult others.
	B	I dislike people who have their fun at the expense of hurting the feelings of others.
35	A	There is altogether too much portrayal of sex in movies.
	B	I enjoy watching many of the "sexy" scenes in movies.
36	A	I feel best after taking a couple of drinks.
	B	Something is wrong with people who need liquor to feel good.
37	A	People should dress according to some standard of taste, neatness, and style.
	B	People should dress in individual ways even if the effects are sometimes strange.
38	A	Sailing long distances in small sailing crafts is foolhardy.
	B	I would like to sail a long distance in a small but seaworthy sailing craft.
39	A	I have no patience with dull or boring persons.
	B	I find something interesting in almost every person I talk to.
40	A	Skiing down a high mountain slope is a good way to end up on crutches.
	B	I think I would enjoy the sensations of skiing very fast down a high mountain slope.

Appraisal Inventory 1

For each question, decide which sort of person you are most like – The one described on the right or the one described on the left. Then decide if that is "sort of true" or "really true" for you, and mark that choice. For each line mark only **ONE** of the four choices.

Really true of me	Sort of true of me				Sort of true of me	Really true of me
❑	❑	Some people go along with their friends just to keep their friends happy.	BUT	Other people refuse to go along with what their friends want to do, even though they know it will make their friends unhappy.	❑	❑
❑	❑	Some people think it is more important to be an individual than fit in with the crowds.	BUT	Other people think it is more important to fit in with the crowd than to stand out as an individual.	❑	❑
❑	❑	For some people, it's pretty easy for their friends to get them to change their mind	BUT	For other people, it's pretty hard for their friends to get them to change their mind.	❑	❑
❑	❑	Some people would do something that they know was wrong just to stay on their friends' good side.	BUT	For other people, it's pretty hard for their friends to get them to change their mind.	❑	❑
❑	❑	Some people hide their true opinion from their friends if they think their friends will make fun of them because of it.	BUT	Other people will say their true opinion in front of their friends, even if they know their friends will make fun of them because of it.	❑	❑
❑	❑	Some people will not break the law just because their friends say that they would.	BUT	Other people would break the law if their friends said that they would break it.	❑	❑
❑	❑	Some people change the way they act so much when they are with their friends that they wonder who they "really are."	BUT	Other people act the same way then they are alone as they do when they are with their friends.	❑	❑
❑	❑	Some people take more risks when they are with their friends than they do when they are alone.	BUT	Other people act just as risky when they are alone as when they are with their friends.	❑	❑
❑	❑	Some people say things they don't really believe because they think it will make their friends respect them more.	BUT	Other people would not say things they didn't really believe just to get their friends to respect them more.	❑	❑
❑	❑	Some people think it is better to be an individual even if people will be angry at you for going against the crowd.	BUT	Other people think it is better to go along with the crowd than to make people angry at you.	❑	❑

Appraisal Inventory 2

Please indicate how often the following statements apply to you by placing a check mark in the appropriate column from the scale below.

1	2	3	4	5
Almost never (0 to 10%)	Sometimes (11 to 35%)	About half the time (36 to 65%)	Most of the time (66 to 90%)	Almost always (91 to 100%)

Place a check mark in the column that applies to you	1	2	3	4	5
1. I am clear about my feelings.	❑	❑	❑	❑	❑
2. I pay attention to how I feel.	❑	❑	❑	❑	❑
3. I experience my emotions as overwhelming and out of control.	❑	❑	❑	❑	❑
4. I have no idea how I am feeling.	❑	❑	❑	❑	❑
5. I have difficulty making sense out of my feelings.	❑	❑	❑	❑	❑
6. I am attentive to my feelings.	❑	❑	❑	❑	❑
7. I know exactly how I am feeling.	❑	❑	❑	❑	❑
8. I care about what I am feeling.	❑	❑	❑	❑	❑
9. I am confused about how I feel.	❑	❑	❑	❑	❑
10. When I'm upset, I acknowledge my emotions.	❑	❑	❑	❑	❑
11. When I'm upset, I become angry with myself for feeling that way.	❑	❑	❑	❑	❑
12. When I'm upset, I become embarrassed for feeling that way.	❑	❑	❑	❑	❑
13. When I'm upset, I have difficulty getting work done.	❑	❑	❑	❑	❑
14. When I'm upset, I become out of control.	❑	❑	❑	❑	❑
15. When I'm upset, I believe that I will remain that way for a long time.	❑	❑	❑	❑	❑
16. When I'm upset, I believe that I'll end up feeling very depressed.	❑	❑	❑	❑	❑
17. When I'm upset, I believe that my feelings are valid and important.	❑	❑	❑	❑	❑
18. When I'm upset, I have difficulty focusing on other things.	❑	❑	❑	❑	❑
19. When I'm upset, I feel out of control.	❑	❑	❑	❑	❑
20. When I'm upset, I can still get things done.	❑	❑	❑	❑	❑
21. When I'm upset, I feel ashamed with myself for feeling that way.	❑	❑	❑	❑	❑
22. When I'm upset, I know that I can find a way to eventually feel better.	❑	❑	❑	❑	❑
23. When I'm upset, I feel like I am weak.	❑	❑	❑	❑	❑
24. When I'm upset, I feel like I can remain in control of my behaviors.	❑	❑	❑	❑	❑
25. When I'm upset, I feel guilty for feeing that way.	❑	❑	❑	❑	❑
26. When I'm upset, I have difficulty concentrating.	❑	❑	❑	❑	❑

1	2	3	4	5
Almost never (0 to 10%)	Sometimes (11 to 35%)	About half the time (36 to 65%)	Most of the time (66 to 90%)	Almost always (91 to 100%)

Place a check mark in the column that applies to you	1	2	3	4	5
27. When I'm upset, I have difficulty controlling my behaviors.	❑	❑	❑	❑	❑
28. When I'm upset, I believe that there is nothing I can do to make myself feel better.	❑	❑	❑	❑	❑
29. When I'm upset, I become irritated with myself for feeling that way.	❑	❑	❑	❑	❑
30. When I'm upset, I start to feel very bad about myself.	❑	❑	❑	❑	❑
31. When I'm upset, I believe that wallowing in it is all I can do.	❑	❑	❑	❑	❑
32. When I'm upset, I lose control over my behaviors.	❑	❑	❑	❑	❑
33. When I'm upset, I have difficulty thinking about anything else.	❑	❑	❑	❑	❑
34. When I'm upset, I take time to figure out what I'm really feeling.	❑	❑	❑	❑	❑
35. When I'm upset, it takes me a long time to feel better.	❑	❑	❑	❑	❑
36. When I'm upset, my emotions feel overwhelming.	❑	❑	❑	❑	❑

Appraisal Inventory 3

This questionnaire is designed to help get a better understanding of the kinds of things that can present challenges for students. Please rate how certain you are that you would in response to peer influence do the things describe by placing a check mark in the appropriate column.

Peer influence is the impression you have of what our peers do in regard to engaging in the following behaviors:

1	2	3	4	5
I would not resist	I am somewhat certain I would resist	I am moderately certain I would resist	I am reasonably certain I would resist	I am definitely certain I would resist

How confident are you that you would:	1	2	3	4	5
1. Resist peer influence to use marijuana.	❑	❑	❑	❑	❑
2. Resist peer influence to use any illegal drug(s).	❑	❑	❑	❑	❑
3. Resist peer influence to use any unprescribed prescription drug(s).	❑	❑	❑	❑	❑

Please answer either 4a or 4b using the following information
One drink equals: one ounce of alcohol (a shot or mixed drink), one 12 ounce beer, or one 6 ounce glass of wine

4a. **Men answer 4a**: Resist peer influence to drink 5 or more drinks within 4 hours or less than 4 hours	❑	❑	❑	❑	❑
4b. **Women answer 4b**: Resist peer influence to drink 4 or more drinks within 4 hours or less than four hours	❑	❑	❑	❑	❑
5. Resist peer influence to have sexual intercourse (oral, vaginal, anal intercourse) with a casual friend, someone you know, but not well.	❑	❑	❑	❑	❑
6. Resist peer influence to have sexual intercourse (oral, vaginal, anal intercourse) with a casual friend, someone you just met.	❑	❑	❑	❑	❑
7. Resist peer influence to use alcohol and/or other drugs before or during sexual intercourse.	❑	❑	❑	❑	❑
8. Resist peer influence to do without the use of protection against pregnancy and STDs during sexual intercourse in a monogamous relationship (an exclusive partner).	❑	❑	❑	❑	❑
9. Resist peer influence to do without the use of protection against pregnancy and STDs during sexual intercourse in a non-monogamous relationship (for example, with someone who is a "friend-with-benefits."	❑	❑	❑	❑	❑
10. Resist peer influence to do without the use of protection against pregnancy and STDs during sexual intercourse with someone you just met.	❑	❑	❑	❑	❑

Demographic Survey

Please respond to the following items as they relate to you. There are no right or wrong answers and all responses will be confidential.

Age

_____

Gender

- ❑ Male
- ❑ Female

Ethnicity

- ❑ African American
- ❑ American Indian/Alaska Native
- ❑ Asian/Pacific Islander
- ❑ European American/Caucasian
- ❑ Latino
- ❑ Middle Eastern
- ❑ Other _____

Are you….?

- ❑ Single
- ❑ Married
- ❑ Committed Relationship
- ❑ Divorced
- ❑ Widowed
- ❑ Other _____

Year in College

- ❑ Freshman
- ❑ Sophomore
- ❑ Junior
- ❑ Senior
- ❑ Other _____

Living Arrangements

- ❑ At home, with parents
- ❑ On campus in dorm
- ❑ Independently, off campus
- ❑ Other _____

Major

- ❑ Liberal Arts (specify _____
- ❑ Science (specify_____
- ❑ Other _____

Parents' Education (please check the appropriate column

Parent	Less than 7th grade	Junior high (9th grade)	Partial high school	High school graduate	Partial college	College Graduate	Graduate degree/ Professional training
Father							
Mother							

Parents' occupation (Please indicate what your parents do, not where they work; [e.g., doctor, not Beaumont Hospital]).

Father _____

Mother_____

APPENDIX B

RESEARCH INFORMATION SHEET

Title of Study: Personal and Social Factors in Risk taking Behaviors

Principal Investigator (PI): Katherine A. Roeser
Educational Psychology
(248) 496-6338

Purpose:
You are being asked to be in a research study examining the relation between a variety of human beliefs, choices, and behaviors in the areas of the use of alcohol, illegal drugs, and sexual activity. You are being asked to participate in the study because you are the group that the study is focusing on: undergraduate adult college students between 18 and 25 years of age. This study is being conducted at Wayne State University in undergraduate courses.

Study Procedures:
If you take part in the study, you will be asked to complete six surveys that have questions about your beliefs and behavior in the use of alcohol, drugs, and sexual activity and your perceptions of your peers' beliefs and behavior in the same areas. In addition, you will be asked questions about a variety of human traits, beliefs, and behaviors; including emotions, sense of self-efficacy, and interactions with friends. Questions will be asked such as, "I like to have new and exciting experiences and sensations even if they are a little unconventional or illegal. When I am upset, I feel out of control. Some people think it's more important to be an individual than to fit in with the crowd; but other people think it is more important to fit in with the crowd than to stand out as an individual. How confident are you that you can resist taking illegal drugs?" You are encouraged to respond to all the survey items, however, you are free to skip any items that you do not want to answer. The survey items have no right or wrong answers. Completion of the surveys is anticipated to take 20 to 30 minutes and you will be asked to complete them according to your own schedule. The researcher will ask you to return the survey packet to her in the original sealed envelope during this class one week later. No identifying information is placed on any of the survey material so your participation in the study is completely anonymous.

Benefits
As a participant in this research study, there will be no direct benefit for you; however, information from this study may benefit other people now or in the future.

Risks
There are no known risks at this time to participation in this study.

Costs
There will be no costs to you for participation in this research study.

Compensation
For taking part in this research study, you will be given a $5.00 gift card for your time and inconvenience.

Confidentiality
All information collected about you during the course of this study will be kept without any identifiers.

Voluntary Participation /Withdrawal:
Taking part in this study is voluntary. At any time prior to returning your completed surveys, you can change your mind about participating. Your decision will not change any present or future relationships with Wayne State University or its affiliates.

Questions:
If you have any questions about this study now or in the future, you may contact Katherine Roeser at the following phone number (248) 496-6338. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

Participation:
By completing the surveys in the packet, you are agreeing to participate in this study.

APPENDIX C

HUMAN INVESTIGATION COMMITTEE APPROVAL

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

FILE

NOTICE OF EXPEDITED APPROVAL

To: Katherine Roeser
College of Education

From: Dr. Scott Millis S. Millis, PhD /a.θ.
Chairperson, Behavioral Institutional Review Board (B3)

Date: July 01, 2011

RE: IRB #: 065011B3E
Protocol Title: Personal and Social Factors of Risk-Taking Behaviors in Emerging Adults
Funding Source:
Protocol #: 1106009835

Expiration Date: June 30, 2012

Risk Level / Category: Research not involving greater than minimal risk

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The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Expedited Review* Category (#7)* by the Chairperson/designee *for* the Wayne State University Institutional Review Board (B3) for the period of 07/01/2011 through 06/30/2012. This approval does not replace any departmental or other approvals that may be required.

- Revised Protocol Summary Form (received in the IRB Office 06/28/2011)
- Protocol (received in the IRB Office 06/01/2011)
- Research Information Sheet (dated 06/28/2011)
- Data Collection Tools: Demographic Survey, Cognitive Appraisal of Risky Events (CARE) Questionnaire for self, CARE-R Past Frequency Questionnaire for self, CARE Questionnaire for peers, CARE-R Past Frequency Questionnaire for peers, Resistance to Peer Influence Scale, Difficulty with Emotion Regulation Scale (DERS), Appraisal Inventory, Sensation Seeking Scale.

- Federal regulations require that all research be reviewed at least annually. You may receive a "*Continuation Renewal Reminder*" approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval *before* the expiration date. Data collected during a period of lapsed approval is unapproved research and can never be reported or published as research data.
- All changes or amendments to the above-referenced protocol require review and approval by the IRB **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the IRB Administration Office Policy (http://www.irb.wayne.edu/policies-human-research.php).

NOTE:

1. Upon notification of an impending regulatory site visit, audit notification, and/or external audit the IRB Administration Office must be contacted immediately.
2. Forms should be downloaded from the IRB website at each use.

*Based on the Expedited Review List revised November 1998

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ABSTRACT

PERSONAL AND SOCIAL FACTORS IN RISK TAKING BEHAVIORS OF EMERGING ADULTS

by

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The transitional period from adolescence to young adulthood is defined as the stage of life that begins at the conclusion of high school and ends with the acceptance of adult roles (i.e., career, marriage, parenthood). The focus of the present study was on college students' excessive use of alcohol and other drugs and participation in high-risk sexual activity and the association between those behaviors and personal and social factors such as sensation seeking, peer influence, perceived general resistance to peer influence, perceived self-efficacy to resist risky behavior, and emotion regulation.

The participants were 427 emerging- adult, undergraduate students 18 to 25 years of age (who were) enrolled in a large, Midwestern, urban university. The self-report surveys were distributed in classes, completed at home, and returned one week later. The Cognitive Appraisal of Risky Events-Revised (CARE-R) Sensation Seeking Scale (SSS-V)), Resistance to Peer Influence Scale (RPI), Difficulties in Emotion Regulation Scale (DERS) and A researcher-developed instrument was used to measure self-regulatory efficacy to resist peer influence to engage in risk taking behaviors associated with alcohol, drugs, and sex, and a short demographic survey.

Statistically significant results were obtained on the stepwise multiple linear regression analyses for risky sex, drug, and alcohol behaviors. Perceived peer risky behaviors, self-efficacy, and sensation seeking were statistically significant predictors of the three risky behaviors. Self-efficacy was partially mediating the relation between sensation seeking and risky sex, drug, and alcohol behaviors and between perceived peer risk taking behaviors and risky sex, drug, and alcohol behaviors.

Based on the findings of the study, it appears that self-efficacy to resist risky behaviors was the most important variable in controlling emerging adults' involvement in risky behaviors. Sensation seeking also was important, as was perceptions of their peers' involvement in these behaviors. Additional research is needed to determine if these variables are consistent in a noncollege emerging adult population.

AUTOBIOGRAPHICAL STATEMENT

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