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Associations among Desirability of First Sexual Experience, Sexual Risk-Taking Behaviors and Attitudes, and Substance Use in Justice-Involved Male Adolescents

Ryan S. Ross

Ryan Ross

Candidate

Psychology

Department

This thesis is approved, and it is acceptable in quality and form for publication:

Approved by the Thesis Committee:

Dr. Elizabeth Yeater   , Chairperson

Dr. Angela Bryan

Dr. Katie Witkiewitz

ASSOCIATIONS AMONG DESIRABILITY OF FIRST SEXUAL EXPERIENCE, SEXUAL RISK-TAKING BEHAVIORS AND ATTITUDES, AND SUSTANCE USE IN JUSTICE-INVOLVED MALE ADOLESCENTS

by

RYAN SKYE ROSS

B.S. PSYCHOLOGY, 2007-2012
B.A. SOCIOLOGY, 2007-2012
UNIVERSITY OF NEW MEXICO

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Ryan S. Ross

B.S., Psychology, University of New Mexico, 2012

B.A., Sociology, University of New Mexico, 2012

M.S., Psychology, University of New Mexico. 2018

ABSTRACT

Justice-involved adolescents are particularly vulnerable to engaging in risky sex and developing substance use disorders. Given these negative sequelae, identifying risk factors that place these adolescents at increased risk and potentially influence changes over time is important. Data from 347 justice-involved male adolescents was used for the current study. Participants completed baseline assessments of adverse childhood experiences, impulsivity, sociosexuality, substance use histories, and sexual histories, as well as 3, 6, 9, and 12-month assessments of sexual risk taking and alcohol/marijuana problems.

Structural equational modeling (SEM) was used to examine the influence of impulsivity, adverse childhood experiences, and desirability of first sexual encounter on sexual risk taking and substance use at baseline assessment. More adverse childhood experiences and higher impulsivity were associated with higher levels of substance use; and greater desirability of first sexual encounter and higher impulsivity were associated with more sexual risk taking. A parallel process latent growth model was also estimated

to examine longitudinal relationships among risky sex and alcohol/marijuana problems, and impulsivity, sociosexuality, adverse childhood experiences, and desirability. Results revealed that more adverse childhood experiences, higher levels of sociosexuality, and higher impulsivity were associated with more alcohol and marijuana problems at 3-month assessment. Desirability was not associated with either risky sex or alcohol/marijuana problems across time. An association was found between impulsivity and the linear slope of alcohol/marijuana problems, suggesting that extreme levels of impulsivity may account for a significantly slower increase in substance problems over time. Implications for future research and interventions for this vulnerable population are discussed.

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Chapter 1

Introduction

Traditionally, dating begins during puberty as a way for adolescents to explore romantic, social, and sexual relationships. However, intimate partner violence (IPV) is a common experience for many adolescents, an experience that has lifelong consequences, as well as an immediate psychological and physical health impact (Breiding, Basile, Smith, Black, & Mahendra, 2015). Intimate partner violence is best defined as physical violence, sexual violence, stalking, and psychological aggression, including the use of coercive tactics by a current or former partner, such as spouses, boyfriends/girlfriends, dating partners, or ongoing sexual partners (Breiding, Basile, Smith, Black, & Mahendra, 2015).

Unfortunately, epidemiological studies suggest that IPV is relatively common among adolescents. The 2010 National Intimate Partner and Sexual Violence Survey found that 69% of female victims and 53% of male victims who experienced physical or sexual violence, and/or stalking by an intimate partner reported some form of IPV starting before the age of 25 (Black et al., 2011). Additionally, data analysis from the National Longitudinal Study of Adolescent Health of 4134 adolescents found that 8.3% of respondents reported experiencing intimate partner victimization during adolescence in relationships that began and ended before the age of 18, and 7.2% reported persistent victimization that continued throughout adolescence into young adulthood (Halpern, Spriggs, Martin, & Kupper, 2009).

Intimate partner violence has been linked to several negative mental health outcomes for women (Pico-Alfonso et al., 2006; Campbell, 2002), including posttraumatic stress disorder (Nixon, Resick, & Nishith, 2004; Silva, Mcfarlane, Soeken, Parker, & Reel, 1997), depression (Filson, Ulloa, Runfola, & Hokoda, 2010), and suicidal behavior (Golding, 1999). However,

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there exists a relative dearth of data on men's IPV experiences, including the consequences of these experiences, making this an area worthy of empirical investigation. The few studies that have examined health consequences of IPV for both men and women have found that this violence is associated with an increase in alcohol and drug use (Coker et al., 2002) and depression (Ulloa & Hammett, 2016). Moreover, research focusing solely on male victims has found that intimate partner violence is associated with posttraumatic stress symptomatology (Hines, 2007) and risky sexual practices, such as having unprotected sexual intercourse (Howard, Wang, & Yan, 2008).

In general, women are more likely to experience intimate partner violence than men; 28.9% compared to 22.9%, respectively (Coker et al., 2002). As such, the majority of studies examining IPV have focused on women as victims, and only a handful have examined the victimization experiences of men (Ulloa & Hammett, 2016). Nonetheless, a comprehensive review of 249 articles conducted by Desmarais, Reeves, Nicholls, Telford, & Fiebert (2012) showed that approximately one in five men experience physical IPV, defined as experiencing physical violence in an intimate relationship at least once in their lifetime. Dutton, Nicholls, and Spidel (2005) proposed that female-perpetrated intimate partner violence is less likely to be seen as a crime, and this may be related to why men are less likely to report IPV than women, despite similar prevalence rates. Men and women are more likely to be sexually coerced by someone that they have a personal relationship with, and the sexual coercion is more likely to occur in the context of a heterosexual dating relationship (Hartwick, Desmarais, & Hennig, 2007; O'Sullivan, Byers, & Finkleman, 1998), making the vast majority of sexual assaults involving male victim incidences of intimate partner violence.

As noted in Yeater, Lenberg, and Byran (2012), adolescents between the ages of 12-17 report rates of sexual assault twice that of adults (Snyder & Sickmund, 1999) and account for 33% of sexual assault victims (Snyder, 2000). As with research on adult populations, the majority of findings on the physical, social, and psychological consequences associated with sexual assault in adolescence and early adulthood is drawn mainly from samples of young women. Notably, exposure to sexual trauma may lead to risk-taking behaviors during adolescence and young adulthood. For instance, researchers have found an association between delinquent behaviors and violent victimization, including sexual assault (Jackson, Hanson, Amstadter, Saunders, and Kilpatrick, 2013; Yeater, Montanaro, and Bryan, 2015). Combining data from the 2009 and 2011 National Youth Risk Behavior Surveys (12,256 male respondents), Anderson, Hayden, and Tomasula (2015) also found a relationship between self-reported sexual assault histories and suicide attempts, with 33% of males with sexual assault histories attempting suicide in the last 12 months.

Male Victims of Sexual Assault

Historically speaking, legal definitions of sexual assault, which are determined at the state level, were restricted to female victims who were assaulted by male perpetrators (Horney & Spohn, 1991), and thus, according to the criminal justice system, adult male victims of sexual assault were nonexistent. It was not until many states passed "reform statutes rape" laws that legal definitions in the United States were not gender biased (Koss, 1992). For example, it was not until January of 2013 that a revised definition of rape for the Uniform Crime Reporting Program's Summary Reporting System went into effect. Specifically, the definition was changed from "The carnal knowledge of a female forcibly and against her will" (U.S. Department of Justice, 2014b) to "Penetration, no matter how slight, of the vagina or anus with any body part or

object, or oral penetration by a sex organ of another person, without the consent of the victim"

(U.S. Department of Justice, 2014a).

The majority of research on the sexual victimization of men primarily focuses on child

sexual abuse experiences (Peterson, Voller, Polusny & Murdoch; 2011). At present, there is only

limited research on male victims of adult sexual assault. Rogers (1998) estimated that the

research, support systems, and help for male victims of sexual violence is 20 years behind that of

female victims. Furthermore, until recently, the majority of research definitions of sexual assault

paralleled legal definitions, and therefore, statistics on male victims tended to only include male-

to-male sexual assault (Fisher & Pina, 2012). More recent definitions of male sexual

victimization vary between studies, but the most common definition is an experience of being

"pressured or forced" by another person to have contact including kissing, touching of sexual

parts or sexual intercourse – oral, anal or vaginal (Struckman-Johnson & Struckman-Johnson,

1994).

In the last few years, current literature has broadened the definition of sexual coercion to

include being taken advantage of in an incapacitated state and the use of psychological coercion

to obtain sexual contact (Judson, Johnson, & Perez, 2013). However, a number of problems

make it difficult to estimate prevalence rates of sexual coercion among men, including

definitions for unwanted sexual experiences, different time frame used in studies (e.g., since the

age of 14 or since the age of 16), and other factors related to the survivor's willingness to

disclose sexual assault information to researchers (Banyard et al., 2007). Artime, McCallum, &

Peterson (2014) proposed that it is likely that a large percentage of men who have experienced

events that would qualify as sexual assault do not label such events as sexual abuse or rape.

Furthermore, studies differ in the terminology they use to refer to rape, ranging from sexual

assault, sexual abuse, sexual violence, sexual aggression or sexual coercion, depending on the conceptualization of unwanted sexual activity that is being examined (Williams et al, 2014).

        Research studies involving male victims of sexual assault. O'Sullivan, Byers, & Finkleman (1998) found that 18.5% of Canadian undergraduate and graduate men reported experiencing sexual coercion in the last year, with sexual coercion being defined as experiencing pressure or force from a person in order to engage in unwanted sexual activity. O'Sullivan, Byers, and Fickleman (1998) also inquired about men's emotional reactions to experiences of sexual coercion and found that 20% of the men who reported experiences of sexual coercion endorsed that the incident decreased their involvement in social activities, and 19.0% reported impairment in their academic functioning. Larimer, Lydum, Anderson, & Turner (1999) found that 20.7% of male undergraduate participants reported one or more types of unwanted sexual contact, as measured by a modified gender-neutral version of the Sexual Experiences Survey (SES). This modified version included five categories of unwanted sexual contact which included: *unwanted sexual contact,* defined as being in a situation where your partner became so sexually aroused that you felt it was useless to stop them even though you did not want to have sexual intercourse, *pressured sexual contact,* defined as having had sexual intercourse with someone when you didn't really want to because you felt pressured by their continual arguments, *physical force,* defined as a situation where someone used some degree of physical force to get you to have sexual intercourse with them when you didn't want to, whether or not intercourse actually occurred, *attempted sexual contact with drugs/alcohol,* defined as having someone attempt sexual intercourse with you by giving you alcohol or other drugs, but intercourse did not occur, and *sex-drug/alcohol,* defined as having had sexual intercourse when you didn't want to because a person gave you alcohol or other drugs. Men who had experienced one or more

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incidents of any category of unwanted sexual contact reported heavier alcohol use, more alcohol related consequences, and more symptoms of depression when compared to other men who had not experienced unwanted sexual coercion (Larimer et al., 1999).

Banyard et al. (2007) found that 8.2% of undergraduate men reported experiencing unwanted sexual contact in the last 6 months. Sexual contact was defined as attempted or actual kissing, fondling, or touching someone in a sexual or intimate way, excluding sexual intercourse; while "situations in which you were certain at the time that you did not want to engage in the sexual experience and you either communicated this in some way, you were intimidated or forced by someone, or you were incapacitated" was used to identify unwanted contact. Men reported negative consequences in the aftermath of the unwanted contact and low levels of disclosure of their unwanted sexual experiences relative to women with similar experiences who also participated in the study.

Palmer, McMahon, Rounsaville, & Ball (2010) found that 31% of college men ($n = 55$) and 34% of college women ($n = 67$) had experienced unwanted sexual contact in the past year. This study used an adapted version of the SES (Koss & Oros, 1982) to define unwanted sexual contact, which asked participants to report on sexual experiences/activity in the past year that involved some degree of coercion or force. Sexual activity was defined as "physical behaviors ranging from touching to intercourse." A chi-square analysis on participant gender and unwanted sexual contact found no significant association between men and women with respect to reporting unwanted sexual contact. Male and female victims of unwanted sexual contact, as compared to non-victims, endorsed consuming more alcohol, had greater alcohol expectancies, experienced more alcohol-related consequences, and used fewer protective behavioral strategies

as defined as specific safety strategies (e.g. 'avoid drinking games,' 'use protection with a sexual partner,' 'have a plan with a friend to watch out for each other') prior to and during drinking.

In another study of the coercive experiences of high school male adolescents and college men, French, Tilghman, & Malebranche, (2015) collected open-ended responses on the Coping Strategies Inventory, in which participants were asked to write a summary of an incident when they were sexually coerced, or, if they had not experienced sexual coercion, they were asked to write about a time when they were coerced or pressured into doing something that they did not want to do. These responses were then coded by the authors, and it was found that 20% of participants described a sexually coercive event. Men who described a coercive event reported greater sexual risk taking and alcohol use. Moreover, French, Tilghman, & Malebranche (2015) found that men whose sexual coercion experiences resulted in sexual intercourse reported higher levels of alcohol use and sexual risk taking when compared to participants who had not experienced sexual coercion or had sexual coercion experiences that involved fondling or attempted but not completed intercourse.

Turchik (2012) found that 51.2% ($n = 153$) of male undergraduate respondents reported at least one experience of sexual victimization since the age of 16 as measured by the Sexual Coercion Tactics Scale (SCTS; Struckman-Johnson, Struckman-Johnson, & Anderson, 2003). Male victimization in this study included victimization by both male and female perpetrators, and victimization was broken down into four categories: no victimization (48.8%, $n = 146$), unwanted sexual contact (21.7%, $n = 65$), which included 15 items such as engaged in unwanted sexual behavior (kissing, fondling, petting) but not sex with someone because he or she tried to talk you into it repeatedly, sexual coercion (12.4%, $n = 37$), which included 8 items such as engaged in unwanted oral, vaginal, or anal sex with someone because he or she threatened to

break up with you, and completed rape (17.1%, $n = 51$), which included 7 items such as engaged in unwanted oral, vaginal, or anal sex with someone because he or she blocked your retreat. Consistent with previous literature on adult male victims (Larimer, Lydum, Anderson, & Turner, 1999; Palmer, McMahon, Rounsaville, & Ball, 2010), Turchik (2012) found that college men who reported any sexual victimization, relative to nonvictimized men, reported greater weekly alcohol use, more problematic drinking behaviors (e.g., getting sick after drinking, getting a DWI from drinking and driving), and overall greater sexual risk taking (e.g., risky sexual acts, sexual risk taking with uncommitted partners). Furthermore, more severe experiences of sexual victimization were associated with greater sexual risk taking with uncommitted partners, impulsive sexual behaviors, and intent to engage in risky sexual behaviors.

While sexual victimization experiences among men appear to be linked to sexual risk taking and substance use, factors other than victimization also appear to be associated with these behaviors. A review of these factors follows.

Adolescent Risk Factors for Substance Use and Sexual Risk Taking

Early sexual experience. Early sexual activity has been found to be a predictor of sexual risk taking, in that early age of first sexual intercourse has been associated with unprotected sexual intercourse (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997; Smith, 1997), more sexually transmitted diseases (Smith, 1997; Greenberg, Magder, & Aral, 1992) including risk of contracting HIV (Dixon-Mueller, 2009), binge drinking in young adulthood (Holway, Tillman, & Brewster, 2017) and higher numbers of sexual partners in young women (Smith, 1997). Studies examining the factors related to early sexual initiation often ignore the possibility that sexual initiation could be coerced (Marín, Coyle, Gómez, Carvajal, & Kirby, 2000). The National Survey of Family Growth found that 22% of young women whose first sexual experience

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occurred before age 15 years reported their initiation as non-voluntary (Abma, Chandra, Mosher, Peterson, & Piccinino, 1997), and when asked to rate the "wantedness" of first intercourse, 24% of women aged 13 years or younger at the time of their first intercourse reported the experience to have been non-voluntary, compared to only 10% of those who were 19–24 years old at time of sexual initiation (Abma, Driscoll, & Moore,1998). To the best of the author's knowledge, no studies have been conducted that have examined the desirability of first sexual experience in a sample of male justice-involved adolescents.

  Adverse Childhood Experiences. Adverse childhood experience(s) is a term often used to describe a range of negative life events experienced by children and adolescents, including physical, psychological, and sexual mistreatment, as well as negative home environments. Adverse experiences in childhood and adolescence have been found to be significantly associated with substance use in adolescents (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001), and another form of adverse childhood experiences, familial conflict, has been found to be associated with the risk of substance use disorders in adolescents (Skeer, McCormick, Normand, Buka, & Gilman, 2009). Examining adverse childhood experiences of women prospectively, Klein, Elifson, & Sterk (2007) found that adult women who had been neglected in childhood and adolescence endorsed more negative attitudes toward using condoms than non-neglected women. Dube et al. (2005) reported a 30% increased risk of alcohol problems for men who reported child sexual assault, and a 50% increased risk of using illicit drugs for men who reported child sexual assault, relative to men who reported no childhood sexual abuse. These results are not limited to studies conducted in the United States; in a study of adults in the Philippines, Ramiro, Madrid, & Brown (2010) found the odds of using illicit drugs and engaging in sexually risky behaviors increased as the number of adverse events experienced increased to four or more events.

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Sociosexuality. An individual's preference to engage in uncommitted sexual relationships is commonly referred to as sociosexuality (Penke & Asendorpf, 2008). Sociosexuality may be a critical trait that is associated with sexual activity, relationship status, and drinking behaviors (Corbin, Scott, & Treat, 2016). Velez-Blasini (2008) found that individuals who reported engaging in higher risk behaviors, as defined as engaging in sexual intercourse during a sexual encounter with a causal partner, have been found to score higher on measure of sociosexuality when compared to a comparison subset of the research sample (Velez-Blasini, 2008). Additionally, Corbin et al. (2016) found evidence to support an indirect effect of sociosexuality on alcohol use through sexual behavior for both men and women, as well as a direct effect of sociosexual attitudes on increased alcohol use for men.

Impulsivity. The personality trait, impulsive sensation seeking, describes the tendency to act quickly without thinking, as well as a preference for novelty and change (Zuckerman, 2002). Donohew et al. (2000) found an association between impulsive sensation seeking and risky sexual behaviors among adolescents, including using alcohol before having sexual intercourse. Impulsive sensation seeking also has been found to be associated with adolescent substance use including alcohol, tobacco and cannabis use, as well as heavy drinking in Spain (Fernández-Artamendi, Martínez-Loredo, Fernández-Hermida, & Carballo-Crespo, 2016).

High-Risk Nature of Juvenile Offenders

While recent studies have advanced our understanding of adolescents as victims of sexual assault, one population that has received little attention in the extant literature is juvenile offenders. The literature suggests that delinquent youths are particularly vulnerable to substance use disorders, alcohol abuse, suicidal behaviors, and sexually risky behaviors (Pinto, Fernandes, Mesquita, & Maia, 2015; Yeater, Lenberg, & Bryan, 2012; Welte, Barnes, Hoffman, Wieczorek,

& Zhang, 2005). Yeater, Lenberg, & Bryan (2012) provided evidence that delinquent youth may be especially vulnerable to engaging in high-risk sexual behaviors such as earlier sexual encounters, a greater number of sexual partners, lower rates of condom use, and higher rates of sexually transmitted diseases. In a study of delinquent male adolescents, Welte, Barnes, Hoffman, Wieczorek, & Zhang (2005) found that alcohol use predicted the degree of delinquent behaviors that an adolescent engaged in early in the adolescent's delinquent careers. Welte et al. (2005) also found that greater drug and alcohol dependency and consequences were associated with higher peak levels of delinquent behaviors. Furthermore, the authors found an inverse relationship between frequency of drug use and the rate of maturing out of delinquency, with adolescents who were more frequently using substances maturing out of delinquency slower than adolescents who use substances less frequently.

One theoretical framework used to explain the relationship between sexual victimization and substance use in adolescents is coping theory. Coping theory posits that adolescents will engage in high-risk behaviors in an attempt to manage the negative psychological consequences of sexual victimization (Lazarus 1993). There is some evidence for the support of the coping theory in that victimization experiences might result in delinquent behavior for female juvenile offenders. In a longitudinal study of 245 female juvenile offenders, Yeater, Montanaro, and Bryan (2015) found that after controlling for other correlates, sexual coercion reported at a 6-month follow-up predicted alcohol use at 24-month follow-up. This finding supports the notion that sexual coercion is associated with subsequent increases in alcohol use and suggests that female juvenile offenders may increase their alcohol use to cope with their victimization experiences. Furthermore, additional analyses revealed that participants who reported victimization at 6-month follow-up were 1.27 times more likely to report further victimization at

24-month follow-up for each increase in alcohol use at 6-month follow up. This study suggests the possibility of a bidirectional relationship between alcohol use and sexual victimization, in that initial sexual victimization may increase the likelihood of alcohol use, which in turn, might increase the likelihood of future sexual victimization.

Overview of the Current Study

Participants were recruited for a longitudinal randomized clinical trial (N = 460) evaluating a multi-behavioral intervention to reduce sexually risky behaviors among justice-involved adolescents (Callahan, Montanaro, Magnan, & Bryan, 2013). Only male participants were eligible for inclusion in the current study analyses (*n* =347). The mean age of participants was 15.81 (SD = 1.13; range: 14-18). Most participants reported their ethnicity as Hispanic/Latino (66.9%, n = 232) while the vast majority of remainder of the sample endorsed White/Caucasian (22.5%, n = 78). Participants were recruited by research assistants visiting the Bernalillo County Detention Center, located in Albuquerque, New Mexico, who announced the opportunity to participate in the study. Eligible participants were between the ages of 14-18, could speak and read English, had a remaining term in the detention center of less than 1 month, and were willing to sign a release form allowing access to STI test results taken at intake. In addition to informed assent by the participant, parental/guardian consent was obtained via telephone by a research assistant for all participants under the age of 18. Participants then completed a battery of self-report assessments at baseline, post-treatment, and again at 3-month, 6-month, 9-month, and 12-month follow-up appointment.

A subset of measures were selected for the analyses as indicators of two latent variables, called "sexual risk-taking behaviors and attitudes", and "substance use", which are posited to capture significant behavioral and health risks for these adolescents. Measures tapping factors

thought to be predict these latent variables also were selected from the larger dataset. Details regarding the specific data analytic strategy is discussed further below.

Goals of the Study

The goals of the current study were (a) to evaluate the relationships among desirability of first sexual experience, sociosexuality, adverse childhood experiences, and impulsivity at baseline and sexual risk taking behaviors and attitudes (measured by condom benefits, condom attitudes, condom intentions, lifetime sexual partners, lifetime use of condoms during sexual intercourse, lifetime sex occurring while under the influence of marijuana, and lifetime sex occurring under the influence of alcohol) and substance use (measured by AUDIT total scores, alcohol problems, marijuana problems, marijuana dependency, and illicit substance use history) at baseline assessment; (b) to examine whether desirability of first sexual experience, sociosexuality, adverse childhood experiences, and impulsivity predicted changes in two key variables of sexual risk taking (i.e., a sexual risk-taking composite variable) and substance use over time (i.e., alcohol/marijuana problems) over time (baseline, 3, 6, 9, and 12-month assessment).

Specific Hypotheses

It was expected that (a) desirability of first sexual experience would be associated negatively with sexual risk-taking behaviors and attitudes and substance use, such that wanting this experience less would be associated with greater sexual risk-taking behaviors and attitudes and substance use at baseline; (b) greater sociosexuality and impulsivity, as well as more adverse childhood experiences, would be associated positively with sexual risk-taking behaviors and attitudes and substance use as measured at baseline; (c) desirability of first sexual experience would be associated negatively with changes in the key variables for sexual risk taking and

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substance use (baseline, 3, 6, 9, and 12-month assessment), such that wanting this experience less would be associated with increases in sexual risk taking and substance use over time; and (d) sociosexuality, impulsivity, and adverse childhood experiences would be positively associated with changes in sexual risk taking and substance use (baseline, 3-month, 6-month, 9-month and 12-month assessment), such that higher sociosexuality, greater impulsivity and more adverse childhood experiences would be associated with increases of sexual risk taking and substance use over time.

Chapter 2

Methods

Participant Information

Demographic Questionnaire (Appendix A). A demographic questionnaire was used to collect participant information on age, sex, and race/ethnicity.

Intervention Condition. As this data was collected as part of a randomized clinical trial of a multi-behavioral intervention, it was critical to take into account the intervention condition participants received when examining the longitudinal trajectories. The interventions used in the original study were coded based on the inclusive nature of each condition; with a 0 indicating the "sex only" intervention, 1 indicating the "alcohol + sex" intervention, and 2 indicating the "alcohol + marijuana + sex" intervention. This variable was included to examine the relationship between participant's randomly assigned condition and changes in the key variables for sexual risk taking and substance use over time.

Sexual Risk Taking Measures

Sexual History (Appendix B). The measures of sexual behavior were culled from various sources, including Bryan and colleagues work with incarcerated adolescents (e.g., Robbins & Bryan, 2004). Participants were first asked whether they had ever had sexual intercourse (yes/no). Participants who have never had sexual intercourse were directed to the next section of the survey. Participants who endorsed having sexual intercourse answered questions about their sexual history, such as how old they were the first time they had sexual intercourse, how many sexual partners they have had, and the average overall frequency of sexual intercourse. Participants were asked how often they used condoms and how often they have used contraception since being sexually active. Participants also were asked to estimate, over their

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lifetime, "How much of the time have you been using alcohol when you've had sexual intercourse?" and "How much of the time have you been using marijuana when you've had sexual intercourse?" Response options range from "Never" to Always" on a five-point scale. For the purposes of this study, the following questions from participant's sexual histories were of interest: desirability of first sexual experience, number of lifetime sexual partners, lifetime sex using condoms, lifetime sex occurring while under the influence of marijuana, and lifetime sex occurring under the influence of alcohol.

Condom Benefits (Robbins & Bryan, 2004) (Appendix C). Condom Benefits is a seven-item questionnaire that asks participants to report on their attitudes towards condom use, attitudes towards different risks regarding sex, and beliefs of condoms in addressing different risks (e.g, condom use would be a good thing for me to do if I was sexually active). Response options range from "Disagree a lot" to "Agree a lot" on a four-point scale. Condom benefits was included as an indicator variable for Sexual Risk-Taking Behaviors and Attitudes.

Condom Attitudes (Appendix D). Condom attitudes is a 23-item modified version of Sacco's Condom Attitudes Scale (Sacco, Levine, Reed & Thompson, 1991) that asked participants to report on their general attitudes towards condom use such as "condoms take away the pleasure of sex" and "if my partner suggested condoms I would feel relieved." The Condom Attitudes Scale has been modified for use with adolescent populations (St. Lawrence, Reitman, Jefferson, Alleyne, Brasfield, & Shirley,1994) and was found to have a full scale Cronbach's α = 0.80. In the current study, the internal consistency of the condom attitudes measure was Cronbach's α = 0.68. Response options range from "Very Bad" to "Very Good" on a seven-point scale. Condom attitudes was included as an indicator variable for the Sexual Risk-Taking Behaviors and Attitudes latent variable.

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Condom Intentions (Robbins & Bryan, 2004) (Appendix E). Participant's future intentions to use condoms were measured using items based on a pool developed by Byran and colleagues in previous research on justice-involved adolescents (Robbins & Bryan, 2004). Some items pertain to the likelihood of participants engaging in behaviors with regards to condom purchasing/use (e.g., How likely is it that you will buy or get condoms in the next three months?), while other questions inquire about the likelihood of condom-related behaviors while the participant is under the influence of alcohol or marijuana (e.g., How likely is it that you would use a condom when you have been drinking alcohol?). Responses options range from "Will NOT happen" to "Will DEFINITELY happen" on a four-point scale. In the current study, the internal consistency of the condom intentions measure was Cronbach's $\alpha = 0.95$. Condom intentions was included as an indicator variable for the Sexual Risk-Taking Behaviors and Attitudes latent variable.

Risky Sex Composite. The risky sex composite variable was calculated using participant's last 3-month frequency of sex and frequency of condom use in the last 3 months. Participants who reported that they never had sex were assigned a score of 0, which reflected no sexual risk-taking. This variable was calculated for baseline, 3-month, 6-month, 9-month, and 12-month follow-up. Risky Sex was included as the key variable for Sexual Risk Taking in the latent growth model. This composite was developed and implemented by Byran and colleagues in previous research on justice-involved adolescents (Schmiege, Broaddus, Levin, & Bryan, 2009; Gillman, Yeater, Ewing, Kong, & Bryan, 2017).

Substance Use Measures

Substance Use History Questionnaire (SUH; Robbins & Bryan, 2004) (Appendix F). Use of illicit substances use (prescription drugs, methamphetamine, etc**.**) was assessed by a

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measure used by Bryan and colleagues in her research with adolescents (Robbins & Bryan, 2004). Participants were asked (a) have they used a specific substance; (b) how old they were when they first used the substance; (c) how many years they have used the substance; and (d) how often they have used the substance in the last 3 months. Responses were scored by summing the total number of substances used by participants and was included as an indicator variable for the Substance Use latent variable.

Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989) (Appendix G).
The RAPI is a 23-item questionnaire developed specifically to evaluate alcohol-related problems of adolescents. The RAPI has high internal consistency, with $\alpha = .92$ in a sample of adolescents from 12 to 21 and has been found to correlate moderately with measures of alcohol use frequency and quantity (White & Labouvie, 1989). In the current study, the internal consistency of the RAPI was Cronbach's $\alpha = 0.95$. Responses to items on the RAPI were summed to form a global alcohol problem score, and this value was used as an indicator variable for the Substance Use latent variable.

Alcohol Use Disorders Identification Test (AUDIT) (Appendix H). The AUDIT is a 10-item self-report measure developed to measure hazardous drinking, including alcohol dependence. A review of the AUDIT found that it had good sensitivity and specificity to lifetime alcohol dependence, and the reliability was typically high as well (Allen, Litten, Fertig, & Babor, 1997). The internal consistency of the AUDIT for this study was Cronbach's $\alpha = 0.86$. AUDIT scores were summed to create an overall AUDIT total, and this score was used as an indicator variable for the Substance Use latent variable.

Marijuana problems (RDPI; Johnson & White, 1995) (Appendix I). An adapted version of the RAPI was used to assess problems around marijuana use. Items on the RDPI

asked about problems specific to marijuana use and parallel items on the traditional RAPI (e.g., How many times did the following things happen to you while you were smoking marijuana or because of your marijuana use?). The RDPI has been shown to have good reliability ($\alpha = 0.83$), and the internal consistency of the RDPI in the current study was Cronbach's $\alpha = 0.83$. Scores on the RDPI were summed to create an overall marijuana problems variable, and this variable served as an indicator variable for the Substance Use latent variable.

Marijuana Dependence Scale (MDS; Stephens, Roffman, & Curtin, 2000) (Appendix J). The Marijuana Dependency Scale is a 10-item measure based on DSM IV criteria for marijuana dependency. Items on the MDS include questions such as "feeling what might be described as a withdraw symptom" and "giving up or reducing important social or work-related activities in order to smoke marijuana." Participants answered each dependence item with either a "yes" or a "no," and the measurement items were summed to form the scale. The MDS was included as an indicator variable for the Substance Use latent variable.

Alcohol/Marijuana Problems. Alcohol/Marijuana Problems is a composite variable calculated by summing a participant's RAPI and RDPI scores. Given the high bivariate correlation between RAPI and RDPI scores, it was determined that this composite variable was more appropriate for the current analyses. Scores of Alcohol/Marijuana Problems served as an indicator variable for the Substance Use latent variable in the structural equation modeling, and as the key variable for Substance Use in the latent growth model.

Predictors of Sexual Risk Taking Behaviors and Attitudes and Substance Use

Impulsive Sensation Seeking Scale (ImpSS; Zuckerman, 2002) (Appendix K). The impulsive sensation seeking scale (ImpSS) is a subscale from the Zuckerman-Kuhlman Personality Questionnaire (Zuckerman, 2002). The scale consists of nineteen questions that ask

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participants about their feelings regarding impulsive decision making. An example item included in this measure is "I like wild and uninhibited parties." The ImpSS has shown good reliability with Cronbach's α ranging between 0.84 and 0.87 (McDaniel & Mahan, 2008). Furthermore, McDaniel and Mahan (2008) found that the ImpSS demonstrated good concurrent validity, as highlighted by the correlation between the ImpSS and the Sensation Seeking Scale – Form V, another sensation seeking measure. In the current study, the internal consistency of the ImpSS was Cronbach's α = 0.70. This measure was included to examine the relationship between impulsivity and the latent factors in the structural equational model, as well as changes in the key variables for sexual risk taking and substance use over time.

The Early Life Stress Questionnaire (ELSQ; McFarlane et al., 2005; Paul et al., 2005) (Appendix L). The early life stress questionnaire (ELSQ) is a self-report measure of the occurrence of potential adverse childhood experiences. The ELSQ is based on the Child Abuse and Trauma Scale (CAT; Sanders and Becker-Lausen, 1995), which has shown strong internal consistency (α = 0.90), and test-retest reliability ($t = .89$, $p < .001$). The CAT also has shown predictive validity, as demonstrated by correlations among responses to the CAT and symptoms of adult psychopathology and other negative life outcomes. The ELSQ consists of twenty adverse childhood experiences, shown to be either traumatic or extremely stressful in previous research (De Bellis, 2001), and participants indicate if specific experiences occurred in their lifetime. An example of an item on the ELSQ is "(I have) had one of your parents, a brother or sister experience a life-threatening illness." Overall, self-reports of adverse childhood experiences have been considered valid, as adolescent versions of these measures have been found to have high agreement with agency estimates of childhood trauma such as physical and sexual abuse, 73.1% and 88.1% respectively (McGee, Wolfe, Yuen, Wilson, & Carnochan,

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1995). In the current study, the internal consistency of the ELSQ was Cronbach's α = 0.81. This measure was included to explore the relationship between adverse events and the latent factors in the structural equational model, as well as changes in the key variables for sexual risk taking and substance use over time.

Sociosexuality Orientation Inventory (SOI-R; Penke & Asendorpf, 2008) (Appendix M). The SOI-R is a 9-item self-report measure used to assess participants' sexual attitudes and their willingness to engage in sexual activity. Higher scores on the SOI-R are indicative of greater acceptance of liberal sexual beliefs and behaviors. An example item on the SOI-R is "How often do you experience sexual arousal when you are in contact with someone with whom you do not have a committed romantic relationship?" Participants indicated on a 9-point Likert scale, ranging from 1 (strongly agree) to 9 (strongly disagree), the extent to which they hold these beliefs. The SOI-R has shown good reliability with Cronbach's α=.83 for the overall global sociosexual orientation score, and strong evidence for the same predictive validity as the original SOI (Penke & Asendorpf, 2008). In the current study, the internal consistency of the SOI-R was Cronbach's α = 0.74. This measure was included to examine the relationship between sexual attitudes and the latent factors in the structural equational model, as well as changes in the key variables for sexual risk taking and substance use over time.

Data Analytic Approach

All models utilized in the structural equational model were tested using latent data analytical techniques with robust weighted least squares estimates (WLSMV) via Mplus software (Version 8.0; Muthén & Muthén, 2017). Robust limited information categorical methods have been found to work well under many conditions, including non-normal data and smaller sample sizes (Rhemtulla, Brosseau-Liard, & Savalei, 2012). These models were considered to

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adequately fit the data as indicated by a non-significant χ^2, Root Mean Square Error of

Approximation (RMSEA; Browne & Cudeck, 1993) less than 0.05, Comparative Fit Index (CFI;

Bentler, 1990) greater than 0.95, and a WRMR of less than 1.0 (Yu & Muthen, 2002). The latent

growth curve models utilized maximum likelihood estimation with robust standard errors

(MLR). The fit of the both the CFA and SEM models were assessed via the following criteria: a

non-significant $\chi2$, Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck,

1993) less than 0.05, Comparative Fit Index (CFI; Bentler, 1990) greater than 0.95, and a

WRMR (weighted root mean residual) of less than 1.0 (Yu & Muthen, 2002) or a SRMR

(standardized root mean square residual) of less than 0.08 (Hu & Bentler, 1999).

Chapter 3

Results

Preliminary Data Analysis

Preliminary analyses were conducted to check the distributional properties of all variables. Descriptive sample statistics for these variables can be found in Table 1 in Appendix N. It was expected that some variables would have a skewed distribution (i.e. one would expect a majority of first sexual experiences to be consensual, thus skewing the distribution). Preliminarily analyses revealed that "lifetime sexual partners" had several outliers. Following the best practices suggested by Aguinis, Gottfredson, and Joo (2013), outliers were identified as values greater than 2.24 standard deviations above the mean (i.e. values above 38.29). Given that these extreme outliers could either be simple error outliers or in themselves interesting data points outside of the normal distribution, it was decided to reduce the extreme values to the nearest endorsed value greater than 2.5 standard deviations above the mean. In accordance with this outlier modification strategy, 10 participant values were reduced to a score of 45 lifetime sexual partners. Bivariate correlations were also conducted to examine the relationships among the indicator variables and exogenous predicator variables (See Table 2 in Appendix O for the correlation matrix). Bivariate correlations revealed a strong correlation between alcohol problems (RAPI) and marijuana problems (RDPI). Given the collinearity and previous research showing that heavy use of both alcohol and marijuana were associated with high levels of sexual risk taking (Gillman, Yeater, Ewing, Kong, & Bryan; 2017), a composite variable of both alcohol and marijuana problems was created for use in the analyses. This composite variable was computed by summing total alcohol problems (RAPI; White & Labouvie, 1989) with total marijuana problems (RDPI; Johnson & White, 1995).

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Data Analysis Strategy for Hypothesis 1

Confirmatory factor analysis (CFA) was conducted to evaluate the adequacy of the measurement model of sexual risk-taking behaviors and attitudes and substance use. The latent variable of sexual risk-taking behaviors and attitudes was proposed to be comprised of condom benefits, condom attitudes, condom intentions, lifetime sexual partners, lifetime use of condoms during sexual intercourse, lifetime sex occurring while under the influence of marijuana, and lifetime sex occurring under the influence of alcohol. The latent variable of substance use was originally theorized to be comprised of AUDIT total scores, alcohol and marijuana problems, marijuana dependency, and illicit substance use history. Given the nature of several indicator variables for sexual risk-taking behaviors and attitudes, as well as the primary endogenous variable of interest (i.e., desirability of first sexual encounter), participant data were removed for those who had not endorsed ever having sexual intercourse. As the literature supports an association between sexual risk taking and substance use (Cooper, 2006; Scivoletto et al. 2002; Andrade, Carroll, & Petry, 2013; Schmiege & Bryan, 2016), it was expected that "Substance Use" and "Sexual Risk-Taking Behaviors and Attitudes" would be associated with each other; thus, these two latent variables were allowed to covary in the model.

Results from the initial measurement model indicated that the model poorly fit the data based on a significant χ^2 test (χ^2 (53) = 361.652, p<0.001), RMSEA = 0.135 (90% CI [0.122, 0.148]), CFI = 0.608, and WRMR = 1.827. Poorly fitting indicators (based on the systematic removal of standardized loadings less than 0.55) were removed to improve model fit. The final measurement model included alcohol/marijuana problems, alcohol dependency, and past 3-month illicit substance use as indicators of substance use; whereas, lifetime number of sexual partners, lifetime sex co-occurring with marijuana, lifetime sex co-occurring with alcohol, and

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lifetime sex occurring with condom use were retained as indicators sexual risk-taking behaviors and attitudes. Results of the respecified measurement model indicated good model fit, with a non-significant χ^2 test (χ^2 (13) = 20.551, p =0.082), RMSEA = 0.043 (90% CI [0.000, 0.076]), CFI = 0.978, and WRMR = 0.545.

In order to evaluate the relationships among these two latent variables and desirability of first sexual experience, sociosexuality, adverse childhood experiences, and impulsivity at baseline, exogenous predictors were added to the measurement model and tested using a structural equation model. The final structural equation model including desirability of first sexual encounter, adverse childhood experiences, and impulsivity as exogenous predictors revealed good model fit, $\chi^2(28) = 37.758$, $p = 0.1031$, RMSEA = .033 (90% CI [.000–.058]), CFI = 0.976, WRMR = 0.678. (See Figure 1 and Table 3 in Appendix P). More adverse childhood experiences were associated with higher levels of substance use ($\beta = 0.206$, $p = .002$), greater desirability of first sexual experience was associated with more sexual risk taking ($\beta = 0.246$, $p = .007$), and higher impulsivity was associated with higher levels of substance use ($\beta = 0.464$, $p < .001$) and more sexual risk taking ($\beta = 0.336$, $p = .001$). Adverse childhood experiences and first sexual encounter were not significantly associated with substance use ($p = .404$ and $p = .311$, respectively).

Data Analysis Strategy for Hypothesis 2

Parallel process latent growth curve modeling was used to evaluate the relationships among desirability of first sexual experience, measured at baseline and parallel trajectories of sexual risk-taking behaviors and substance use. (See Figure 2 in Appendix Q for a graphical representation of the proposed parallel process latent growth model). The composite variable of risky sex was selected as the key variable for sexual risk-taking, and the composite

alcohol/marijuana problems was selected as key variable for substance use. The parallel process latent growth model was analyzed in two steps as suggested in Kline (2011). First, the linear and quadratic growth models for the repeated measures of risky sex and alcohol/marijuana problems were assessed separately. The time scores used for the latent growth trajectories were determined based on the observed times of assessment with the intercept centered at the 3-month assessment (baseline=-1, 3-month=0, 6-month=1, 9-month=2, 12-month=3). Initial model testing indicated that a quadratic model fit the data best for alcohol/marijuana problems; $\chi2 = 9.351$ ($p = .155$), RMSEA = .040 (90% CI [.000–.087]), CFI = 0.984, SRMR = 0.032. Visual inspection and overall poor model fit for the linear and quadratic models for risky sex, suggested discontinuity between baseline and the three-month assessment for the risky sex outcome; thus, the model were re-estimated with baseline risky sex as a covariate predictor of the risky sex growth trajectory. This alternative quadratic model for risky sex was found to fit the data well; $\chi2 = 0.865$ ($p = .649$), RMSEA < .001 (90% CI [.000–.100]), CFI = 1.000, SRMR = 0.013.

Results from the parallel process model indicated good model fit; $\chi2 = 22.399$ ($p = .3768$), RMSEA = .017 (90% CI [.000–.058]), CFI = 0.996, SRMR = 0.033. Results indicated that the average alcohol/marijuana problem score (intercept) was 22.897 ($p < 0.001$) at the 3-month assessment, alcohol/marijuana problem scores decreased on average by 8.542 ($p < 0.001$) at each time point, and the quadratic slope was significant and positive (2.428; $p < 0.001$). Taken together, the linear and quadratic slopes indicate that the average alcohol/marijuana problem score decreased over time, but as time passed the steepness of the descent lessened. The relationship between the linear slope of alcohol/marijuana problems and the quadratic slope was significant (-44.669, $p = 0.041$), meaning that greater linear decrease was associated with slowing

(positive quadratic). No other associations were found between latent trajectory variables for alcohol/marijuana problems.

For risky sex, the average score was 1.162 ($p = 0.014$) at the 3-month assessment (intercept). The linear slope ($p = 0.184$) and quadratic slope ($p = 0.809$) of risky sex were not significant. The relationship between the linear slope of risky sex and the quadratic slope was significant (-12.068, $p = 0.008$), meaning that greater linear increase was associated with slowing (negative quadratic). There was a positive relationship between the average score of risky sex at 3-month assessment (intercept) and the baseline risky sex variable (0.383, $p < 0.001$).

Second, given an acceptable model of change as indicated by the model indices, the predictor variables of desirability of first sexual encounter, sociosexuality, impulsivity, adverse childhood experiences, and intervention condition were added as exogenous predictors to the model to evaluate the relationships with changes in risky sex and alcohol/marijuana problems over time (See Figure 3 in Appendix R for a graphical representation of the parallel process latent growth curve model including exogenous predictors). Results revealed adequate model fit; $\chi2 = 43.097$, $p = .194$, RMSEA = .030 (90% CI [.000–.060]), CFI = 0.981, SRMR = 0.031. Results from the parallel process latent growth curve analysis indicated there was a positive association between impulsivity and initial alcohol/marijuana problems ($\beta = .178$, $p = .015$), with higher levels of impulsivity being associated with higher 3-month alcohol/marijuana problems. The association between impulsivity and the linear slope of alcohol/marijuana problems was significant ($\beta = -.251$, $p = .034$), indicating that higher levels of impulsivity were associated with less positive linear change in alcohol/marijuana problems over time. Taken together, higher impulsivity was related to both greater 3-month alcohol/marijuana problems, and, after taking

this increase in intercept into account, higher impulsivity was associated with a less steep increase of average alcohol/marijuana problems over time.

There was a positive association between sociosexuality and 3-month alcohol/marijuana problems ($\beta = .185$, $p = .020$), with higher scores of sociosexuality being associated with higher 3-month alcohol/marijuana problems. The association between sociosexuality and 3-month risky sex was not significant ($\beta = -.159$, $p = .051$). There was a positive association between adverse childhood experiences and 3-month alcohol/marijuana problems ($\beta = 0.284$, $p = .001$), with more aversive experiences being associated with higher alcohol/marijuana problems. Condition of intervention was positively associated with 3-month (intercept) alcohol/marijuana problems, in that being in the more inclusive intervention (sex + alcohol + marijuana condition in comparison to the sex-only condition) was associated with higher alcohol/marijuana problems at 3-month assessment ($\beta = 0.146$, $p = .034$). Finally, desirability of first sexual encounter was not significantly related to either risky sex nor alcohol/marijuana problems.

Chapter 4

Discussion

Summary of Findings

The present study aimed to examine the effects of desirability of first sexual encounter, impulsivity, sociosexuality, and adverse childhood experiences on sexual risk-taking behaviors and attitudes and substance use in a sample of high-risk male adolescents involved in the criminal justice system. The use of advanced latent variable techniques to examine individual difference risk factors extends research on sexual risk taking and substance use for justice-involved male adolescents through the simultaneous examination of multiple risk factors previously identified in the literature. By including both cross-sectional and longitudinal analyses, it was possible to identify not only factors that may place these adolescents at heightened risk for risky sexual practices and substance use, but to also explore the complex relationships among risk factors and risk-taking behaviors over time.

Using structural equational modeling, four significant associations were found between the predictor variables and the latent constructs. Higher levels of substance use were associated with adverse childhood experiences and higher impulsivity, while sexual risk taking was associated with higher impulsivity and greater desirability of first sexual encounter. Given previous findings of a positive relationship between impulsivity and sexual risk taking (Donohew et al., 2000), and well as the relationship between impulsivity and adolescent substance use (Fernández-Artamendi, Martínez-Loredo, Fernández-Hermida, & Carballo-Crespo, 2016), the observed associations between impulsivity and sexual risk taking and substance use were expected, and consistent with our hypothesis. In addition, consistent with previous literature (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001; Skeer, McCormick, Normand, Buka, & Gilman,

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2009) and one of the hypotheses, more incidents of adverse childhood experiences were found to be associated with greater substance use. However, a relationship between adverse childhood experiences and sexual risk taking was not supported by the analysis, which runs counter our original hypothesis, as well as to the findings of Ramiro, Madrid, & Brown (2010). In this high-risk population, greater desirability of first sexual encounter was positively associated with sexual risk taking, thus, the hypothesis that desirability would be negatively associated with sexual risk taking was not supported. One possible explanation for this finding is that high desirability of first sexual encounter may act as a catalyst for future participation in risky sexual behavior for these high-risk individuals. In exploring possible explanations of their findings that adolescents who endorsed inconsistent condom use reported more positive emotions prior to their last sexual encounter, for instance, Houck et. al (2014) noted that adolescents who highly desired their first sexual encounter may associate positive emotions with having sexual intercourse, and as such, these positive emotions might interfere with safe sexual practice. Moreover, these positive emotions might interfere with condom use by reducing the salience of negative outcomes or by promoting "heat of the moment" decision-making (Houck et al., 2014).

Results from the parallel process latent growth model using a composite risky sex variable as a proxy for sexual risk-taking and alcohol/marijuana problems as a key variable for substance use revealed several interesting associations among the exogenous predictors and level of alcohol/marijuana problems over time. Given the reported relationship between substance use and aversive childhood experience (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001; Skeer, McCormick, Normand, Buka, & Gilman, 2009), the observed association between adverse childhood experiences and the average 3-month alcohol/marijuana problems in the current study was expected and supported our hypothesis. Likewise, the association between sociosexuality

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and 3-month alcohol/marijuana problems was anticipated given the state of the literature on sociosexuality, which found an association between sociosexual attitudes and alcohol use among men (Corbin et al.; 2016). Though the lack of associations between sociosexuality or adverse childhood experiences with changes in alcohol/marijuana problems was unanticipated; nonetheless, these null findings suggest that while these characteristics might place justice-involved adolescents at increased initial risk of substance problems, neither accounts for changes in average substance use problems over time. Other variables not examined in the present study might account for changes in substance use problems over time, such as peer group use, using substances to cope (Littlefield, Sher, & Wood; 2009), and early onset of alcohol use which has been found to be associated with risk for heavy alcohol use (Kim et al., 2017).

The association between impulsivity and the average 3-month value of alcohol/marijuana problems suggests that this behavioral tendency may place this vulnerable population at heightened risk for 3-month substance problems. However, the association between impulsivity and the linear slope of alcohol/marijuana problems might indicate that extreme levels of impulsivity also may account for a significantly slower increase in substance problems over time, after accounting for the effect of the heightened impulsivity on the average 3-month assessment value. Another possibility is these high impulsivity adolescents are more likely to undergo "maturing out" of heavy substance use. Notably, Littlefield, Sher, & Wood (2009) found that changes in alcohol problems corresponded to changes in impulsivity. Furthermore, Littlefield et al. (2009) found that participants who had a decrease in impulsivity over time were more likely to reduce their drinking to cope. These findings might indicate that changes in personality may be directly related to maturing out of heavy alcohol use.

Desirability of first sexual encounter was not associated significantly with either the risky sex composite or alcohol/marijuana problems, which, given the observed relationship between desirability and the sexual risk taking found in the cross-sectional analysis, was surprising and was counter to our hypothesis. Considering the literature which supports the relationship between substance use and sexual assault for both men and women, the current findings might be influenced by measurement error with the desirability measure such as the wording of the item (e.g. how much did you want the first sexual intercourse to happen), participant error in interpreting the item's scale, or anchoring effects of the Likert scale. Another possibility is that inquiring about desirability of first sexual encounter does not correspond well to extant definitions of sexual assault. The nonsignificant relationships found in the parallel process latent growth curve model between desirability and the longitudinal key variables (risky sex composite and alcohol/marijuana problems) may indicate that the single item nature of the desirability measure in this study influenced the results. The use of a multiple item measure of desirability of first sexual encounter in future research would allow for researchers to test the reliability and validity of this construct beyond the current study. Moreover, the non-normal distribution of the desirability measure may also have influenced the results, as most participants endorsed "really wanting" their first sexual encounter (n = 190), while very few participants endorsed "really not wanting" their first sexual encounter (n = 12). The lack of endorsement of the lower end of desirability (i.e. less desirability of first sexual encounter) may have artificially skewed the potential influence of desirability on both sexual risk taking and substance use. One possible solution is for future research to use either the Sexual Experiences Survey (SES; Koss 1987) to examine sexual violence since the age of 14, or a modified version of the SES which is designed

to assess adolescent's experiences of sexually coercive behavior (Abbey & McAuslan, 2004; Abbey et al., 2005).

The overall slope sexual risk taking was not significant, which suggests that on average risky sex did not increase or decrease over time. Furthermore, the initial status (average risky sex composite scores at 3-month assessment), and the quadratic slope of risky sex were not significant. However, the relationship between the quadratic and linear slope of risky sex was significant, suggesting that participants with a steeper decrease in sexual risk taking experienced a lessening of this slope over time. This could indicate that adolescents who drastically reduce their sexual risk taking quickly do not continue to evidence a reduction in risk taking over time. Results indicated that after accounting for baseline levels of sexual risk taking, the selected predictor variables may not account for changes in risky sex over time, which does not support our original hypothesis that desirability of first sexual encounter, impulsivity, sociosexuality, and adverse childhood experiences would be associated with changes in sexual risk taking. Considering the cross-sectional association among sexual risk taking and impulsivity and desirability of first sexual encounter, the lack of longitudinal associations with risky sex was unexpected. Furthermore, the lack of associations between the initial status of risky sex and alcohol/marijuana problems and between the average changes in risky sex and alcohol/marijuana problems over time was surprising considering associations found in similar work (Thayer, Montanaro, Weiland, Callahan, & Bryan, 2014). For example, when examining a similar justice-involved adolescent sample, Thayer at al (2014) found that on average participants who reported higher levels of risky sex at baseline also reported higher alcohol use at baseline, as well as a positive association between changes in alcohol frequency and risky sex, over time. One possible explanation is that, at baseline, these male justice-involved adolescents where already

engaging in such high risk sexual behavior that the predictor variables used in the longitudinal analysis were simply shadowed by this heightened baseline's effect.

These null findings may indicate that additional predictor variables not used in these analyses may play a critical role in longitudinal changes for sexual risk-taking and substance use in this high-risk population. As such, future research might benefit from examining additional risk factors, such as romantic relationship factors (i.e. length of relationship) in regard to sexual risk taking (Manning, Flanigan, Giordano, & Longmore, 2009), emotions prior to engaging in risk taking behaviors (Houck et. al.; 2014), and variability in neurophysiology (e.g. variability in neurophysiology has been shown to influence initial alcohol use and change in alcohol use over time; Thayer, Montanaro, Weiland, Callahan, & Bryan, 2014). Future research could also examine potential protective factors such as parental monitoring, as such monitoring has been shown to protect against early sexual debut and risky sexual behaviors (Lohman & Billings, 2008). Alternatively, future research could examine the complex relationships among risk factors specific to adolescents including potential clusters of risk factors. For example, examining differences in risk taking behaviors between adolescents with moderate impulsivity and many adverse childhood experiences, in comparison to adolescents with higher impulsivity but moderate adverse childhood experiences. By analyzing clusters of risk factors using latent class analysis, it would be possible to identify specific combinations that would place adolescents at even greater risk, and thus one could use this information to inform the development of future interventions for justice-involved adolescents.

Limitations

Previous research has identified a possible limitation to studies examining adolescents involved with the juvenile justice system: these adolescents might have been required to undergo

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drug testing which would have occurred during the follow-up assessments (Robbins & Bryan, 2004). If this was the case in this study, then one would expect self-reported rates of recent alcohol and drug use to potentially be lower than reported rates if these adolescents were not continually monitored by the justice system. This has the potential to affect the magnitude of the relationships observed in the latent growth curve model.

When examining latent variable modeling, there are an infinite number of equivalent and/or alternative models that were not tested in the current analyses, which might fit the data as well or better than the model proposed here. As such, any conclusions drawn from these post-hoc analyses should be replicated in a new sample to increase confidence in the validity of the factor structure and latent trajectories. Finally, these results may not be applicable to other adolescents who engage in high risk sexual and substance-related behaviors but who are not part of the juvenile justice system. Relatedly, these results might not generalize to adolescents outside of the southwest region of the United States.

Justice-involved male adolescents are a vulnerable population in great need of effective interventions to reduce high-risk behaviors and recidivism. Results from current study, at both the cross-sectional and longitudinal level of analysis, highlight the need for interventions for these at-risk young men to help them cope effectively with adverse childhood experiences, consider the impact of their attitudes towards causal sex, and account for their impulsive sensation seeking tendencies. While this study has advanced the current knowledge on this historically understudied population, additional work in this area is still needed to fully understand risk factors that are specific to adolescents.

APPENDICES

Appendix A
Demographic Questionnaire

Are you a boy or girl?
Boy   Girl

How old are you?
14   15   16   17   18

Are you still in school?
Yes   No

What is your ethnic background?
White   African-American   Hispanic-American   American Indian/Native
American Asian or Pacific Islander   Other

How many times have you been arrested in your life?
1   2   3   4   5   6   7   8   9   10   11   12 or more

Appendix B
Sexual History

INSTRUCTIONS: The next set of questions ask about your sexual behavior. Some of these questions ask about sensitive information. Remember, if there is any question that you feel is too personal, you do not have to answer that question.

On a scale from 1 to 5, where 1 means "I really did not want it to happen" and 5 means "I really wanted it to happen", how much did you want that first sexual intercourse to happen?

1 I really did not want it to happen	2	3	4	5 I really wanted it to happen

In your lifetime, how many people have you had sexual intercourse with?

_____

How much of the time have you used condoms when you've had sexual intercourse?

| Never | Almost Never | Sometimes | Almost Always | Always | I do not feel comfortable answering this question |

Of all of the times you've had sexual intercourse, how much of the time have you smoked marijuana before sex?

| Never | Almost Never | Sometimes | Almost Always | Always | I do not feel comfortable answering this question |

Of all of the times you've had sexual intercourse, how much of the time have you drank alcohol before sex?

| Never | Almost Never | Sometimes | Almost Always | Always | I do not feel comfortable answering this question |

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Appendix C
Condom Benefits

INSTRUCTIONS: The next set of questions ask how you feel in general about condoms, and whether or not you think condoms are something that you personally should use. Please answer all of these questions even if you have never had sex or have never used a condom.

Please tell us how much you agree with each of the following statements by circling <u>disagree a lot, kind of disagree, kind of agree, or agree a lot.</u>

READ EACH QUESTIONS CAREFULLY, AND CIRCLE ONLY ONE ANSWER TO EACH QUESTION.

1. Using condoms will help me stay healthy.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

2. Condom use would be a good thing for me to do if I was sexually active.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

3. I think it is very important for me to prevent pregnancy.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

4. I think it is very important for me to prevent getting a sexually transmitted disease like herpes or AIDS.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

5. I think condoms are effective at keeping people from getting sexually transmitted diseases like chlamydia and gonorrhea.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

6. I think condoms are effective at keeping people from getting AIDS.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

7. What do you think is the most important reason to use condoms?

| Birth Control | AIDS/STD Prevention | I do not feel comfortable answering this question |

Appendix D
Condom Attitudes

INSTRUCTIONS: The next questions ask about your attitudes towards condoms. Please answer all of these questions even if you have never had sex or have never used a condom.

Please tell us how much you agree with each of the following statements by circling <u>disagree a lot, kind of disagree, kind of agree, or agree a lot.</u>

READ EACH QUESTIONS CAREFULLY, AND CIRCLE ONLY ONE ANSWER TO EACH QUESTION.

1. A condom is not necessary when you are with the same partner for a long time.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

2. A condom is not necessary when you and your partner agree not to have sex with anyone else.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

3. Condoms are not necessary if you know your partner.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

4. A condom is not necessary if you're pretty sure your partner doesn't have an STD.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

5. Condoms take away the pleasure of sex.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

6. Sex with condoms feel just as good as sex without condoms.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

7. Condoms take all the fun out of sex.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

8. Sex is not as good when you use a condom.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

9. Condoms can ruin the sexual mood.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

10. People who use condoms are very responsible.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

11. I wouldn't mind if my partner brought up the idea of using a condom.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

12. If my partner suggested condoms I would respect him or her.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

13. If my partner suggested condoms I would feel relieved.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

14. Condoms take too much time to put on.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

15. Condoms are difficult to put on and keep on.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

16. When I put a condom on it makes me or my partner lose an erection.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

17. People who use condoms sleep around a lot.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

18. People who carry condoms would have sex with anyone.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

19. People who carry around condoms are just looking for sex.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

20. Condoms can be good because they make sex last longer.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

21. If I did not use a condom, I would feel bad.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

22. I would regret not using a condom.

| Disagree a lot | Kind of disagree | Kind of agree | Agree a lot | I do not feel comfortable answering this question |

23. I would be concerned if I did not use a condom.

Disagree a lot	Kind of disagree	Kind of agree	Agree a lot	I do not feel comfortable answering this question

On a scale from 1 to 7, where 1 means unhealthy and 7 means healthy, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Unhealthy						Healthy

On a scale from 1 to 7, where 1 means harmful and 7 means beneficial, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Harmful						Beneficial

On a scale from 1 to 7, where 1 means unpleasant and 7 means pleasant, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Unpleasant						Pleasant

On a scale from 1 to 7, where 1 means bad and 7 means good, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Bad						Good

On a scale from 1 to 7, where 1 means worthless and 7 means valuable, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Worthless						Valuable

On a scale from 1 to 7, where 1 means unenjoyable and 7 means enjoyable, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Unenjoyable						Enjoyable

On a scale from 1 to 7, where 1 means punishing and 7 means rewarding, for me, using a condom every time I have sex would be:

1	2	3	4	5	6	7
Punishing						Rewarding

Appendix E
Condom Intentions

INSTRUCTIONS: The next questions ask what you plan to do about condoms in the future. Please answer all of these questions even if you have never had sex or have never used a condom.

Please tell us how likely each of these things are to happen by circling <u>will not happen, probably won't happen, probably will happen, or will definitely happen.</u>

READ EACH QUESTIONS CAREFULLY, AND CIRCLE ONLY ONE ANSWER TO EACH QUESTION.

1. How likely is it that you will buy or get condoms in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

2. How likely is it that you will carry condoms with you in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

3. How likely is it that you will talk to a sex partner about using condoms in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

4. How likely is it that you will use a condom every time you have sexual intercourse in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

The next questions ask what you plan to do about condom use in the future when smoking marijuana and drinking alcohol. Please do your best to answer all of these questions, even if you've never had sex before, never used condoms, or never used marijuana or alcohol. If you've never smoked marijuana or drank alcohol or never had sex after smoking marijuana or drinking alcohol do your best to imagine what you would do based on your knowledge of marijuana and alcohol and the experiences your friends may have had.

5. How likely is it that your will have sex after smoking marijuana at least once in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

6. How likely is it that you will use a condom when you have been smoking marijuana in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

7. How likely is it that you will remember to carry condoms with you if you are going to be smoking marijuana in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

8. How likely is it that you will use a condom every time you have sexual intercourse and have been smoking marijuana in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

9. How likely is it that you will smoke marijuana less/monitor your marijuana use the next time you are in a situation where you might have sex in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

10. How likely is it that you will have a friend 'look after' you the next time you are smoking marijuana and plan to have sex, in case you forget to carry condoms in the next three months?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

11. How likely is it that you will make a plan for yourself (e.g. plan on not smoking a lot, plan on having your friends keep you company, plan on not having sexual intercourse) before you smoke marijuana in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

12. How likely is it that you will have sex after drinking alcohol at least once in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

13. How likely is it that you will use a condom when you have been drinking alcohol in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

14. How likely is it that you will remember to carry condoms with you if you are going to be drinking alcohol in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

15. How likely is it that you will use a condom every time you have sexual intercourse and have been drinking alcohol in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

16. How likely is it that you will drink alcohol less/monitor your alcohol use the next time you are in a situation where you might have sex in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

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17. How likely is it that you will have a friend 'look after' you the next time you are drinking alcohol and plan to have sex, in case you forget to carry condoms in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

18. How likely is it that you will make a plan for yourself (e.g. plan on not drinking a lot, plan on having your friends keep you company, plan on not having sexual intercourse) before you drink alcohol in the next three months?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

Imagine you are going to be hanging out tonight, and a girl or guy that you like, but with whom you haven't had sex with yet, will be there. If you knew you were going to be hanging out with this person:

19. How likely would you be to buy condoms before meeting up with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

20. How likely would you be to discuss condoms with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

21. How likely would you be to carry condoms with you?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

22. How likely would you be to use condoms if you had sex with the girl/guy?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

Imagine you are going to be hanging out and drinking a lot of alcohol tonight. A girl or guy that you like, but with whom you haven't had sex with yet, will be getting drunk too. If you knew you were going to be hanging out with this person:

23. How likely would you be to buy condoms before meeting up with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

24. How likely would you be to discuss condoms with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

25. How likely would you be to carry condoms with you?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

26. How likely would you be to use condoms if you had sex with the girl/guy?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

Imagine you are going to be hanging out with people tonight and smoking weed. A girl or guy that you like, but with whom you haven't had sex with yet, will be getting stoned too. If you knew you were going to be hanging out with this person:

27. How likely would you be to buy condoms before meeting up with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

28. How likely would you be to discuss condoms with them?

| Will NOT happen | Probably won't happen | Probably will happen | Will DEFINITELY happen | I do not feel comfortable answering this question |

29. How likely would you be to carry condoms with you?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

30. How likely would you be to use condoms if you had sex with the girl/guy?

Will NOT happen	Probably won't happen	Probably will happen	Will DEFINITELY happen	I do not feel comfortable answering this question

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Appendix F
Substance Use History Questionnaire (SUH)

INSTRUCTIONS: The next set of questions asks about your behavior with regard to drug use. Please answer each question honestly. Remember, everything you say is completely private.

1. In the last 3 months, how frequently have you used crack/cocaine?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

2. How old were you when you first used crack/cocaine?

I have never used crack/cocaine

Younger than 8   8   9   10   11   12   13   14   15-16   Older than 16

3. In the last 3 months, how frequently have you used LSD/Acid?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

4. How old were you when you first used LSD/Acid?

I have never used LSD/Acid

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

5. In the last 3 months, how frequently have you used mushrooms?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

6. How old were you when you first used mushrooms?

I have never used mushrooms

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

7. In the last 3 months, how frequently have you used ecstasy?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

8. How old were you when you first used ecstasy?

I have never used ecstasy

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

9. In the last 3 months, how frequently have you used GHB?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

10. How old were you when you first used GHB?

I have never used GHB

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

11. In the last 3 months, how frequently have you used heroin?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

12. How old were you when you first used heroin?

I have never used heroin

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

13. In the last 3 months, how frequently have you used ketamine?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

14. How old were you when you first used ketamine?

I have never used ketamine

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

15. In the last 3 months, how frequently have you used crystal meth?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

16. How old were you when you first used crystal meth?

I have never used crystal meth

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

17. In the last 3 months, how frequently have you used prescription drugs NOT prescribed to you (examples: Oxycontin, Vicodin, Valium, Adderall etc)?

Never	Occasionally	Once a month	2-3 times a month	4-5 times a month	Once a week	2-3 times a week	4-5 times a week	Every day

18. How old were when you first used a prescription drug NOT prescribed to you (examples: Oxycontin, Vicodin, Valium, Adderall etc)?

I have never used a prescription drug not prescribed to me

Younger than 8   8   9   10   11   12   13   14   15   16   Older than 16

19. Please list any other drugs you have used in the past three months on the line below:

_____

Appendix G
Rutgers Alcohol Problem Index (RAPI)

INSTRUCTIONS: How many times did the following happen to you <u>while you were drinking alcohol</u> or <u>because of your alcohol use</u> during the last 3 months?

READ EACH STATEMENT CAREFULLY, AND CIRCLE ONLY *ONE* ANSWER TO EACH STATEMENT.

1. Not able to do your homework or study for a test

Never   1-2 times   3-5 times   6-10 times   More than 10 times

2. Got into fights, acted bad, or did mean things

Never   1-2 times   3-5 times   6-10 times   More than 10 times

3. Missed out on other things because you spent too much money on alcohol

Never   1-2 times   3-5 times   6-10 times   More than 10 times

4. Went to work or school high or drunk

Never   1-2 times   3-5 times   6-10 times   More than 10 times

5. Caused shame or embarrassment to someone

Never   1-2 times   3-5 times   6-10 times   More than 10 times

6. Neglected your responsibilities

Never   1-2 times   3-5 times   6-10 times   More than 10 times

7. Relatives avoided you

Never   1-2 times   3-5 times   6-10 times   More than 10 times

8. Felt that you needed more alcohol than you used to use in order to get the same effect

Never   1-2 times   3-5 times   6-10 times   More than 10 times

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9. Tried to control your drinking by trying to drink only certain times of day or certain places

Never   1-2 times   3-5 times   6-10 times   More than 10 times

10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on drinking

Never   1-2 times   3-5 times   6-10 times   More than 10 times

11. Noticed a change in your personality

Never   1-2 times   3-5 times   6-10 times   More than 10 times

12. Felt that you had a problem with school

Never   1-2 times   3-5 times   6-10 times   More than 10 times

13. Missed a day (or part of a day) of school or work

Never   1-2 times   3-5 times   6-10 times   More than 10 times

14. Tried to cut down on drinking

Never   1-2 times   3-5 times   6-10 times   More than 10 times

15. Suddenly found yourself in a place that you could not remember getting to

Never   1-2 times   3-5 times   6-10 times   More than 10 times

16. Passed out or fainted suddenly

Never   1-2 times   3-5 times   6-10 times   More than 10 times

17. Had a fight, argument, or bad feelings with a friend

Never   1-2 times   3-5 times   6-10 times   More than 10 times

18. Had a fight, argument or bad feelings with a family member

Never   1-2 times   3-5 times   6-10 times   More than 10 times

19. Kept drinking when you promised yourself not to

Never   1-2 times   3-5 times   6-10 times   More than 10 times

20. Felt you were going crazy

Never   1-2 times   3-5 times   6-10 times   More than 10 times

21. Had a bad time

Never   1-2 times   3-5 times   6-10 times   More than 10 times

22. Felt physically or physiologically dependent on alcohol

Never   1-2 times   3-5 times   6-10 times   More than 10 times

23. Was told by a friend or neighbor to stop or cut down your drinking

Never   1-2 times   3-5 times   6-10 times   More than 10 times

Appendix H
Alcohol Use Disorders Identification Test (AUDIT)

INSTRUCTIONS: Please answer the following questions honestly.

1. How often do you have a drink containing alcohol?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

2. How many drinks containing alcohol do you have on a typical day when you are drinking?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

3. How often do you have 6 or more drinks on one occasion?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

4. How often during the last 3 months have you found that you were not able to stop drinking once you had started?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

5. How often during the last 3 months have you failed to do what was normally expected of you because of drinking?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

6. How often during the last 3 months have you need a first drink in the morning to get yourself going after a heavy drinking session?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

7. How often during the last 3 months have you had a feeling of guilt or remorse after drinking?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

8. How often during the last 3 months have you been unable to remember what happened the night before because you had been drinking?				
Never	Less than monthly	Monthly	Weekly	Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?		
No	Yes, but not in the last 3 months	Yes, during the last 3 months

10. Has a relative or friend, doctor or health worker been concerned about your drinking or suggest you cut down?		
No	Yes, but not in the last 3 months	Yes, during the last 3 months

11. Are you currently in treatment for alcohol use?		
Yes	No	I do not feel comfortable answering this question

Appendix I
Marijuana Problems (RDPI)

INSTRUCTIONS: How many times did the following happen to you <u>while you were smoking</u> <u>marijuana</u> or <u>because of your marijuana use </u>during the last 3 months?

READ EACH STATEMENT CAREFULLY, AND CIRCLE ONLY *ONE* ANSWER TO EACH STATEMENT.

1. Not able to do your homework or study for a test

Never   1-2 times   3-5 times   6-10 times   More than 10 times

2. Got into fights, acted bad, or did mean things

Never   1-2 times   3-5 times   6-10 times   More than 10 times

3. Missed out on other things because you spent too much money on marijuana

Never   1-2 times   3-5 times   6-10 times   More than 10 times

4. Went to work or school high or stoned

Never   1-2 times   3-5 times   6-10 times   More than 10 times

5. Caused shame or embarrassment to someone

Never   1-2 times   3-5 times   6-10 times   More than 10 times

6. Neglected your responsibilities

Never   1-2 times   3-5 times   6-10 times   More than 10 times

7. Relatives avoided you

Never   1-2 times   3-5 times   6-10 times   More than 10 times

8. Felt that you needed more marijuana than you used to use in order to get the same effect

Never   1-2 times   3-5 times   6-10 times   More than 10 times

9. Tried to control your marijuana use by trying to smoke marijuana only certain times of day or certain places

Never   1-2 times   3-5 times   6-10 times   More than 10 times

10. Had withdrawal symptoms, that is, felt sick because you stopped or cut down on smoking marijuana

Never   1-2 times   3-5 times   6-10 times   More than 10 times

11. Noticed a change in your personality

Never   1-2 times   3-5 times   6-10 times   More than 10 times

12. Felt that you had a problem with school

Never   1-2 times   3-5 times   6-10 times   More than 10 times

13. Missed a day (or part of a day) of school or work

Never   1-2 times   3-5 times   6-10 times   More than 10 times

14. Tried to cut down on smoking marijuana

Never   1-2 times   3-5 times   6-10 times   More than 10 times

15. Suddenly found yourself in a place that you could not remember getting to

Never   1-2 times   3-5 times   6-10 times   More than 10 times

16. Passed out or fainted suddenly

Never   1-2 times   3-5 times   6-10 times   More than 10 times

17. Had a fight, argument, or bad feelings with a friend

Never   1-2 times   3-5 times   6-10 times   More than 10 times

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18. Had a fight, argument or bad feelings with a family member

Never   1-2 times   3-5 times   6-10 times   More than 10 times

19. Kept smoking marijuana when you promised yourself not to

Never   1-2 times   3-5 times   6-10 times   More than 10 times

20. Felt you were going crazy

Never   1-2 times   3-5 times   6-10 times   More than 10 times

21. Had a bad time

Never   1-2 times   3-5 times   6-10 times   More than 10 times

22. Felt physically or physiologically dependent on marijuana

Never   1-2 times   3-5 times   6-10 times   More than 10 times

23. Was told by a friend or neighbor to stop or cut down your marijuana use

Never   1-2 times   3-5 times   6-10 times   More than 10 times

24. Felt paranoid or overly nervous in everyday life.

Never   1-2 times   3-5 times   6-10 times   More than 10 times

25. Felt unmotived to do things you needed to do in your everyday life.

Never   1-2 times   3-5 times   6-10 times   More than 10 times

26. Lost interest in things you once enjoyed.

Never   1-2 times   3-5 times   6-10 times   More than 10 times

27. Noticed that your memory was not as good as it used to be

Never   1-2 times   3-5 times   6-10 times   More than 10 times

28. Lost some physical coordination in everyday activities

Never   1-2 times   3-5 times   6-10 times   More than 10 times

29. Had trouble thinking clearly in everyday activities

Never   1-2 times   3-5 times   6-10 times   More than 10 times

30. Are there any other problems that you have experienced in your life because of your marijuana use?

_____

Appendix J
Marijuana Dependence Scale (MDS)

INSTRUCTION: The following is a series of questions that will ask what, if any, symptoms you may have experienced with regards to marijuana use over the past three months.

If you HAVE experienced a particular symptom, please place a check mark on the line in the "Yes" column. If you have NOT experienced a particular symptom, please place a check mark on the line in the "No" column.

The need to smoke more marijuana to achieve the same "high"	Yes	No
A feeling of being less "high" after consistently smoking the same amount of marijuana	Yes	No
Feeling what might be described as a "withdrawal symptom" (e.g. sleep disturbance, irritability, etc…)	Yes	No
Smoking more marijuana over a period of time than you had originally intended to	Yes	No
A desire to cut back or reduce your marijuana smoking habits	Yes	No
A failure to cut back or reduce your marijuana smoking habits after attempting to do so	Yes	No
Spending a significant amount of time trying to obtain, use, or recover from marijuana	Yes	No
Giving up reducing important social or work-related activities in order to smoke marijuana	Yes	No
Continuing to smoke marijuana after experiencing a consistent physical or psychological problem that may have been caused by smoking marijuana (e.g., using marijuana despite continuous anxiety attacks that might have been induced by smoking marijuana	Yes	No
Feeling the need to smoke marijuana to avoid experiencing "withdrawal symptoms"	Yes	No

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Appendix K
Impulsive Sensation Seeking Scale (IMPSS)

INSTRUCTIONS: Read each of the following statements. If you agree with a statement or decide that it is true for you, answer TRUE. If you disagree with a statement or feel that it is not true for you, answer FALSE. ANSWER EVERY STATEMENT BY CIRCLING EITHER TRUE OR FALSE EVEN IF YOU AREN'T ENTIRELY SURE OF YOUR ANSWER.

I tend to begin a new job without much advance planning on how I will do it.	True	False
I usually think about what I am going to do before I do it.	True	False
I often do things on impulse.	True	False
I don't spend much time on the details of planning ahead.	True	False
I like to have new and exciting experiences and sensations, even if they are a little frightening.	True	False
Before I begin a complicated job, I make careful plans.	True	False
I would like to take a spontaneous trip with no pre-planned or definite routes or timetable.	True	False
I enjoy getting into new situations where you can't predict how things will turn out.	True	False
I like doing things just for the thrill of it.	True	False
I tend to change interests frequently.	True	False
I sometimes like to do things that are a little frightening.	True	False
I'll try anything once.	True	False
I would like the kind of life where I am on the move and traveling a lot, with lots of change and excitement.	True	False
I sometimes do "crazy" things just for fun.	True	False
I like to explore a strange city or section of town by myself, even if it means getting lost.	True	False
I prefer friends who are exciting and unpredictable.	True	False
I often get so carried away by new and exciting things and ideas that I don't think of what might go wrong.	True	False
I am an impulsive person.	True	False
I like wild and uninhibited parties.	True	False

Appendix L
The Early Life Stress Questionnaire (ELSQ)

INSTRUCTIONS: The following is a list of many things that have happened to people your age. Please let us know which of these things you have experienced during your life.

Please answer YES, NO, or DON'T KNOW.

Born prematurely, or were there any problems with your birth?	Yes	No	Don't Know
Been adopted or in foster care.	Yes	No	Don't Know
Had a surgery or hospitalization.	Yes	No	Don't Know
Experienced a serious illness or injury.	Yes	No	Don't Know
Been bullied or rejected at school.	Yes	No	Don't Know
Been physically abused (e.g., hit, punched or kicked).	Yes	No	Don't Know
Been sexually abused (e.g., had someone forced you to touch you or them in a sexual way).	Yes	No	Don't Know
Been emotionally abused (e.g., been ignored or tormented).	Yes	No	Don't Know
Been poor or neglected (e.g., couldn't buy food or other things when you needed it).	Yes	No	Don't Know
Witnessed a natural disaster such as earthquake, flood or fire?	Yes	No	Don't Know
Had your home destroyed.	Yes	No	Don't Know
Seen, in real life, violence or warfare.	Yes	No	Don't Know
Had your parents divorce or separate.	Yes	No	Don't Know
Been separated for a long period from a parent, brother or sister.	Yes	No	Don't Know
Had family members consistently fight or conflict.	Yes	No	Don't Know
Had one of your parents, a brother or sister die.	Yes	No	Don't Know
Had one of your parents, a brother or sister experience a life-threatening illness.	Yes	No	Don't Know
Saw domestic violence happen within your family (e.g., saw one of your parents beat up the other).	Yes	No	Don't Know
Saw a traumatic event (e.g., something happen that stayed with you, made you nervous, gave you nightmares).	Yes	No	Don't Know
Has your guardianship changed? (meaning, have you gone from living with your mom or dad to another person like an aunt, uncle or other caregiver?)	Yes	No	Don't Know

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Appendix M
Sociosexuality Orientation Inventory (SOI-R)

INSTRUCTIONS: The next set of questions, ask about your sexual behavior. Please answer each question honestly. Remember, everything you say is completely private.

1. With how many different partners have you had sex within the 12 months?

0	1	2	3	4	5-6	7-9	10-19	20 or more

2. With how many different partners have you had sexual intercourse on *one and only one* occasion?

0	1	2	3	4	5-6	7-9	10-19	20 or more

3. With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?

0	1	2	3	4	5-6	7-9	10-19	20 or more

4. Sex without life is OK.

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

5. I can imagine myself being comfortable and enjoying "casual" sex with different partners.

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

6. I do *not* want to have sex with a person until I am sure that we will have a long-term, serious relationship.

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

7. How often do you have fantasies about having sex with someone with whom you do *not* have a committed romantic relationship?

1 – never	2 – very seldom	3 – about once every two or three months	4 – about once a month	5 – about once every two weeks	6 – about once a week	7 – several times per week	8 – nearly everyday	9 – at least once a day

8. How often do you experience sexual arousal when you are in contact with someone with whom you do *not* have a committed romantic relationship?

1 –	2 –	3 –	4 –	5 –	6 –	7 –	8 –	9 –
never	very seldom	about once every two or three months	about once a month	about once every two weeks	about once a week	several times per week	nearly everyday	at least once a day

9. In everyday life, how often do you have spontaneous fantasies about having sex with someon you have just met?

1 –	2 –	3 –	4 –	5 –	6 –	7 –	8 –	9 –
never	very seldom	about once every two or three months	about once a month	about once every two weeks	about once a week	several times per week	nearly everyday	at least once a day

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Appendix N
Full Sample Statistics

Table 1

Exogenous Predictors, Sexual Risk-Taking Behaviors and Attitudes, and Substance Use Variables:
Descriptive Statistics

Variable	N	Mean (s.d.)	Range	Min	Max	Skewness	Kurtosis
Desirability of First Sexual Encounter	314	4.354 (0.998)	4	1	5	-1.78	2.93
Sociosexuality	347	32.651 (13.097)	65	6	71	.109	-.557
Aversive Childhood Experiences	346	6.908 (4.138)	18	0	18	.220	-.659
Impulsivity Sensation Seeking	347	11.130 (4.112)	18	1	19	-.345	-.575
Condom Benefits	346	3.346 (0.371)	2.21	1.50	3.71	-1.503	3.510
Condom Attitudes	346	2.773 (0.506)	2.61	1.35	3.96	-.021	-.262
Condom Intentions	346	2.571 (0.608)	2.83	1.00	3.83	-.169	-.438
Lifetime Sexual Partners	346	9.85 (12.695)	100	0	100	3.537	17.545
Lifetime Sex: Condom	317	3.063 (1.170)	4	1	5	-.207	-.666
Lifetime Sex: Alcohol	317	2.647 (1.016)	4	1	5	-.176	-.349
Lifetime Sex: Marijuana	317	3.041 (1.200)	4	1	5	-.257	-.607
AUDIT	347	9.787 (7.897)	40	0	40	.942	.896
Illicit Substance Use	347	2.089 (2.138)	9	0	9	.937	.182
Marijuana Dependency	347	3.006 (2.823)	10	0	10	.809	-.211
Alcohol/Marijuana Problems	347	18.767 (19.020)	93	0	93	1.519	2.076

Appendix O
Correlation Matrix

Table 2

Zero-Order Correlations Among Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Desirability of First Sexual Encounter	1															
Sociosexuality	.199**	1														
Aversive Childhood Experiences	.069	.176**	1													
Impulsivity Sensation Seeking	.143*	.301**	.299**	1												
Condom Benefits	.060	-.070	-.024	-.056	1											
Condom Attitudes	-.015	-.074	.024	-.251**	.357**	1										
Condom Intentions	-.052	-.106*	.113*	-.100	.263**	.502**	1									
Lifetime Partners	.075	.297**	-.095	.068	-.162**	-.091	.034	1								
Lifetime Condom	-.001	-.051	-.049	-.153**	.287**	.514**	.409**	.015	1							
Lifetime Alcohol	.164**	.277**	.027	.240**	-.110	-.091	-.077	.178**	-.102	1						
Lifetime Marijuana	.204**	.253**	.067	.166**	-.175**	-.065	-.044	.220**	-.091	.360**	1					
AUDIT	.144*	.349**	.202**	.370**	-.097	-.191**	-.089	.114*	-.138*	.461**	.280**	1				
Illicit Substance Use	.027*	.339**	.187**	.316**	-.076	-.101	-.068	.198**	-.028	.329**	.279**	.361**	1			
Marijuana Dependency	.003*	.229**	.112*	.259**	.015	-.097	.014	.119*	-.051	.209**	.300**	.300**	.302**	1		
Rutgers Alcohol Problem Index	.117*	.303**	.254**	.380**	-.103	-.057	-.098	.169**	-.094	.360**	.277**	.612**	.330**	.430**	1	
Marijuana Problems	.136*	.261**	.235**	.322**	-.060	-.096	-.112*	.042	-.105	.261**	.358**	.414**	.285**	.635**	.703**	1

** $p < .01$, * $p < .05$

Appendix P
Structural Equation Model Results
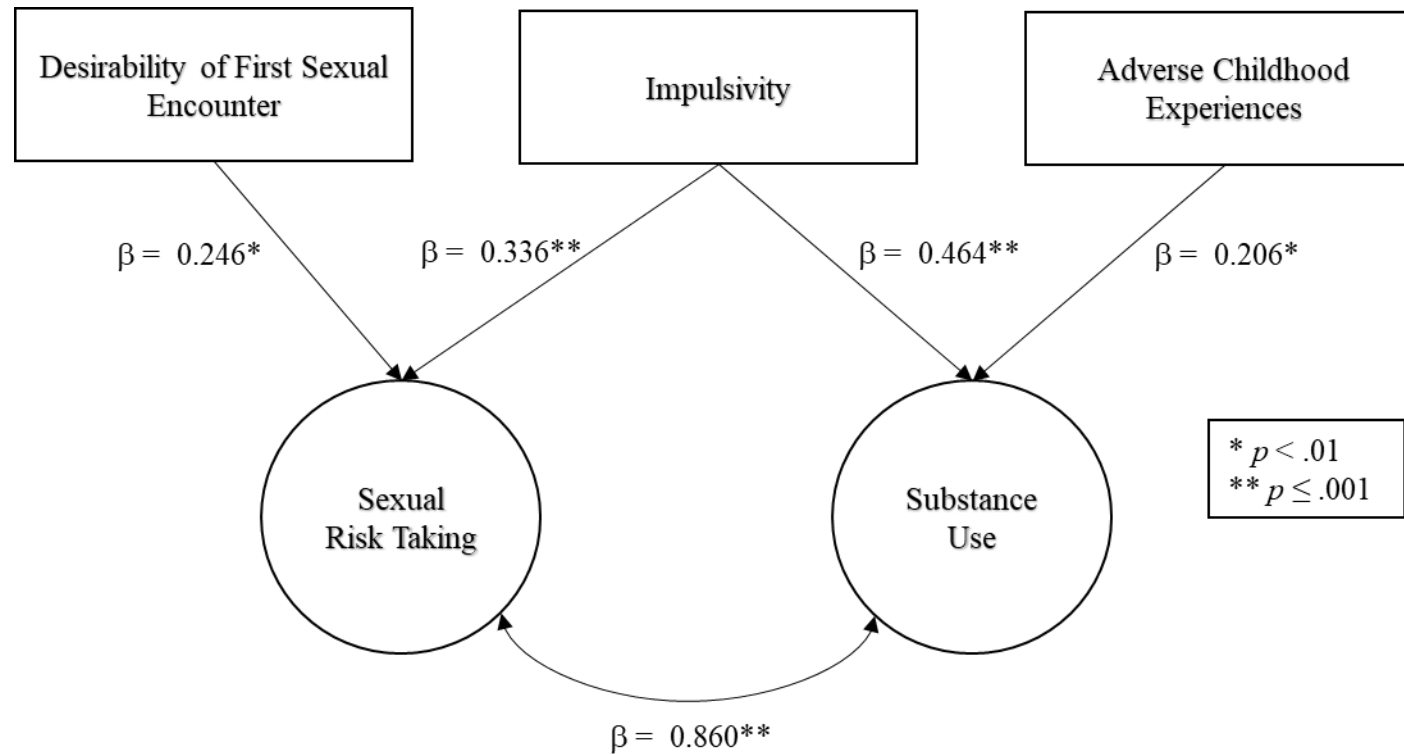
Figure 1. Final Structural Equation Model including exogenous predictors.

Table 3

Unstandardized and Standardized Factor Loadings for Final SEM

	B (SE)	p	β
<u>Sexual Risk Taking By</u>:			
Lifetime Sexual Partners	1.00 (0.00)		0.344
Lifetime: Condom	- 0.045 (0.020)**	p = 0.019	-0.153
Lifetime: Marijuana	0.175 (0.036)**	p < 0.001	0.579
Lifetime: Alcohol	0.213 (0.041)**	p < 0.001	0.695
<u>Substance Use By</u>:			
AUDIT	1.000 (0.00)		0.706
Alcohol/Marijuana Problems	4.787 (0.461)**	p < 0.001	0.695
Illicit Substance Use	0.209 (0.028)**	p < 0.001	.535
<u>Exogenous Predictors</u>			
Risk on Desirability	0.843 (.312)**	p = 0.001	0.246
Risk on Impulsivity	0.281 (0.084)**	p < 0.001	0.336
Substance Use on Impulsivity	0.628 (0.093)**	p < 0.001	0.464
Substance Use on Adverse Childhood Experiences	0.277 (0.091)**	p = 0.002	0.206

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Appendix Q
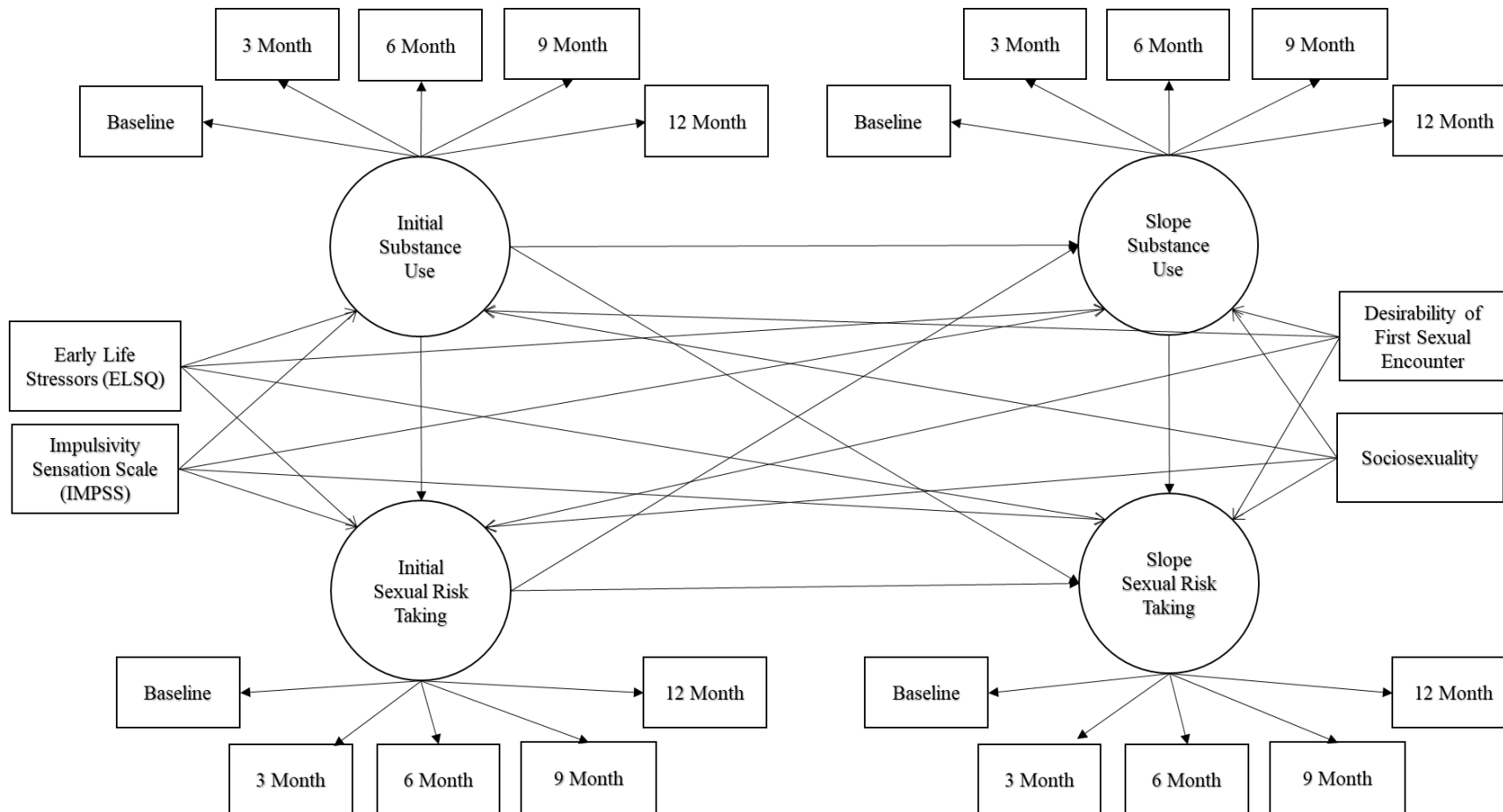**Parallel Process Latent Growth Curve Model**

Figure 2. Proposed Parallel Process Latent Growth Model.

Appendix R
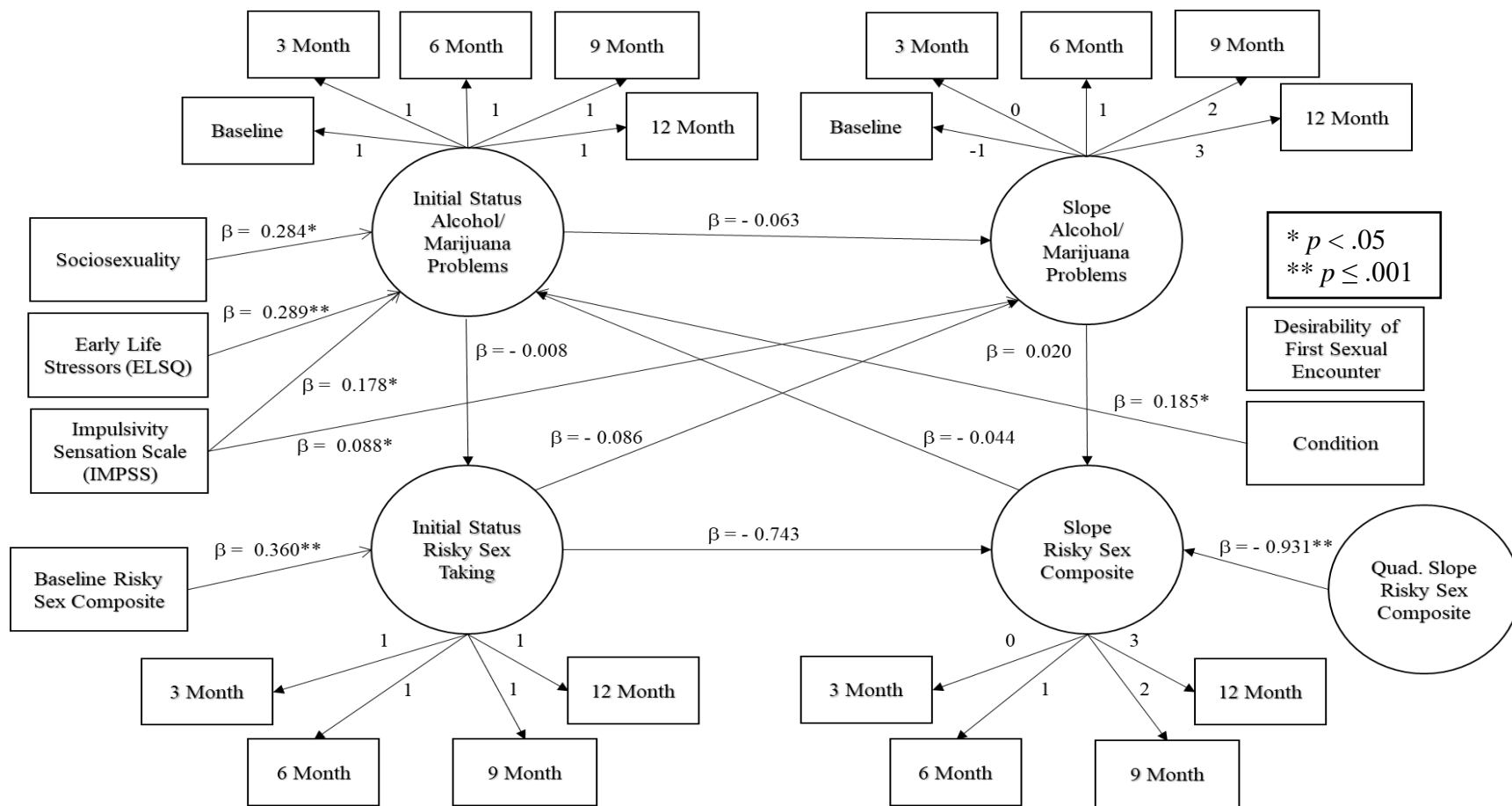**Final Parallel Process Latent Growth Curve Model**

Figure 3. Final Parallel Process Latent Growth Model with Exogenous Predictors.

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