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Effects of Religiosity and Self-Control on At-Risk Adolescent Substance Use and Delinquency

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EFFECTS OF RELIGIOSITY AND SELF-CONTROL ON AT-RISK ADOLESCENT
SUBSTANCE USE AND DELINQUENCY

by

Lauren C. Burns

A Thesis
Submitted to the Graduate School,
the College of Education and Human Sciences
and the School of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts

Approved by:

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ABSTRACT

The adolescent period is one of growth, increased autonomy, and increased risk-taking. Common examples of these risky behaviors include substance use and engagement in delinquent activity. Adolescent substance use and delinquent behavior can lead to a range of negative outcomes, some of which carry into adulthood. These negative consequences are especially evident among at-risk adolescents such as those who have dropped out of school or who come into contact with the juvenile justice system, as these youth often demonstrate higher rates of substance use and delinquent behavior. Understanding the nature and development of these problem behaviors is essential to developing appropriate prevention and intervention tools. In the current study, adolescents' self-control abilities and religiosity were evaluated as predictors of substance use and delinquency. For the purposes of this study, religiosity was defined as a general valuing of religious or spiritual identity (i.e., religiosity is not restricted to Christianity). Adolescent personality domains were also evaluated in relation to substance use and delinquency, as many theories indicate the importance of personality in the development of such problem behaviors. The sample included a local group of at-risk adolescents who have faced academic, educational, vocational, and/or behavioral complications. Results contribute to a greater understanding of the development of problem behaviors during adolescence, especially among at-risk youths.

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DEDICATION

This project is first and foremost dedicated to my son, Briggs Burns Arcement. You have been my greatest strength in the completion of this project. You are my reason to continue striving to reach my academic, career, and life goals. I hope when you are older you look back on these moments and are proud of your mom. I would also like to dedicate this project to my wife, Amanda Arcement. Thank for you continuing to support, motivate, and ground me and thank you for being understanding about the changing demands of my schooling. You are the best mom, wife, and person I know, and you make me want to be better. I could not have done this without your support. I would also like to dedicate this project to Kristen and David Peterson, my wonderful mom and stepdad. You have been my most constant supporters, and for that I am so grateful. Thank you for putting me on the path to accomplish goals like this. I would also like to thank Ireland Alexandra, Neville Francis, and Luna Iris for being the greatest schoolwork buddies I could ask for. Thank you for waking up with me at 4AM to work on this project (even if you did sleep through most of the actual work). Finally, I would like to dedicate this project to my dad, Paul Burns. Dad, I wish you could be here to see this. I know you would be proud.

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CHAPTER 1- INTRODUCTION

Developmentally, adolescence has been described as a time of increased autonomy- seeking. Along with this newfound independence comes an increased interest in experimentation and, subsequently, increased risk-taking (Casey & Jones, 2010). In some instances, this risk- taking surfaces in the form of adolescent substance use and engagement in delinquent activity. While some experimentation with these behaviors is typical, the majority of adolescents do not go on to develop significant substance or delinquency problems in adulthood (Burrow-Sanchez, 2006). A small portion of these youths, however, do develop significant substance or delinquency problems that persist. This vulnerable subgroup is not well-understood and research on the factors associated with risky behaviors during adolescence, as well as any potential mediators in those relationships, could identify ways to prevent the escalation of these problem behaviors into adulthood.

Adolescent Substance Use

The adolescent period is often characterized by experimentation with drug and alcohol use. Although this behavior is not uncommon, it can nonetheless result in significant negative outcomes. Understanding the nuances of adolescent substance use may assist in earlier identification, prevention, and treatment of substance use disorders (SUDs). Further, this information could benefit the general population by reducing costs related to adolescent substance use. For example, over 200,000 youths are admitted to publicly-funded substance abuse treatment programs annually (Hartman, Hopfer, Corley, Hewitt, & Stallings, 2013).

Previous research has established that substance use begins during early

adolescence for many youths. Rates of substance use increase between the ages of 11 and 15, when the prevalence of more frequent (\geq once per month) substance use rises beyond the low single digits (Dishion, 2004). Substance use remains common among older adolescents as well. In a recent national survey, the Center for Disease Control (2017) reported that 60.4% of high school students endorse drinking alcohol at least once during their lifetime, 35.6% report using marijuana at least once during their lifetime, and 5.5% endorse using illicit substances at least once during their lifetime. However, these prevalence rates are not evenly distributed across the adolescent population.

At-risk adolescents demonstrate higher rates of substance use than do youths in the general population (D'Amico, Edelen, Miles, & Morral, 2008). "At-risk" groups include those who have dropped out of high school and those who have had some contact with the juvenile justice system (SAMHSA, 2017). Of adolescents who have been in jail or detained, nearly 24% qualify for an SUD diagnosis. This number is almost triple the 8% diagnosis rate of adolescents who have not had contact with the juvenile justice system (Chassin, 2008). Similarly, in a 2007 study of high school dropout rates and marijuana use, Townsend, King, and Fisher found that 2.2% of non-marijuana users were school dropouts, while 12.8% of chronic marijuana users were school dropouts. These higher-use groups are, therefore, at greater risk of experiencing additional negative outcomes typically associated with substance use.

Substance use is associated with poor academic performance (Cox, Zhang, Johnson, & Bender, 2007; McClelland, Teplin, & Abram, 2004), increased risk of additional maladaptive behaviors such as risky sexual behaviors and cigarette smoking (Chassin, 2008; McClelland, Teplin, & Abram, 2004) increased violent behaviors

(Chassin, 2008), and increased difficulty obtaining a job (Carter, 2019). In addition, early onset of use (i.e. before the age of 15) has an especially significant link to substance use and mental health complications into adulthood (Charles et al., 2015; Charles, Mathias, Acheson, & Dougherty, 2017). These negative outcomes highlight the importance of proper prevention and intervention techniques, especially within the vulnerable at-risk adolescent population.

Adolescent Delinquency

Delinquent behavior can be defined as “behavior that violates basic norms of the society, and, when officially known, evokes a judgment by agents of criminal justice that such norms have been violated” (Cloward & Ohlin, 1960). Typically, delinquent behavior increases in early adolescence, peaks in mid-adolescence, and declines in late adolescence (Levey, Garandean, Meeus, & Branje, 2019; Moffitt, 1993; Odgers et al., 2008). There is, however, a relatively small subgroup of adolescent delinquents whose antisocial behavior extends beyond adolescence and persists into adulthood (Moffitt, 1993). Regardless of the developmental trajectory, adolescent delinquent behavior typically concerns minor, non-violent acts, such as vandalism, graffiti, and shoplifting (Levey, Garandean, Meeus, & Branje, 2019).

In general, adolescents commit only a small portion of the nation’s crime (Federal Bureau of Investigation, 2014). However, this does not dismiss the significance of adolescent delinquency and criminal activity. In 2017, U.S. law enforcement agencies made an estimated 809,700 adolescent arrests, which accounted for nearly 10% of all arrests (Federal Bureau of Investigation, 2014; Office of Juvenile Justice and Delinquency Prevention, 2018). Of those arrests, the majority were for behaviors

typically associated with adolescent delinquency, such as property crimes (approximately 21%), theft (approximately 15%), simple assault (approximately 15%), and drug use violations (approximately 12%) (Office of Juvenile Justice and Delinquency Prevention, 2018). Of those adolescents who are brought to court for issues related to delinquent behavior, 1 in 5 are further detained within the justice system (Office of Juvenile Justice and Delinquency Prevention, 2015). Such rates demonstrate the significance of pursuing a greater understanding of adolescent delinquent behavior.

Similar to substance use behaviors, at-risk adolescents demonstrate higher rates of delinquency. High school dropouts, for example, have higher rates of arrest through age 25, even when controlling for race, age, and social status (Henry, Knight, & Thornberry, 2012). Similarly, Jarjoura (1993) showed that dropping out of school predicts delinquent behavior such as theft, violence, and selling drugs. Of those youth who have had contact with the juvenile justice system, 45 to 72 percent engage in further delinquent behavior and are later convicted of a new offense (No Place for Kids, 2011). This continued involvement in delinquency places the adolescent at greater risk of delinquency-related negative outcomes. Engagement in adolescent delinquency is associated with a range of negative outcomes, such as increased concurrent substance use (Kofler et al., 2011; Mason et al., 2010), criminal activity in adulthood (Mason et al., 2010), concurrent and future academic failure, interpersonal problems, and victimization (Kofler et al., 2011).

Comorbid Adolescent Substance Use and Delinquency

Substance use and delinquency are both associated with health risks and other negative outcomes on their own; additionally, these behaviors often co-occur. The boundary between substance use and delinquent activity is notably nuanced and it is often

difficult to determine the extent of the differences between the two. In many instances, substance use is inherently illegal, and therefore, a source of delinquent activity. In this way, substance use and the act of delinquency may be synonymous. However, research has indicated that the two behaviors (i.e., substance use and delinquent behavior excluding substance use) can occur both individually and/or co-morbidly. More specifically, substance use has been linked to an increased engagement in delinquent behavior over time (Chassin, 2008; Mason & Windle, 2002) and, as a result, an increased risk of contact with the juvenile justice system. In an examination of adolescents detained for criminal offending, 56% of males and 40% of females tested positive for drug use. National data has also demonstrated that the criminal justice system accounted for 55% of male admissions and 39% of female admissions into publicly funded substance treatment programs (Chassin, 2008). The criminal justice system remains one of the nation's primary sources of adolescent substance use treatment, indicating a need for greater understanding of the relationship between adolescent substance use and delinquent behavior. Importantly, the co-occurrence of substance use and delinquency makes adolescents vulnerable to an even wider range of problems than if they had engaged in only one of these behaviors. More specifically, adolescents with comorbid SUDs and externalizing issues (i.e., delinquent behaviors excluding substance use) demonstrate higher levels of criminality and substance use than do youth with only SUDs. Similarly, those with comorbidity display poorer academic achievement, poorer family relations, and greater susceptibility to maladaptive peer influences (Feldstein & Miller, 2006).

Substance Use & Delinquency in Mississippi. Concerning the present study's

chosen population, it is worth noting the prevalence adolescent engagement in substance use and delinquent activity in Mississippi. While detailed, updated reports are difficult to ascertain, the accessible reports provide some insight into the problem behavior occurrence. In 2019, 42% of adolescent arrest records were reported to the Office of Juvenile Justice and Delinquency Program. Of those arrests, 42 were for aggravated assault, 29 for robbery, 439 for larceny, 158 for drug-related crimes, and 60 for weapon-related crimes (OJJDP, 2018). Concerning Mississippi adolescent substance use, reports are generally divided by age (youth 12-17; young adult 18-25). The 2017 Mississippi Behavioral Health Barometer reported current marijuana use in 4.4% of youth and 23.1% in young adults. The report cited current alcohol use in 9.2% of youth. Current alcohol bingeing was reported in 23% of Mississippi young adults. The aforementioned statistics provide two important conclusions. The first is that adolescent substance use and delinquent activity in Mississippi are prevalent enough to warrant further examination. The second conclusion is that substance use increases as adolescents age, suggesting the need for further exploration of the processes underlying the development and maintenance of the problem behavior.

Problem Behavior Theories of Development

Temperament Theories. Several theories of adolescent problem behavior development have been proposed. One such theory concerns childhood temperament, which are characteristics that surface in early childhood and demonstrate some continuity throughout development. These characteristics can be understood as “biologically rooted individual differences in behavior tendencies” (Bates, 1989) that contribute to a child’s adaptation or maladaptation to environmental stimulation (Muris, Meesters, & Blijlevens,

2007; Muris & Ollendick, 2005). In many instances, childhood temperament is a precursor to adult personality (Casey & Jones, 2010).

A key application of this temperament framework to the field of developmental psychopathology concerns identifying child and adolescent liability for substance use and misuse (Martel et al., 2009). Longitudinal studies have demonstrated that core temperament attributes are stable over time, though behavioral manifestations of these attributes change with social and cognitive maturation. Life-span designed studies have been largely consistent in demonstrating that early temperament assessment is related to substance use at a later age. For example, children ages 3-5 were scored for “difficult temperament” syndrome (e.g., low positive mood, high activity) based on parent report and scores were found to be related to engagement in late adolescent substance use, such that higher “difficult temperament” scores were predictive of increased substance use (Wills & Dishion, 2004). Along similar lines of relating temperament to substance use, meta-analyses examining the “Big Five” and “Big Three” personality traits have demonstrated that SUD-diagnosed adults score higher on scales of disinhibition and neuroticism and lower on scales of agreeableness and conscientiousness (Hartman, Hopfer, Corley, Hewitt, & Stallings, 2013). These predictive results support a theory of temperament in understanding the development of adolescent problem behaviors.

Numerous temperamental factors have been associated with emerging substance use and delinquent behavior. Well-cited characteristics include impulsivity (Acheson et al., 2016; Charles et al., 2016; Dougherty et al., 2015), sensation-seeking (Acheson et al., 2016; Charles et al., 2016; Charles, Mathias, Acheson, & Dougherty, 2017), and poor self-control (Gardner, Dishion, & Connell, 2008; Sweeten, Bushway, &

Paternoster, 2009). Sensation seeking can be conceptualized as an interest and willingness to engage in novel, intense experiences. Impulsivity, or the tendency to behave in unplanned ways and without the consideration of potential negative outcomes, is related to sensation seeking in that both can contribute to engagement in risky behaviors (Charles et al., 2016). The interaction of these two traits and their maladaptive consequences may be especially evident during adolescence, when significant changes in sensation-seeking tendencies and impulsivity becomes more evident. In particular, adolescence is a period of increased sensation-seeking. Regarding the relationship between sensation-seeking and substance use, higher levels of sensation-seeking have been associated with mid and late adolescent cannabis use (Crawford, Pentz, Chou, Li, & Dwyer, 2003; Creemers et al., 2010; Teichman, Barnea, & Ravav, 1989). Such changes are occurring at a time when the risk for substance use initiation is significantly increasing, indicating the importance of exploring temperamental traits like impulsivity and sensation-seeking in the analysis of adolescent problem behavior developments (Charles et al., 2016; Steinberg et al., 2008).

Several longitudinal studies have also supported the role of early childhood temperament in the development of externalizing problem behaviors like delinquency (Barnow, Lucht, & Freyberger, 2005; Bates, Pettit, Dodge, & Ridge, 1998; Caspi, Henry, McGee, Moffitt, & Silva, 1995). Cloninger (1987) demonstrated that childhood sensation-seeking can act as a predisposition to engagement in delinquent behavior. There is also extensive evidence that impulsivity is a notable determinant of delinquent behavior (Carroll et al., 2006; Vitacco & Rogers, 2001). Similarly, an early ability to

self-regulate has been linked to externalizing behavior problems, such that children with lower levels of control are more likely to develop such behaviors (van der Voort, Linting, Juffer, Bakermans-Kranenburg, & van Ijzendoorn, 2013).

Self-Control. Multiple components of self-control have also been explored within this realm of temperament research. While a number of field-specific definitions exist, “self-control” is largely understood as an individual’s capacity to intentionally refrain from involvement in behaviors that are immediately gratifying. This refrain is made on the basis of a subsequent expected benefit or in order to conform with social or moral norms (Strayhorn Jr., 2002). Low self-control can be defined as the “inability to resist short-term, easy-to-obtain pleasures and the ability to resist actions that require long-term dedication, commitment, and toil” (Sweeten, Buhway, & Paternoster, 2009).

While the exact mechanisms underlying the relationship between self-control abilities and initiation of problem behavior remain somewhat unclear, it has been proposed that self-control abilities serve as a moderator in the association between socialization processes, such as peer and family environments, and the development of problem behaviors. This framework suggests that the characteristics of children (i.e., self-control abilities) can potentially alter the impact of maladaptive parenting and peer influences that are so often associated with increased substance use (Wills and Dishion, 2004). In this sense, enhanced self-control abilities are expected to serve as a protective factor against negative environmental influences. However, low self-control may serve to increase risk for negative outcomes.

Individuals with low self-control are more likely to engage in maladaptive behaviors, such as delinquent activity and substance use (Sweeten, Buhway, &

Paternoster, 2009).

Evaluations of self-control are especially relevant during the adolescent stage, when youth are seeking greater autonomy and control (Casey & Jones, 2010).

Regarding specific findings, research has demonstrated that poor self-control abilities are related to increased affiliation with substance-using peers (Creemers et al., 2010).

Additionally, poor self-control has been shown to predict initiation and frequency of substance use (Wills & Cleary, 1999) as well as delinquent behavior (Van Gelder, Hershfield, & Nordgren, 2013), such that adolescents with less-developed self-control engage in more frequent substance use at an earlier age and are more likely to engage in delinquent activities.

Social Theories. Adolescent problem behaviors have also been explored within the context of social theories. It has been well-observed that adolescents tend to cluster together based on shared values and activities. This is evident across both pro and anti-social activities, such as religious affiliation and substance use, respectively. For example, youth engaged in substance use are often surrounded by friends, family members, and other associates who are also engaged in such behaviors. Cross-sectional evidence suggests that increased peer illicit drug use and alcohol use are associated with an adolescent's own increased illicit drug and alcohol use (Windle, 2000).

Longitudinal studies also indicate that higher rates of peer substance use are associated with higher rates of adolescent substance use (Rice, Donohew, & Clayton, 2003; Valente, Gallaher, & Mouttapa, 2004). These findings demonstrate the significance of the social environment in understanding the development of adolescent problem behavior.

One theory often cited to provide an understanding of this socializing effect is social learning theory (Bandura, 1986). In accordance with this theory, individuals tend to engage in behaviors as a result of modeling significant others' behaviors. This can then present as both pro- social and anti-social behaviors. Religiosity and engagement in religious communities, for example, can serve as an example of pro-social influences of social learning in relation to substance use and engagement in criminal activity. Conversely, engagement in substance use and delinquent activity may be a result of anti-social learning. In these instances, youth may gain an interest in substance use or delinquent activity merely from observing others who appear to receive rewards for engaging in the problem behaviors (Bandura, 1986).

Religiosity & Social Theories of Problem Behavior Development. Elements of religiosity may be incorporated into social theories of problem behavior development. Specifically, the relevance of religiosity can be understood in relation to social capital, meaning religiosity offers enhanced organizational and social ties. These enhancements, such as networking opportunities and community resources, are proposed sources of influence over adolescent behavior (Smith, 2003). Adolescents who engage in religious involvement are further integrated into prosocial communities, deterring them from engagement in problem behaviors by way of social control. With this notable relationship between religious engagement and prosocial opportunities in relation to the present problem behaviors, it is expected that religiosity can act as a buffer toward engagement in substance use and juvenile justice involvement. This buffering effect may be especially valuable in at-risk populations, as religious communities and resources have shown to be an important source of social capital for youth facing higher-risk,

resource-strained environments (Salas-Wright, Lombe, Nebbitt, Saltzman, & Tirmazi, 2018).

Religiosity and Self-Control. Religiosity has also been linked to decreased problem behavior by means of the promotion of self-control. As previously explained, self-control can play an integral part in the development of adolescent substance use and delinquent activity. By promoting aspects of self-control and self-regulation, religiosity may serve to decrease the likelihood of engagement in problem behaviors (McCullough & Willoughby, 2009; Salas-Wright, Lombe, Nebbitt, Saltzman, & Tirmazi, 2018).

Research suggests that religious involvement may enhance self-control by means of cognitive-based and behavior-driven pathways. Regarding cognitive pathways, religious traditions typically promote communal narratives and behavioral proscriptions that value self-discipline, moral behavior, and self-control (Johnson, 2011; Salas-Wright, Lombe, Nebbitt, Saltzman, & Tirmazi, 2018; Smith, 2003). In terms of behavioral pathways, religiosity promotes self-control by encouraging involvement in regular, disciplined practices. Such practices typically include prayer/meditation, charitable giving and service, and engagement in public religious services (Smith & Denton, 2005). If practiced consistently, research suggests that these cognitive and behavioral pathways may assist people in enhancing their capacity for self-control, thereby decreasing their engagement in problem behaviors, such as substance use and delinquent activity (Salas-Wright, Lombe, Nebbitt, Saltzman, & Tirmazi, 2018).

Religiosity in Mississippi. Relative to other states, Mississippians are more religious (Pew Research Center, 2015). In the 2014 “Religious Landscape Study,” researchers compared state rates of religiosity and religious engagement. Results

indicated that 82% of adult Mississippi residents hold an “absolutely certain” belief in god. This rate was the highest in the nation. Similarly, 74% of adult Mississippians rated the importance of religion as “very important” (highest possible rating), which was the second highest percentage across states. Regarding frequency of prayer, 75% of polled residents reported praying “at least daily,” again the highest rate in the nation. When asked to rate primary sources of guidance on “what is wrong and what is right,” 50% reported religion as their most important source of guidance, the highest rate across the country (Pew Research Center, 2015). These results suggest that the significance of religiosity in the daily life of Mississippi residents cannot be ignored and should be considered when exploring moderating and buffering influences on problem behaviors.

Current Study

The overall aim of this study was to explore relationships between self-control, religiosity, delinquent behavior, and substance use among at-risk adolescents. In terms of specific goals, this study sought to examine: (1) the effect of religiosity and self-control on frequency of delinquent behavior and (2) the effect of religiosity and self-control on frequency and type of substance use. The geographical location of the study population, who hail from all areas of the state of Mississippi, offers unique opportunities for evaluating the role of religiosity in relation to problem behaviors.

This study posed several hypotheses: (H1) higher self-control will be associated with less delinquent behavior, (H2) higher religiosity will be associated with less delinquent behavior, (H3) higher self-control will be associated with less substance use, (H4) higher religiosity will be associated with less substance use, (H5) adding religiosity to the delinquency model will provide more predictive power than self-control alone, (H6)

adding religiosity to the substance use model will provide more predictive power than self-control alone, (H7) self-control will mediate the relationship between religiosity and delinquency, (H8) self-control will mediate the relationship between religiosity and substance use, (H9) the model including self-control and religiosity as predictors of delinquency will remain significant after controlling for personality data, and (H10) the model including self-control and religiosity as predictors of substance use will remain significant after controlling for personality data.

CHAPTER I - METHODOLOGY

Methods

Setting. Study participants were recruited from a military-style residential program in Mississippi. The program is one of 40 nationwide sites to serve as a federally funded intervention for at-risk adolescents. This “at-risk” status includes adolescents who have dropped out of high school and are unemployed, those who are significantly behind in grade level, and/or those who have demonstrated some behavioral complications. The primary function of this program is to increase the number of adolescents who earn a GED and continue onto higher education, employment, or military training. To meet these goals, the program offers high school and college courses, physical training, disciplinary training, and vocational training opportunities. The program spans 5 ½ months and it is not associated with the criminal justice system.

Participants. The original dataset (N=131) was composed of data collected from adolescents in the Fall 2019 cohort of the aforementioned residential program. Participants were majority male and with ages ranging from 16 to 19, as this is the typical composition of youths at the program where data collection will take place.

Materials

Demographics

Demographic information was obtained through self-report questions asking participants to identify their age, sex, race/ethnicity, and highest completed education level.

Substance Use

Adolescent substance use was measured via the 2015 version of the Youth Risk Behavior Surveillance Survey (YRBSS; CDC, 2015). The YRBSS was originally created

in 1990 as a survey of adolescent and adult health risk behaviors in the United States. This self-report measure offers an array of health risk behavior questions, but questions related to the lifetime frequency of substance use were utilized for the purposes of this study. Participants were grouped into the following lifetime frequency categories for analyses: nonusers (report never using substances), low frequency users (report using substances on 1-10 occasions), and high frequency users (report using substances on 10+ occasions). The frequency categories used for this variable were difficult to standardize across the various substance use outcomes, as determining a problematic level of substance use may depend on the type of substance in question. The chosen groups were selected because all substance use frequency items included response options of “0,” “1-2,” “3-9,” and “10-19.” Frequency response options beyond “10-19” varied across substance use items (i.e., the highest possible alcohol consumption frequency was “100+” while the highest possible ecstasy use frequency was “40+”). Therefore, the resulting frequency categories were chosen only as a means of creating comparable group ranges.

Religiosity.

Participant religiosity was assessed with the Santa Clara Strength of Religious Faith Questionnaire (SCSORF; Plante & Boccaccini, 1997). This brief self-report questionnaire is comprised of 10 items that are designed to provide a quick assessment of participant’s strength of religious faith. SCSORF items assess various domains of faith, including the importance of religion, public religious engagement, and private religious engagement. Questions are posed in a way that is applicable to any and all religious denominations or affiliations. Sample items include “I look to my faith as a source of inspiration” (item #3) and “My faith impacts many of my decisions” (item #10). The

scale uses a 4-point Likert scale that ranges from (1) “Strongly Disagree” to (4) “Strongly Agree.” Item scores are summed to yield a total score, ranging from 10 to 40. Higher aggregate scores reflect stronger levels of strength of religious faith.

Self-Control

Self-control was assessed via the Self-Control Scale (Tangney, Baumeister, & Boone, 2004). The 36-item self-report questionnaire encompasses multiple components of self-control, including emotional control, control over thoughts, performance regulation, habit breaking, and impulse control. Sample items include “I am good at resisting temptation” (item #1), “I spend too much money” (item #14), and “I do many things on the spur of the moment” (item #20). Items are rated on a 5-point Likert scale, ranging from (1) “Not at all like me” to (5) “Very much like me.” Of the 36 items, 24 are reverse scored. Individual item scores are then summed and averaged to provide a final score, which ranges from 1 to 5. Higher scores are indicative of greater self-control.

Delinquency

Engagement in delinquent activities was measured with the Self-Report Delinquency (SRD) scale (Elliot & Ageton, 1980). The SRD was developed based on a list of offenses included in the Uniform Crime Report. Only offenses with a juvenile base rate greater than 1% were included (Elliott & Huizinga, 1984). The resulting scale includes 34 items that assess a range of delinquent behaviors (e.g., theft, property damage, crimes against persons, etc.). Participant responses (“yes”/“no”) to individual items are summed to create a composite score of total number of delinquent acts committed. Final scores range from 0-34, with higher scores indicating higher levels of delinquency.

Personality

Participant personality was measured via the Big Five Inventory-10 (BFI-10; Rammstedt & John, 2007). This is a 10-item scale intended to measure the well-cited Big Five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). The BFI-10 was developed as a shorter, more accessible version of the Big Five Inventory-44 (John, Donahue, & Kentle, 1991). The BFI-10 has demonstrated acceptable reliability, validity, and correlations with similar personality assessments (Rammstedt & John, 2007; Balgiu, 2018). The measure provides 5 subscale scores, one for each intended personality domain. Higher subscale scores are indicative of stronger personality trends.

Procedure

The study was reviewed and approved by USM's Institutional Review Board, as well as the residential program's administrators. Participants aged 18 years and above provided informed consent. Participants under 18 years of age provided assent. The program director, who serves as guardian *ad litem* for the younger residents, provided informed consent for youths. All participants were part of a larger study that collects data from group testing sessions. The data collection spanned across 2 testing sessions, with the first session assessing delinquency, self-control, and religiosity. The second session assessed substance use. Each session lasted approximately 45 minutes, during which research assistants were available to answer any participant questions. Each consenting participant was provided with a unique ID number to enter as they complete the surveys. This number was used in place of their name in order to maintain anonymity. All data was collected via Qualtrics online survey software, available on

computer workstations at the residential program.

Data Analyses

Preliminary correlations and t-tests were used to examine the effects of demographic variables. Significant results were included in further analyses as needed. To test the hypotheses that higher self-control is associated with less delinquent behavior (H1), higher religiosity is associated with less delinquent behavior (H2), higher self-control is associated with less substance use (H3), and higher religiosity is associated with less substance use (H4), correlations were conducted. To test the hypothesis that adding religiosity to the delinquency model provides greater predictive power than self-control alone (H5), hierarchical linear regressions were used. To test the hypothesis that adding religiosity to the substance use model provides greater predictive power than self-control alone (H6), ordinal logistic regressions were used. To test the hypotheses that self-control mediates the relationship between religiosity and delinquency (H7) and religiosity and substance use (H8), mediation models were conducted via PROCESS. To test the hypothesis that the model including self-control and religiosity as predictors of delinquency will remain significant after controlling for personality data (H9), hierarchical linear regressions were used. To address the hypothesis that the model including self-control and religiosity as predictors of substance use will remain significant after controlling for personality data (H10), ordinal linear regressions were used.

CHAPTER II - RESULTS

Results

Of the original data set, 7 participants submitted notably insufficient or missing data concerning reported delinquency, self-control, and religiosity. These participants were excluded from follow-up analyses. Further, 20 participants did not attend the second testing session and, therefore, did not complete the self-report measure of substance use. After excluding these two groups for inadequate/missing data (noting that some participants were members of both exclusion groups), the resulting data set included 105 participants. The final data collection was considered sufficient according to the results of post hoc power analyses which indicated a sample size of 105 would be adequate to detect a moderate-to-large association at 80% power (Cohen, 1992).

Descriptive Data

Descriptive data was examined in order to better understand the potential relationship between substance use, delinquency, self-control, and religiosity. Results indicated that the sample size was composed of primarily male participants (80.6%). Participants were primarily white (57.3%) or black (22.6%) (Table 1). Regarding substance use, the majority of participants reported using in the following substances at some point in their lifetime: alcohol (66.1%) and marijuana (64.5%). More detailed information about the sample is available in Table 1. Additionally, group specific (i.e., none, low, high) substance use descriptives are provided in Table 2. Of alcohol-users, a majority reported a “high” level of lifetime use (64.6%). Similarly, a majority of marijuana-users reported a “high” level of lifetime use (87.5%). Of participants who

endorsed consuming prescription drugs recreationally, a majority reported a “high” level of lifetime use (53.6%).

One-Way ANOVAs were then used to determine if demographic differences existed among all variables. To account for the notably small number of participants who reported being of multiracial or “other” race, participants were divided into “white” and “nonwhite” for the completion of these analyses. No significant demographic differences were noted across variables. As such, no demographic variables were included in follow-up analyses.

To test hypotheses 1-4, bivariate correlations were then conducted across self-control, religiosity, delinquency, and substance use (Table 3). Results indicated a positive correlation between the following: self-control and religiosity, delinquency and alcohol use, delinquency and marijuana use, delinquency and cocaine use, delinquency and inhalant use, delinquency and ecstasy use, delinquency and hallucinogen use, and delinquency and recreational prescription drug use. Negative correlations were noted between the following: self-control and delinquency, religiosity and delinquency, self-control and alcohol use, and self-control and cocaine use.

Delinquency Regressions. Hierarchical linear regression models were conducted to address hypothesis number 5 (Table 4). The predictor variables were tested to verify there was no multicollinearity, and this was confirmed. As an independent predictor of delinquency, self-control was statistically significant and accounted for 14.4% of the variability ($F(1, 103) = 17.288, p < .001, R^2 = .144$). After adding religiosity to the model, the resulting second model was also significant ($F(2, 102) = 9.621, p < .001, R^2 =$

.159). While the second model successfully accounted for 15.9% of the variability in delinquency, the change in R^2 between models was nonsignificant ($p = .181$).

Substance Use Regressions

Ordinal logistic regressions were used to address hypothesis number 6 (Table 5). The predictor variables were again tested to verify there was no multicollinearity, and this was confirmed. Self-control was entered as the first predictor, followed by religiosity. Self-control was a statistically significant predictor of both alcohol use and cocaine use. For every one unit increase in self-control, the log odds of moving into a higher alcohol frequency group decreased by .04 ($b = -.038$, $SE = .013$, $OR = 0.96$, $p = .004$). Further, the self-control model accounted for 8.8% of the variance in alcohol consumption frequency. For every one unit increase in self-control, the log odds of being in a higher cocaine frequency group decreased by .03 ($b = -.034$, $SE = .016$, $OR = 0.97$, $p = .038$). The self-control model accounted for 5.6% of the variance in cocaine consumption frequency. Self-control was not a significant predictor of membership in any of the other substance use groups. The addition of religiosity to the models did not notably alter the pattern of results.

Self-Control Mediations.

To address hypotheses 7 and 8, mediation models were conducted via PROCESS. Across all mediation models, religiosity was significantly related to self-control ($b = .4398$, $SE = .1876$, $p = .0210$). In the model assessing delinquency as the outcome (Figure 1), the direct path between self-control and delinquency was significant ($b = -.1686$, $SE = .0448$, $p = .0003$), while the direct path between religiosity and delinquency was not significant ($b = -.1180$, $SE = .0875$, $p = .1807$). The indirect effect of the model was

statistically significant (95% CI = (-.1500, -.0208)). Concerning substance use mediation models, the direct path was statistically significant for the following: self-control and alcohol consumption (Figure 2; $b = -.0165$, $SE = .0053$, $p = .0024$) and self-control and cocaine use (Figure 3; $b = -.0078$, $SE = .0039$, $p = .0453$). The indirect path was statistically significant for the model predicting alcohol consumption (95% CI = (-.0120, .0291)). No other indirect paths for substance use mediation models were statistically significant.

Personality Data

Follow-up analyses were conducted to include results from the personality assessment as model covariates. No significant demographic differences were noted on personality assessment results. Concerning correlations across personality data and the independent variables (Table 6), positive correlations were noted between self-control and openness to experience, self-control and conscientiousness, self-control and agreeableness, religiosity and conscientiousness, and religiosity and agreeableness. A negative correlation was noted between self-control and neuroticism. A positive correlation was noted between openness to experience and hallucinogen use. No significant correlations were found between personality assessment data and delinquency or the remaining substances.

Hierarchical linear regressions were re-conducted to include the five personality domains as covariates and address hypothesis number 9. Models included self-control and religiosity as predictors and delinquency as the outcome. After controlling for personality data, the original, simpler models remained significant, indicating the results

reported above were not significantly impacted by the inclusion of personality variables (Table 7).

Ordinal logistic regressions were re-conducted to include personality data as covariates and address hypothesis number 10. The originally significant models including self-control and alcohol use and self-control and cocaine use remained significant after controlling for personality data, indicating the addition of personality factors did not notably alter the effects reported for the original models (Table 8).

CHAPTER IV - DISCUSSION

The current study evaluated multiple aspects of adolescent problem behaviors and their predictors and contributors. The study first aimed to examine the relationship between self-reported religiosity and self-control in relation to two problem behaviors (substance use and delinquency). The study also aimed to explore the mediating role of self-control in a model of religiosity as a predictor of said problem behaviors. Further, the present study examined whether controlling for participant personality factors impacted the associations between predictors and outcomes.

Multiple hypotheses were posed concerning the relationship between the indicated dependent and independent variables. Higher self-control scores were hypothesized to be associated with less delinquent behavior and less substance use. Similarly, higher religiosity scores were expected to be associated with less delinquent behavior and less substance use. Further, it was hypothesized that adding religiosity to models including self-control would provide more predictive power than would models with self-control as the only predictor. Self-control was also hypothesized to mediate the relationship between religiosity and the problem behaviors. Finally, it was hypothesized that the inclusion of personality data would not drastically alter the results of the original models, meaning self-control and religiosity models would remain significant predictors of adolescent delinquency and substance use even when personality factors were added as a covariate.

The first hypothesis was fully supported. Results indicated that higher self-control scores were associated with less reported delinquency. Existing research has demonstrated a similar relationship between self-control and engagement in delinquent

activities. As reported in numerous studies, individuals with diminished self-control skills are more likely to engage in problematic behaviors, including delinquent activity (Sweeten, Buhway, and Paternoster, 2009; Meldrum, Miller, and Flexon, 2013; Meldrum, Barnes, Hay, 2015). Hypotheses number 2 was also fully supported. Results were consistent with previous research citing the negative relationship between religiosity and delinquent behavior (see Johnson, De Li, Larson, & McCullough, 2000 for a review of the literature). The present study, then, provides support for well-cited findings suggesting the significant role of adolescent self-control in the development and display of maladaptive behaviors such as delinquent activity. Results also provide support for religiosity as a protective factor in the development of such problem behaviors.

Hypothesis number 3 was partially supported. Higher self-control scores were only significantly associated with less reported alcohol and cocaine use. As such, the association between self-control and a majority of the substances assessed was non-significant. This result suggests that self-control may be most relevant to alcohol and cocaine use patterns. Previous research has found similar findings concerning cocaine use and self-control (Goldstein et al., 2007; Fillmore & Rush, 2002) and the moderating effect of self-control on adolescent alcohol use (Wills et al., 2010; Koning et al., 2011). In sum, such findings support the notion that enhancing adolescent self-control abilities and offering inhibitory control interventions may be useful in decreasing engagement in cocaine and alcohol use.

The non-significant relationships between self-control scores and the remaining 10 substance use items were notable considering previous research has demonstrated the

negative relationship between these two variables (Ford & Blumenstein, 2013; Wills & Stoolmiller, 2002; Wills & Dishion, 2004). The present study's non-significant findings related to these hypotheses may be related to a number of factors. For example, the somewhat restricted sample size may contribute to the inability to detect a significant relationship. While the resulting associations were in the expected direction, their magnitude was not large enough to be statistically significant in the present sample. It is expected, then, that some significant relationships between self-control and substance use might be observed if a larger sample size were pursued. Similarly, some substances were used fairly infrequently in the sample, such that very few participants reported "high" use (e.g., high cocaine use = 5.7% of users, high methamphetamine use = 5.7% of users, high inhalant use = 3.8% of users, etc.). The restricted range of use for many types of illicit substances like affected the ability to detect factors associated with membership in the higher use groups. The nature of the current sample may have further contributed to the nonsignificant findings, as it contains at-risk adolescents in a residential program. Much of the research related to the proposed hypotheses was conducted within the general population (typically, student population; e.g., Ford & Blumenstein, 2013; Wills et al., 2006). The participants in the present study may feature characteristics very different than the typical (i.e., general) population that could have impacted results.

Concerning the relationship between religiosity and substance use, the proposed hypothesis was not supported. No significant correlations were noted between reported religiosity and substance use. This result is inconsistent with previous research, which largely indicates the significantly negative relationship between substance use and

identification with religious values (Wills, Yaeger, & Sandy, 2013; Ford & Hill, 2012). This inconsistency is notable and may be the result of similar limitations presented in the self-control hypotheses. The limited sample size may have contributed to the non-significant religiosity results. Further, the at-risk status and therefore unique characteristics of the present sample may have contributed to findings that are inconsistent with similar research. The scope of the religiosity self-report measure utilized in the study may have also contributed to the non-significant relationships. As previously expressed, the concept of “religiosity” can vary widely in definition and therefore may be difficult to standardize across studies. A re-creation of the present study with a different measurement of religious identity may produce significant results that are more similar to existing research indicating the inverse relationship between religiosity and substance use.

The study hypothesis suggesting the beneficial addition of religiosity to a model of self-control as a predictor of delinquency was not supported. The intention of this proposal was to reflect the literature indicating self-control and religiosity as independent, significant predictors of the problem behaviors (e.g., Sweeten, Buhway, & Paternoster, 2009; Desmond, Ulmer, & Bader, 2013, etc.). The combination of these predictors was expected to result in enhanced predictive power. While both models (i.e., self-control as an individual predictor and self-control and religiosity as paired predictors) were statistically significant, the increase in predictive power between the two models was not significant. This non-significant result indicates that religiosity, as measured in the current study, does not provide meaningful information that aids in the prediction of substance use patterns beyond what can be predicted by self-control. This result may

reflect the lack of significant relationships demonstrated between religiosity and majority of the problem behavior outcomes.

Similar to the results of hypothesis number 5 analyses, hypothesis number 6 was not supported. The addition of religiosity to the self-control model predicting substance use (across all outcomes) did not provide additional predictive power. These findings highlight the importance of the promotion of self-control skills in adolescence in order to decrease the likelihood of engagement in problem behaviors, such as substance use and delinquent activity.

Hypothesis number 7 was fully supported. PROCESS results indicated that self-control successfully mediates the relationship between religiosity and delinquency in a negative direction. Conceptually, this result suggests that, while religiosity appears to influence delinquency (see results from hypothesis number 2), it does so through increased self-control. Results are consistent with previous research that suggests the mediating role of self-control (Vitell et al., 2009; Desmond, Ulmer, & Bader, 2013). Results also further highlight the relationship between self-control and religiosity. As previously stated, research suggests that religious engagement/identity can be a means for developing and enhancing self-control skills.

The hypothesis suggesting the mediating role of self-control in models predicting substance use was partially supported. Self-control only mediated the relationship between religiosity and alcohol consumption. The non-significant mediations associated with the remaining substances are likely a reflection of the previously demonstrated non-significant relationships between religiosity and substance

use outcomes. Without significant associations between the predictor and outcome variables, a significant indirect effect cannot be created.

Hypotheses number 9 and 10 were fully supported. Regression models indicated that the inclusion of personality factors did not negatively impact the results reported for hypotheses number 5 and 6 (i.e., the originally significant models remained significant after controlling for personality domains). These results support the previously-cited research that indicates the significance and utility of self-control and religiosity as predictors of substance use and delinquency.

Limitations & Future Directions

The present study is not without limitations. The most notable limitation is related to the characteristics of the current sample. The participants were predominantly male and white, and the at-risk status of the sample is a niche population. Because of these characteristics, the study results may not generalize to other, more typical populations. Future research should expand on the diversity of the sample population. Doing so would likely enhance the generalizability and utility of the results. Diversity expansion could occur in multiple ways, though extending the sample to include more female, non-white participants, and adolescents in the general population (i.e., not within a residential-style military program), may provide for the most generalizable results. Results may be especially useful if they are compared to the present study results, as some of the presented findings are inconsistent with previous research citing similar analyses in the general population.

The present study is also limited by the retrospective nature of the data collection. Participants were asked to reflect on their behaviors prior to entering the residential

facility, which was a span of several months. to further complicate the information recall, many self-report items inquired about lifetime experiences (e.g., number of times a substance was used across lifetime). Having to reflect and report on lifetime experiences was likely not as accurate as if the data were collected in real-time. Future research may consider ways in which the current outcomes variables can be reported in real-time, or at the very least within a shorter timeframe.

The most significant contribution toward future research may be the study's findings on the relationship between self-control and problem behaviors. As demonstrated across multiple analyses, self-control skills are an integral piece of adolescent substance use and delinquency behaviors. Results further suggested that self-control skills may be developed and enhanced through religious engagement. Future research may consider exploring additional ways in which self-control can be developed and/or enhanced beyond religious involvement. This information could provide useful prevention and intervention considerations for targeting adolescent problem behaviors, including substance use and engagement in delinquent activity.

APPENDIX A – Tables & Figures

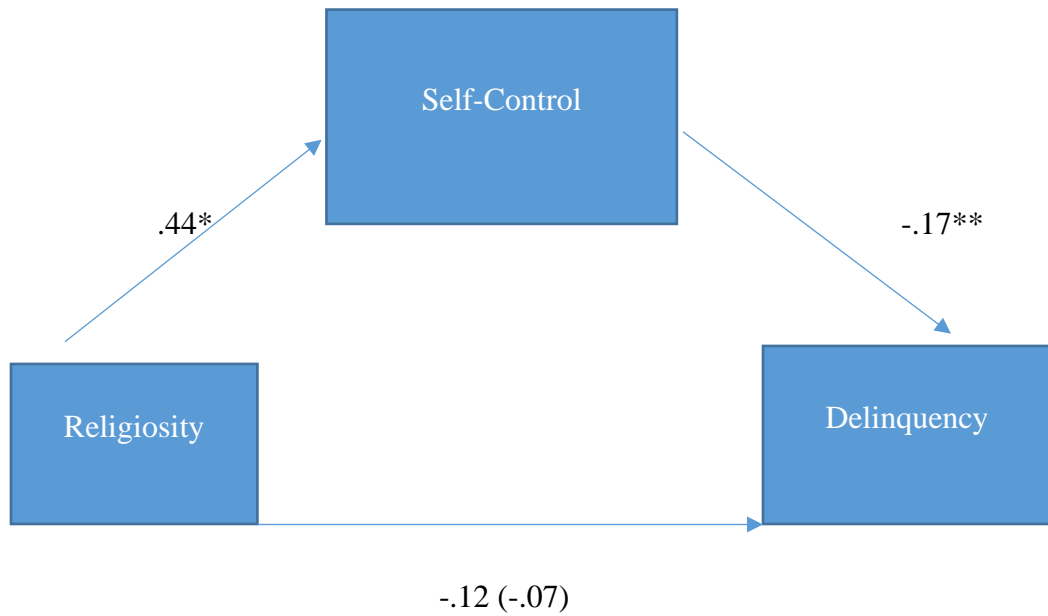


Figure 1. PROCESS results for the relationship between religiosity and delinquency, mediated by self-control; *Note: * = $p < .05$; ** = $p < .01$*

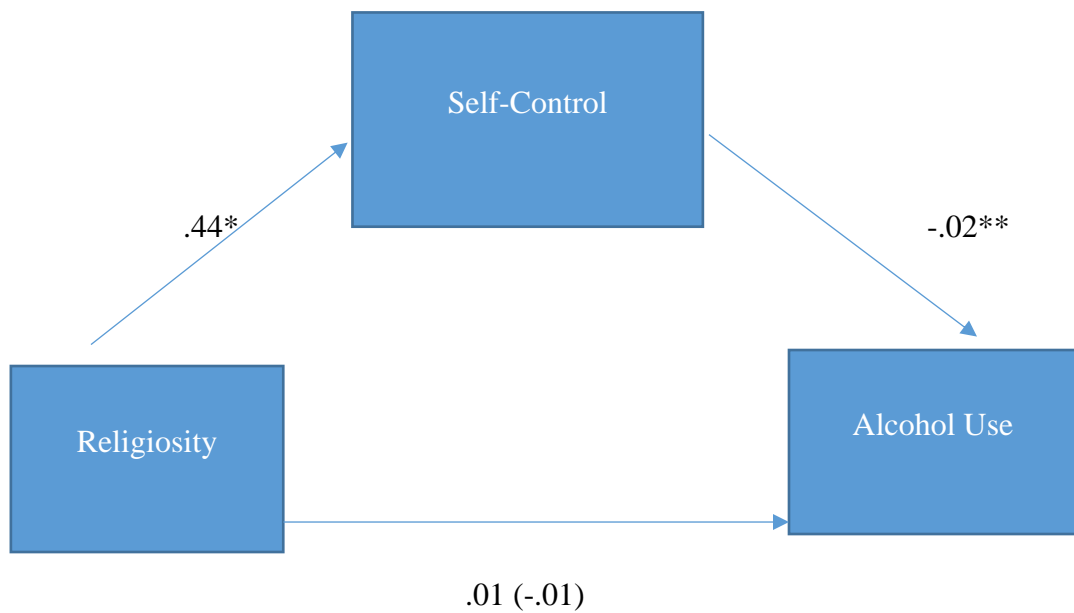
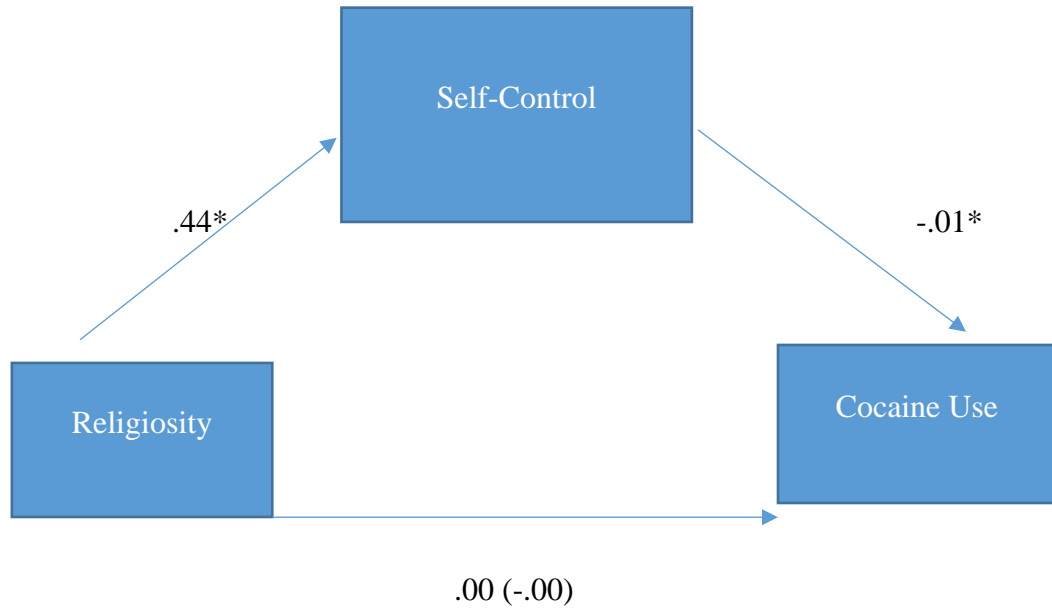


Figure 2. PROCESS results for the relationship between religiosity and alcohol use, mediated by self-control; *Note: * = $p < .05$; ** = $p < .01$*



*Figure 3. PROCESS results for the relationship between religiosity and cocaine use, mediated by self-control; Note: * = $p < .05$; ** = $p < .01$*

Table 1 *Table 1. Demographics & descriptives*

| | N (%) |
|-------------------------------------|-----------|
| Sex | |
| <i>Male</i> | 87 (82.9) |
| <i>Female</i> | 18 (17.1) |
| Ethnicity | |
| <i>Caucasian</i> | 64 (61.0) |
| <i>African American</i> | 28 (26.7) |
| <i>Multiracial</i> | 3 (2.9) |
| <i>Other</i> | 10 (9.6) |
| Lifetime Substance Use (yes) | |
| <i>Alcohol</i> | 82 (78.1) |
| <i>Marijuana</i> | 80 (76.2) |
| <i>Cocaine</i> | 26 (24.8) |
| <i>Inhalants</i> | 29 (27.6) |
| <i>Heroin</i> | 17 (16.2) |
| <i>Methamphetamines</i> | 20 (19.0) |
| <i>Ecstasy</i> | 29 (27.6) |
| <i>Hallucinogen</i> | 34 (32.4) |
| <i>Synthetic marijuana</i> | 36 (34.2) |
| <i>Steroids</i> | 18 (17.1) |
| <i>Unprescribed prescription</i> | 56 (53.3) |

Table 1 Continued

| | |
|-----------------------------|--------------|
| <i>Injection substances</i> | 14 (13.3) |
| | M (SD) |
| Age | 16 (.71) |
| Self-Control | 111.3 (14.8) |
| Religiosity | 27.8 (7.6) |
| Delinquency | 12.6 (7.1) |
| Openness to experience | 6.6 (1.5) |
| Conscientiousness | 7.3 (1.8) |
| Extraversion | 6.6 (1.6) |
| Agreeableness | 6.7 (1.7) |
| Neuroticism | 6.1 (1.8) |

Table 2 Table 2: Substance use frequency group descriptives

| | None | Low | High |
|-----------------|-----------|-----------|-----------|
| | N (%) | N (%) | N (%) |
| Alcohol | 23 (21.9) | 29 (27.6) | 53 (50.5) |
| Marijuana | 25 (23.8) | 10 (9.5) | 70 (66.7) |
| Cocaine | 79 (75.2) | 20 (19) | 6 (5.7) |
| Inhalants | 76 (72.4) | 25 (23.8) | 4 (3.8) |
| Heroin | 88 (83.8) | 15 (14.3) | 2 (1.9) |
| Methamphetamine | 85 (81) | 14 (13.3) | 6 (5.7) |

Table 2 Continued

| | | | |
|---------------------------|-----------|-----------|-----------|
| Ecstasy | 76 (72.4) | 19 (18.1) | 10 (9.5) |
| Hallucinogens | 71 (67.6) | 23 (21.9) | 11 (10.5) |
| Synthetic marijuana | 69 (65.7) | 22 (21) | 14 (13.3) |
| Steroid | 87 (82.9) | 14 (13.3) | 4 (3.8) |
| Unprescribed prescription | 49 (46.7) | 26 (24.8) | 30 (28.6) |
| Injection substances | 91 (86.7) | 14 (13.3) | 0 (0) |

Table 3 *Correlation results of self-control, religiosity, delinquency, and substance use*

| | Pearson Correlation | | |
|------------------|----------------------------|-------------|-------------|
| | Self-Control | Religiosity | Delinquency |
| Self-Control | | . | |
| Religiosity | .270** | | |
| Delinquency | -.428** | -.228* | |
| Alcohol | -.195* | -.052 | .467** |
| Marijuana | -.114 | -.071 | .411** |
| Cocaine | -.195* | .019 | .233* |
| Inhalants | -.112 | -.037 | .241* |
| Heroin | -.032 | -.058 | .037 |
| Methamphetamines | -.101 | .022 | .152 |
| Ecstasy | -.078 | -.004 | .228* |

Table 3 Continued

| | | | |
|---------------------|-------|-------|--------|
| Hallucinogen | -.063 | -.082 | .198* |
| Synthetic Marijuana | .046 | .102 | .155 |
| Steroids | .073 | .128 | -.086 |
| Unprescribed | -.134 | -.046 | .339** |
| Prescription | | | |
| Injection Drugs | -.135 | .000 | .123 |

Note: * = $p < .05$; ** = $p < .01$

Table 4 Hierarchical linear regression results of IVs and delinquency

| Model | Predictor | Unstandardized | | Standardized | | R^2 | R^2 Change | F | p |
|-------|--------------|----------------|------|--------------|-------------|-------|--------------|--------|-------|
| | | Coefficients | B | $S.E. B$ | Coefficient | | | | |
| 1 | Self-Control | -.182 | .044 | -.379 | .144 | | | 17.288 | <.001 |
| 2 | Self-Control | -.169 | .045 | -.351 | .159 | .015 | | 9.621 | <.001 |
| | Religiosity | -.118 | .088 | -.126 | | | | | |

Table 5 Ordinal regression results of IVs and substance use

| Substance Outcome | Model | Predictor | B | $S.E. B$ | OR | $Wald$ test | p |
|-------------------|-------|--------------|-------|----------|-------|-------------|------|
| Alcohol | 1 | Self-control | -.038 | .013 | .962 | 8.168 | .004 |
| | 2 | Self-control | -.042 | .014 | .958 | 8.803 | .009 |
| | | Religiosity | .024 | .026 | 1.024 | .893 | |

Table 5 Continued

| | | | | | | | |
|-----------------|---|--------------|-------|------|------|-------|------|
| Marijuana | 1 | Self-control | -.013 | .014 | .99 | .863 | .351 |
| | 2 | Self-control | -.012 | .014 | .99 | .740 | .636 |
| | | Religiosity | -.005 | .028 | .99 | .034 | |
| Cocaine | 1 | Self-control | -.034 | .016 | .97 | 4.297 | .034 |
| | 2 | Self-control | -.035 | .017 | .97 | 4.454 | .098 |
| | | Religiosity | .013 | .031 | 1.01 | .168 | |
| Inhalants | 1 | Self-control | -.012 | .015 | .99 | .600 | .442 |
| | 2 | Self-control | -.011 | .015 | .99 | .559 | .744 |
| | | Religiosity | -.001 | .030 | .99 | .001 | |
| Heroin | 1 | Self-control | -.005 | .018 | .99 | .065 | .797 |
| | 2 | Self-control | -.003 | .019 | .99 | .023 | .886 |
| | | Religiosity | -.015 | .036 | .99 | .178 | |
| Methamphetamine | 1 | Self-control | -.021 | .017 | .98 | 1.492 | .208 |
| | 2 | Self-control | -.022 | .018 | .98 | 1.605 | .426 |
| | | Religiosity | .012 | .034 | 1.01 | .128 | |
| Ecstasy | 1 | Self-control | -.011 | .015 | .99 | .513 | .479 |
| | 2 | Self-control | -.010 | .015 | .99 | .462 | .775 |
| | | Religiosity | -.003 | .029 | .99 | .009 | |
| Hallucinogens | 1 | Self-control | -.016 | .014 | .99 | 1.329 | .242 |
| | 2 | Self-control | -.013 | .015 | .99 | .827 | .313 |
| | | Religiosity | -.028 | .028 | .98 | 1.031 | |
| Synthetic MJ | 1 | Self-control | .004 | .014 | 1.00 | .090 | .767 |
| | 2 | Self-control | .001 | .014 | 1.00 | .006 | .601 |
| | | Religiosity | .028 | .028 | 1.02 | .955 | |
| Steroids | 1 | Self-control | .001 | .018 | 1.00 | .001 | .974 |
| | 2 | Self-control | -.003 | .018 | .99 | .023 | .693 |
| | | Religiosity | .031 | .037 | 1.03 | .715 | |
| Unprescribed Rx | 1 | Self-control | -.017 | .013 | .99 | 1.734 | .184 |
| | 2 | Self-control | -.016 | .013 | .98 | 1.587 | .411 |
| | | Religiosity | -.003 | .025 | .99 | .016 | |
| Injection Drugs | 1 | Self-control | -.015 | .020 | .99 | .544 | .458 |
| | 2 | Self-control | -.017 | .020 | .98 | .716 | .644 |
| | | Religiosity | .023 | .041 | 1.02 | .319 | |

Table 6 *Correlation results of personality data and all variables*

| Pearson Correlation | | | | | |
|----------------------------|----------|-------------------|--------------|---------------|-------------|
| Table 6 Continued | | | | | |
| | Openness | Conscientiousness | Extraversion | Agreeableness | Neuroticism |
| Self-Control | .211* | .259** | .042 | .323** | -.244** |
| Religiosity | .054 | .225* | .094 | .247** | -.031 |
| Delinquency | -.014 | .074 | -.015 | -.047 | -.113 |
| Alcohol | -.002 | .116 | .106 | -.153 | -.158 |
| Marijuana | .002 | .058 | -.050 | .043 | -.182 |
| Cocaine | -.038 | -.038 | -.007 | .039 | .098 |
| Inhalants | .145 | .177 | .022 | .066 | -.007 |
| Heroin | .047 | .000 | .113 | -.030 | -.036 |
| Methamphetamine | .071 | .094 | -.016 | -.030 | -.113 |
| Ecstasy | .056 | .071 | .076 | .015 | .048 |
| Hallucinogen | .212* | .103 | .087 | .124 | -.052 |
| Synthetic Marijuana | -.118 | -.126 | -.060 | -.004 | -.040 |
| Steroids | .053 | .003 | .079 | -.045 | .010 |

Table 6 Continued

| | | | | | |
|--------------|------|------|-------|-------|-------|
| Unprescribed | .140 | .015 | -.011 | -.013 | -.048 |
| Prescription | | | | | |
| Injection | .077 | .039 | .013 | -.025 | .041 |
| Drugs | | | | | |

Note: * = $p < .05$; ** = $p < .01$

Table 7 Hierarchical linear regression results of IVs and delinquency, with personality covariates

| Model | Predictor | Unstandardized | | Standardized | R^2 Change | F | p |
|-------|--------------|----------------|-------------|--------------|--------------|-------|-------|
| | | Coefficients | Coefficient | | | | |
| | | B | S.E. B | β | | | |
| 1 | Self-Control | -.182 | .044 | -.379 | | 17.28 | <.001 |
| | | | | | | 8 | |
| 2 | Self-Control | -.169 | .045 | -.351 | .015 | 9.621 | <.001 |

Table 7 Continued

| | | | | | | | |
|---|-------------------|-------|------|-------|------|-------|-------|
| | Religiosity | -.118 | .088 | -.126 | | | |
| 3 | Self-Control | -.230 | .046 | -.479 | .113 | 5.160 | <.001 |
| | Religiosity | -.144 | .086 | -.153 | | | |
| | Openness | -.008 | .426 | -.002 | | | |
| | Conscientiousness | .662 | .407 | .164 | | | |
| | Extraversion | -.278 | .380 | -.064 | | | |
| | Agreeableness | .488 | .415 | .116 | | | |
| | Neuroticism | -.942 | .358 | -.237 | | | |

Table 8 Ordinal regression results of IVs and substance use, with personality covariates

| Substance Outcome | Model | Predictor | B | S.E. B | OR | Wald test | P |
|-------------------|-------|-------------------|-------|--------|------|-----------|------|
| Alcohol | 3 | Self-control | -.048 | .016 | .95 | 9.436 | .029 |
| | | Religiosity | .031 | .027 | 1.03 | 1.326 | |
| | | Openness | -.007 | .132 | .99 | .002 | |
| | | Conscientiousness | .114 | .127 | 1.12 | .806 | |
| | | Extraversion | .014 | .120 | 1.01 | .014 | |
| | | Agreeableness | -.131 | .131 | .88 | .995 | |
| | | Neuroticism | -.228 | .117 | .80 | 3.814 | |
| Cocaine | 3 | Self-control | -.038 | .018 | .96 | 4.380 | .329 |
| | | Religiosity | .000 | .033 | 1 | .000 | |
| | | Openness | -.007 | .162 | .99 | .002 | |
| | | Conscientiousness | .041 | .153 | 1.04 | .073 | |

Table 8 Continued

| | | | | |
|---------------|------|------|------|------|
| Extraversion | .016 | .146 | 1.02 | .011 |
| Agreeableness | .202 | .164 | 1.22 | 1.53 |
| Neuroticism | .160 | .135 | 1.17 | 1.49 |

Note: See Table 5 for model 1 & 2 results

APPENDIX B – IRB Approval Letter

**Office of
Research Integrity**



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NOTICE OF RENEWAL

The University of Southern Mississippi's Office of Research Integrity has received the notice of renewal for your submission:

PROTOCOL NUMBER: IRB R-CH11-24111802

PROJECT TITLE: Predictors of Behavioral Outcomes in a Group of At-Risk Adolescents

SCHOOL/PROGRAM: School of Psychology, Psychology

RESEARCHER(S): Nora Charles, Tiffany Harrop, Paula Floyd, Lydia Sigurdson, Margaret Bullerjahn, Lauren Burns,

IRB COMMITTEE ACTION: Approved

In accordance with Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy your prior reviewed submission has been renewed. From this time of this renewal your study is approved for twelve months.

PERIOD OF APPROVAL: August 9, 2019 - August 8, 2020

**Sincerely,
Office of Research Integrity**

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