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DEVELOPING A COMPREHENSIVE MODEL OF
PERSONALITY, BELIEFS, AND RELIGIOSITY TO EXPLAIN
UNDERAGE DRINKING IN COLLEGE STUDENTS

DISSERTATION

A dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor of
Philosophy in the College of Arts and Sciences
at the University of Kentucky

By
Hayley A. Cole

Lexington, KY

Director: Dr. Charles R. Carlson, Professor of Psychology

Lexington, KY

2018

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ABSTRACT OF DISSERTATION

DEVELOPING A COMPREHENSIVE MODEL OF PERSONALITY, BELIEFS, AND RELIGIOSITY TO EXPLAIN UNDERAGE DRINKING IN COLLEGE STUDENTS

Researchers have demonstrated that college students with strong religious beliefs unsupported by religious behaviors report greater involvement in underage drinking, drug use, and risky sex than students with concordant high or concordant low religious beliefs and behaviors. Recent research also suggests personality traits, belief systems, and environments may be influencing this group's risky behaviors; however, further research is needed to identify factors contributing to these students' life choices (including the decision to not support their religious beliefs with specific religious behaviors). This study reports on tests of a psychosocial mediational model, connecting personality traits, religious beliefs, religious behaviors, and underage drinking. Using Structural Equation Modeling and a sample of 411 underage college students, we tested whether the association between five impulsive personality traits and underage drinking was mediated by the discordance of religious beliefs and behaviors. We also tested whether the same predictive effects could be observed using three broader personality trait domains. Although students with discordant religious beliefs and behaviors drank more than their concordant religious peers, we did not find support for the proposed mediational models. Exploratory follow-up analyses offered support for an alternative direction; underage drinking mediated the relationship between eight out of nine personality variables and the discordance of religious beliefs and behaviors. Findings indicated students with strong religious beliefs unsupported by religious behaviors reported higher levels of impulsive traits and perceived invincibility and lower levels of Conscientiousness and Agreeableness than their peers high in both religious beliefs and behaviors; this effect operated indirectly through underage drinking. Implications for directional risk models and points of intervention are discussed.

KEYWORDS: drinking, religiosity, impulsogenic, personality, risk

Hayley A. Cole

January 15, 2018

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CHAPTER ONE: INTRODUCTION

Background

College drinking has been linked to an increased risk for negative consequences including academic failure, legal repercussions, changes in brain function, and unintentional injury or death (Hingson, Zha, & Weitzman 2009, White & Hingson, 2013). Since 80% of U.S. college students, many of whom are underage, consume alcohol at least occasionally, the risk for alcohol-related negative consequences is especially high in this population (Johnston, O'Malley, Bachman, Schulenberg, & Miech, 2014; Douglas et al., 1997). Although a number of factors have been posited to explain adolescents' engagement in underage drinking, one of the most promising protective factors against alcohol consumption is religiosity (a belief in divine existence with an emphasis on group affiliation and prescribed actions) (Burriss, Sauer, & Carlson, 2011; Chen, Dufour, & Yi, 2004; Ham & Hope, 2003). High levels of religiosity predict young college students' abstention from underage drinking (Brechtling & Carlson, 2015; Brown, Salsman, Brechtling, & Carlson, 2007; Douglas et al., 1997). In a review of 278 studies examining the relationship between religiosity and alcohol use, Koenig and colleagues (2012) found that 86% of studies demonstrated a negative association between these variables. Religiosity's protective properties for alcohol use have been particularly robust and demonstrated across age, gender, and socioeconomic status (Wills, Yaeger, & Sandy, 2003).

Despite the majority of studies attesting to the protective properties of religiosity, Brechtling and colleagues (2010) found evidence to suggest that not all facets of religiosity are associated with reduced alcohol consumption. Their results indicated that

college students must demonstrate frequent religious behaviors (personal religious actions like prayer, as well as external and social behaviors like religious service attendance) in addition to strong religious beliefs (faith in and commitment to God) in order to benefit from religiosity's protective effects against underage drinking. This research also identified a potential target for intervention; college students who maintained strong religious beliefs but who did not support their beliefs with religious behaviors reported among the highest rates of alcohol consumption, comparable to those of non-religious students. Cole and colleagues (under review) replicated these findings and found that these students with strong religious beliefs but discordant religious behaviors reported heavier underage drinking than all other groups of peers, including non-religious students. Their findings also replicated with three-month frequency of drug use and lifetime number of drugs tried. A final study (Prassel, Cole, & Carlson, in preparation) extended these findings to risky sexual practices and found that students with high religious beliefs unsupported by religious behaviors reported a higher frequency of recent risky sexual practices (e.g., number of sex acts without a condom and number of sexual partners in the past three months) in addition to a greater number of lifetime sexual partners than their peers with concordantly low or concordantly high religious beliefs and behaviors. Together these findings suggest that college students who possess strong religious beliefs unsupported by religious practices may be at an increased risk of making life choices that carry the potential for significant harm and thus, may be a potential target for intervention.

Although evidence continues to mount that students with discordant religious beliefs and behaviors are disproportionately engaging in risky behaviors, the underlying

mechanism for this relationship remains unclear. To begin, researchers have been unable to draw conclusions about the direction of these effects as all available research to date has been cross-sectional in nature (Brechting et al., 2010, Cole et al., under review, Prassel et al., in preparation). Past investigators have unanimously theorized that discrepancies between religious beliefs and behaviors precede and contribute to heightened alcohol consumption. More specifically, researchers have hypothesized that students who hold strong religious beliefs and frequently engage in supportive religious behaviors (e.g., church attendance) are more likely to surround themselves with like-minded religious peers (Kandel, 1985). As a result, these students may benefit from both peer modeling of healthy lifestyle choices and limited exposure to risky behaviors (e.g., underage drinking), making them less likely to engage in high-risk activities. On the other hand, students with strong religious beliefs unsupported by religious behaviors likely lack the protective effects of religious social circles that develop with frequent religious service attendance. As religious beliefs are often passed down within families (Flor & Knapp, 2001, Hayes & Pittlekow, 1993), these students may also face the challenge of growing up in religious households that provided abstinent-only education, thus, putting them at a disadvantage for knowing how to engage in risky activities in moderation (Cole et al., under review). Limited longitudinal work focused exclusively on religious behaviors, offers support for this directional hypothesis (Brown et al., 2007, Wills et al., 2003). However, Cole and colleagues (under review) also acknowledged that cross-sectional data make it difficult to assess the validity of the alternative interpretation- that students' early experiences with substance use may impact the development of their religiosity. For example, drinking behaviors typical of college

students (e.g., late night drinking on Saturday nights) may prove to be incompatible with religious behaviors (e.g., attending Sunday morning religious services) and thus, early drinking experiences for once highly religious individuals could lead to a discordance of beliefs and behaviors. Further work is needed to offer support for the directionality of this relationship.

In addition to limited studies addressing the direction of the religious beliefs, religious behaviors, and underage drinking association, there is also a lack of studies that address whether additional variables may contribute to this relationship. To date, Cole and colleagues (under review) are the only researchers to report on factors that may mediate this relationship. Their findings indicated that the association between religious beliefs and behaviors and underage drinking are likely mediated by the affect students experience while drinking, descriptive drinking norms, and social availability of alcohol. This suggests the importance of a psychosocial model that posits students' personality traits, belief systems, and environment all contribute to the increased risk of underage drinking for students with higher religious beliefs but lower religious behaviors.

A final limitation of the available research is its inability to answer, 'What leads to discordant religious beliefs and behaviors in the first place?' If students with high religious beliefs but low religious behaviors are at an increased risk for harm, the ability to identify factors that leads to this discordancy seems important, particularly for the purpose of intervention. We are not aware of any research to date that has been able to predict religious belief and behavior discordancy. Past researchers have speculated that students with strong religious beliefs unsupported by religious behaviors may represent a rebellious personality group (Brechtling et al., 2010, Cole et al., under review). They

hypothesized that these students may be rebelling against family messages of what is “right” and “wrong,” first by stopping religious practices and next by trying previously condemned activities such as underage drinking and risky sex. Cole and colleagues’ (under review) findings that these students experience greater positive affect while drinking offers further support that personality may play an important role in the relationship between religiosity and underage drinking but stops short of predicting risky group membership. The current study sought to investigate whether select personality traits could be used to predict a disconnect between college students’ religious beliefs and behaviors, and in turn, underage drinking behaviors.

Personality

A large body of research attests to the importance of impulsive personality traits in predicting risky behaviors such as underage drinking (Berg, Latzman, Bliwise, & Lilienfeld, 2015; Cyders, Flory, Rainer, & Smith, 2009; Settles, Cyders, & Smith, 2010), drug use (Zapolski, Cyders, & Smith, 2009), and high-risk sexual practices (Zapolski et al., 2009). Researchers have identified four personality variables that reflect a tendency to behave impulsively: 1) lack of planning, 2) lack of perseverance, 3) sensation seeking, and 4) urgency (the tendency to act rashly when experiencing strong positive or negative emotions) (Lynam, Smith, Whiteside, & Cyders, 2006). Investigators have demonstrated reciprocal prediction between early drinking and impulsivity, suggesting that impulsogenic personality traits found in childhood lead to increases in drinking, which in turn lead to further increases in impulsivity and heightened risk for future participation in risky behaviors (Riley, Rukavina, & Smith, 2016).

Although impulsive personality traits have never been explored in relation to religiosity, it is possible that the strong relationship between students with higher religious beliefs/lower behavior and risky behaviors may actually reflect these impulsive personality traits. Impulsive tendencies reflective of low Conscientiousness (lack of planning and perseverance) may lead young college students to cease behaviors (e.g., regular religious service attendance) that once helped to protect them from risk. Additionally, these same traits may make it difficult for students with strong religious beliefs to resist the temptation of drinking when faced with peer pressure. Therefore, we hypothesized that lack of planning and perseverance would predict a discordancy between students' religious beliefs and behaviors and subsequently, heightened alcohol consumption. Additionally, findings that students with religious beliefs and discordant behaviors experience greater positive affect and feelings of aggression while drinking (Cole et al., under review) suggest that strong emotions may also be important drivers of their decision to drink heavily. Accordingly, we hypothesized that sensation seeking, positive urgency (the tendency to act rashly when experiencing positive emotions), and negative urgency (the tendency to act rashly when experiencing negative emotions) would predict discordant religious beliefs and behaviors and heightened alcohol consumption.

Lack of planning and lack of perseverance are understood to reflect low levels of Conscientiousness, and sensation seeking is understood to be a facet of the trait domain of Extraversion (Whiteside & Lynam, 2001). Urgency has been shown to reflect a combination of high neuroticism, low conscientiousness, and low agreeableness (Cyders & Smith, 2008). Thus, each of these impulsogenic traits can be understood within the

framework of comprehensive models of personality, such as the Five Factor Model (Costa & McCrae, 1992). Just as each of these specific traits predicts addictive behavior, it may be that the broad trait domains from which they come do as well. It therefore seemed valuable to investigate whether Neuroticism positively, and Conscientiousness and Agreeableness negatively, predicted the religious belief/behavior disconnect and heavy drinking behavior.

In addition to the eight well-established personality constructs, we elected to include one exploratory variable- perceptions of invincibility. Limited research shows that adolescents' beliefs about invincibility are related to risk taking; high school students who believe that bad things won't happen to them report higher involvement in high-risk activities (Monneuse et al., 2008, Wickman, Anderson, & Greenberg, 2009). We were interested in exploring if these results extended to college students' underage drinking. It is plausible that this variable may also relate to students' religious belief and behavior discordance. Students who believe that nothing bad will happen to them may extend this belief to religiosity, adopting the perspective that their immortality is safe even if they grow lax in religious behaviors. As it is also possible that students with both strong religious beliefs and behaviors may feel protected by a higher power and thus, highly invincible, we decided to not make specific predictions regarding the relationship between these variables and instead, treat these analyses as exploratory.

Current Study

Although college students with strong religious beliefs unsupported by religious behaviors are an under-recognized risk group, mounting evidence suggests these students may be engaging in dangerous underage drinking, heavy drug use, and risky sexual

practices at higher rates than their peers. Thus, there is a need to better understand this group and in particular, identify factors that may contribute to their life choices (including the decision to not support their religious beliefs with specific religious behaviors). Past research has identified the importance of environmental factors, personality factors, and beliefs about drinking in explaining risky behavioral choices and we decided to further investigate the role of select personality traits in predicting discordancy between religious beliefs and behaviors. Our aim was to expand upon past research to develop a more comprehensive model of risk.

The risk model under investigation in this study (see Figure 1.1) was, ultimately, a causal model of risk: the model hypothesized that select personality traits influence a belief/behavior disconnect in students that heightens risk of underage drinking. It is important to note that the current study was cross-sectional and correlational in design, and so does not constitute a test of causality; however, a directional approach was needed to guide the developmental model. Thus, we developed our model from past available research suggesting that differences in religiosity contribute to differences in drinking. Given this framework we were particularly interested in identifying variables that could help predict the development of discordant religious beliefs and behaviors in college students to aid in the prediction of underage drinking. Although we used this directional framework to guide study development, we remained open to the possibility of alternate directional effects. Given the limited research base, the intent of this study was to determine whether the hypothesized relationships were present cross-sectionally, in order to determine the value of proceeding with a more expensive, longitudinal test of this model.

Our first study goal was to determine if impulsogenic personality traits predicted the development of discordant religious beliefs and behaviors and ultimately, risky underage drinking. Within this goal we tested the following hypotheses: (1) impulsive personality traits (lack of planning, lack of perseverance, sensation seeking, positive urgency, and negative urgency) would predict a disconnect between students' religious beliefs and behaviors; (2) the disconnect would, in turn, predict heavier alcohol consumption; and (3) statistical tests of mediation would be consistent with the possibility that the disconnect mediates the predictive influence of impulsive personality traits on heavy drinking behavior.

Our second study goal was to determine whether the same predictive effects could be observed using broad personality trait domains, rather than specific impulsogenic traits. Specifically, we hypothesized that (4) Neuroticism would be positively related to students' possession of strong religious beliefs unsupported by religious behaviors while Conscientiousness and Agreeableness would be negatively related to the belief/behavior discordancy; and (5) the discordance would mediate the predictive influence of the broad traits on drinking behavior. The hope was to determine whether the predictive relationships of interest in this study are the same whether one begins with broad personality trait domains or specific, impulsogenic traits.

The third goal of the study was to explore if similar predictive effects could be observed using a relatively unexplored variable- perceptions of invincibility. We hypothesized that (6) differences in perceptions of invincibility would predict differences in religious beliefs/behaviors concordance; and (7) religious beliefs/behaviors discordance would mediate the predictive influence of perceived invincibility on drinking

behavior. We refrained from making directional hypotheses for this variable and instead, chose to examine this relationship in an exploratory way.

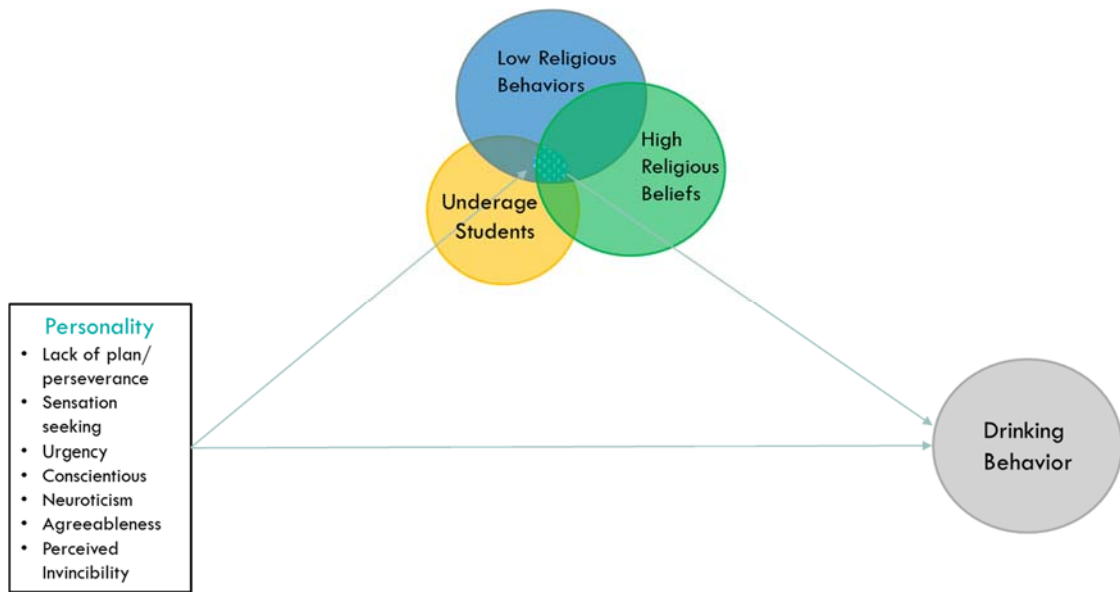


Figure 1.1 Original hypothesized cross-sectional mediational model. This figure illustrates the model driving initial study hypotheses; the model formulates that religious discordance (i.e. high religious beliefs unsupported by religious behaviors) would mediate the association between select personality traits and underage drinking behavior.

CHAPTER TWO: METHODS

Sampling Procedures

Students enrolled in non-major specific entry-level psychology courses at a large, public university located in the southern United States were invited to complete an online survey. Participation was voluntary and students could elect to participate in research or complete alternative assignments to obtain course credit. Study participation was limited to adults under the legal drinking age (i.e., 18-20 years old). Past research has shown that although underage college students drink less frequently than their “of age” peers, underage drinkers tend to consume substances in a riskier manner (Wechsler, Lee, Nelson, & Kuo, 2002), thus, this restriction was important to allow our results to be compared with past studies in the field (Cole et al., under review, Brechting et al., 2010; Bodford & Hussong, 2013). Participants indicated their consent to research participation before accessing the online survey. Participants’ names were separated from data to allow for anonymity. Following completion of the survey, participants were given a debriefing statement. The study’s protocol was approved by the University’s Institutional Review Board and participant treatment met all ethical standards proposed by the American Psychological Association.

Participants

Four hundred eleven students participated in the study (71% female). Freshman composed 57% of the sample. The sample was 74% White, 15% African American, 4% Hispanic/Latino, 2% Asian, and 5% other or unknown. Compared to undergraduate demographics reported by the university, our sample reflected an over-representation of female (university: 54%) and African American (university: 8%) students but was

representative of the percentage of White (university: 74%), Hispanic/Latino (university: 4%), and Asian (university: 3%) students. The most commonly reported religious affiliations in our sample were Catholicism (27%), Protestant (20%), ‘Other Christian’ (31%), and Agnostic/Spiritual (6%). Eleven percent of the sample identified as non-religious or Atheist. The mean age of the sample was 18.72 years ($SD=.74$). Eighty six percent of the sample reported at least one experience of consuming a full drink of alcohol underage. Ninety nine percent of participants who began the survey completed it; five participants withdrew early from the study for unknown reasons.

Measures

Demographics

Participants reported their age, sex, ethnic background, current year in school, religious affiliation, and involvement in extracurricular activities in the last year.

Religious Beliefs

Religious beliefs were measured with the 7-item long form of the religious beliefs scale proposed by the National Institute on Aging and the Fetzer Institute (Fetzer Institute/NIA, 1999). The measure emphasizes the strength of one’s beliefs in a deeper purpose of life and the comfort provided by one’s belief system. A sample item for the scale is, “When faced with a tragic event I try to remember that God still loves me and that there is hope for the future.” Responses for most items range from 1 (Disagree Strongly) to 5 (Agree Strongly). Reliability was excellent ($\alpha = 0.91$).

Religious Behaviors

Public and private religious behaviors were measured using six items identified by a national working group commissioned by the National Institute on Aging and the

Fetzer Institute (Fetzer Institute/NIA, 1999). These items assess the frequency of public and private religious behaviors such as service attendance, prayer, and the reading of religious texts. A sample item is, “How often do you attend religious service?” with responses ranging from 1 (Never) to 9 (Several times a week). The number of possible Likert-type responses varied for each question so items were transformed in order to give each question equal weight for the composite scale. Composite scale reliability was good ($\alpha = 0.87$).

Drinking Behavior

Alcohol use was assessed using the Alcohol Use Disorders Test (AUDIT, Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The AUDIT has 10 items consisting of two subscales (quantity and frequency of alcohol consumption and alcohol-related problems/dependence). Research suggests it is advantageous to assess these two subscales separately and to exclude item 9 (“Have you or someone else been injured as a result of your drinking?”) when working with college populations (Northrup, Malone, Follingstad, & Stotts, 2013). Our results also confirmed a decrease in reliability with the inclusion of item 9. Internal consistency was good for the quantity and frequency subscale ($\alpha = 0.83$) but questionable for the problems and dependence subscale ($\alpha = 0.69$), thus, only the quantity and frequency subscale was used for analyses. Therefore, underage drinking was assessed using three questions: (1) “How often do you have a drink containing alcohol?”, (2) “How many drinks containing alcohol do you have on a typical day when you are drinking?”, and (3) “How often do you have six or more drinks on one occasion?”

Impulsigenic Personality Traits

Participants' predisposition for impulsive behaviors was assessed using the UPPS-P (Lynam et al., 2006). The scale uses 59 Likert-Type items to assess lack of premeditation, lack of perseverance, sensation seeking, negative urgency (the tendency to act rashly when in a negative mood), and positive urgency (the tendency to act rashly when in a positive mood). All scales were measured using a four-point Likert scale that ranged from 1 (not at all like me) to 4 (very much like me). All estimates of internal consistency ranged from good to excellent: .86 (lack of planning), .81 (lack of perseverance), .85 (sensation seeking), .88 (negative urgency), and .94 (positive urgency).

Broad Personality Trait Domains

The IPIP-NEO-120 (Johnson, 2014) Conscientiousness, Neuroticism, and Agreeableness scales were used to assess broad personality dispositions. The IPIP-NEO-120 uses 120 self-report items to assess the five personality factors identified in the NEO-PI-R (Costa & McCrae, 1992). Each factor scale of the IPIP-NEO-120 consists of 24 Likert-type questions with responses that range from 1 (very inaccurate) to 5 (very accurate). The Neuroticism scale is made up of six subscales (anxiety, anger, depression, self-consciousness, immoderation, and vulnerability). A sample item is, "I get stressed out easily." The Conscientiousness scale is comprised of six subscales (self-efficacy, orderliness, dutifulness, achievement-striving, self-discipline, and cautiousness). A sample item is, "I am always prepared." The Agreeableness scale is comprised of six subscales (trust, morality, altruism, cooperation, modesty, and sympathy). A sample item

is “I believe that others have good intentions.” Reliability for the three factors ranged from $\alpha = .88-.90$.

Perceptions of Invincibility

The Adolescent Invincibility Tool (AIT, Wickman & Koniak-Griffin, 2013) was used to assess participants’ perception that they are not at risk for harm. The AIT has five subscales that assess participants’ perceptions that they are able to “get away” with reckless behaviors and that bad things will not happen to them as well as participants’ desires to take risks, to experience things themselves, and to feel as though they are their own person. A sample item is, “I do not get hurt when I do risky things.” Internal reliability for an overall composite AIT score was good ($\alpha = 0.86$).

Data Analysis

Data were first analyzed to determine if there was any evidence for systematic missingness using Little’s MCAR test (Little, 1988). No such evidence was found ($\chi^2(50, N=411) = 51.617, p = 0.410$) so we inferred that data were missing completely at random. Missing data were then imputed using the well-supported expectation maximization (EM) procedure (Enders, 2006). Monte Carlo analyses have shown that EM procedures are a less biased and more accurate strategy for dealing with missing data than list-wise deletion (Gold & Bentler, 2000, Roth, 1994, Roth, Switzer, & Switzer, 1999).

As we were most interested in students with strong religious beliefs unsupported by religious behaviors, we first classified students by their combination of religious beliefs and behaviors: Class 1 = students with higher religious beliefs and higher religious behaviors, Class 2 = students with lower religious beliefs and lower religious

behaviors, Class 3 = student with higher religious beliefs and lower religious behaviors (target group of interest), and Class 4 = student with lower religious beliefs but higher religious behaviors. Next, we conducted a series of pairwise comparisons (test 1: Class 1 vs. Class 3; test 2: Class 2 vs. Class 3) to determine if risky alcohol consumption could be predicted by strong religious beliefs with discordant religious behaviors and if that effect could be attributed to select personality traits.

In order to test our comprehensive mediational model connecting personality traits, religious beliefs, religious behaviors, and underage drinking, we used structural equation modeling (SEM) with the help of M*plus (Muthén &, Muthén, 2004-2010). Given our specific directional hypotheses for most variables, we used one-tailed tests for all originally proposed impulsogenic and broad personality mediational analyses. Two-tailed tests were used for exploratory mediational analyses involving perceptions of invincibility. Bias-corrected bootstrapping analyses (as proposed by Shrout & Bolger, 2002) were used to test the significance of the indirect effect and to determine if religious discordancy mediated the relationship between personality traits and underage drinking. Specifically, we first tested whether the associations between impulsive personality traits (lack of planning, lack of perseverance, sensation seeking, positive urgency, and negative urgency) and underage drinking were mediated by discordancy of religious beliefs and behaviors and whether the association between perception of invincibility and underage drinking was mediated by discordancy of religious beliefs and behaviors.

This first set of eleven analyses did not yield any evidence to support our initially proposed theory and thus, we discontinued testing of our remaining proposed models (i.e. testing whether the associations between broad personality trait domains (Neuroticism,

Conscientiousness, and Agreeableness) and underage drinking were mediated by discordancy of religious beliefs and behaviors). Following this event, we re-evaluated our initial model and developed an alternate model (more information provided in Results). Under the guidance of the new model, we tested (1) whether the associations between impulsive personality traits (lack of planning, lack of perseverance, sensation seeking, positive urgency, and negative urgency) and discordancy of religious beliefs and behaviors were mediated by underage drinking, (2) whether the associations between broad personality trait domains (Neuroticism, Conscientiousness, and Agreeableness) and the discordancy of religious beliefs and behaviors were mediated by underage drinking, and (3) whether the association between perception of invincibility and the discordancy of religious beliefs and behaviors was mediated by underage drinking. We used the same analytic strategies to test for mediational effects using the new model.

CHAPTER THREE: RESULTS

The means and standard deviations of the primary variables of interest can be found in Table 3.1. All variables of interest appeared to be approximately normally distributed thus, we dichotomized our religious beliefs and religious behaviors variables using a mean split to create distinct religious groups. Using this procedure, 164 students were classified as Class 1 (high in both religious beliefs and behaviors), 150 students were classified as Class 2 (low in both religious beliefs and behaviors), and 87 students were classified as Class 3 (high in religious beliefs but low in religious behaviors). Ten students were classified as Class 4 (low in religious beliefs but high in religious behaviors); due to small sample size and lack of a priori hypotheses, this group was dropped from further analyses. Class 1 reported the lowest levels of alcohol consumption ($M=2.72$, $SD=2.56$) and consumed significantly less alcohol than Class 2 ($M=3.34$, $SD=2.63$) ($t(312) = -2.07$, $p<.05$) or Class 3 ($M=3.68$, $SD=2.96$) ($t(249) = -2.63$, $p<.01$). Class 3 reported the highest rates of alcohol consumption but did not differ significantly from Class 2: $t(235) = 0.91$, $p>.05$.

Proposed Model Tests

The first model we tested specified that religious classification group would mediate the relationship between each of five impulsogenic traits (lack of planning, lack of perseverance, sensation seeking, positive urgency, and negative urgency) and alcohol consumption. Specifically, we predicted that Class 3 would report higher levels of each impulsogenic trait than Class 1 and Class 2. In turn, Class 3 would also report heavier alcohol consumption than Class 1 and 2. We first compared students with high religious beliefs and behaviors (Class 1) with students who had high religious beliefs but low

religious behaviors (Class 3). Indirect effects of mediation were non-significant for all five impulsigenic models ($p > .05$) (see Table 3.2 and Figure 3.1). More specifically, lack of planning (standardized $b = -0.06$, $p > .05$), lack of perseverance ($b = .02$, $p > .05$), and negative urgency ($b = .05$, $p > .05$) did not predict differences in religious classification group. Positive urgency ($b = .13$, $p < .05$) and sensation seeking ($b = .11$, $p < .05$) positively predicted Class 3 membership. Religious classification predicted alcohol consumption for all models with Class 3 reporting more alcohol consumption than Class 1 ($p < .05$). All five impulsigenic traits positively predicted alcohol consumption ($p < .001$) but again, all tests of indirect effect were non-significant.

Mediational analyses involving impulsigenic traits were repeated to compare students with low religious beliefs and behaviors (Class 2) with students who had high religious beliefs unsupported by religious behaviors (Class 3). Again, indirect effects of mediation were non-significant ($p > .05$) for all five impulsigenic models (See Table 3.2 and Figure 3.2). In all five analyses students' impulsigenic traits predicted alcohol consumption ($p < .001$) but did not predict religious classification group membership ($p > .05$). In turn, religious classification did not predict alcohol consumption ($p > .05$) and indirect effects were non-significant. In summary, we found no evidence to support the idea that impulsive personality traits could be used to predict discordance of religious beliefs and behaviors and in turn, differences in alcohol consumption.

Ten out of ten analyses conducted did not find any evidence to support our proposed model that religious beliefs/behaviors discordance mediates the relationship between impulsive personality traits and alcohol consumption. As past research has shown that select impulsigenic traits are stronger predictors of drinking behavior than

broad personality trait domains (Woicik, Stewart, Pihl, & Conrod, 2009, Settles et al., 2012), it seemed unlikely that indirect effects for these broad personality trait domains would prove to be significant. We were cautiously aware that the risk of Type I error grows with every additional test conducted. Thus, we wanted to weigh carefully the utility of proceeding with subsequent tests. We decided to run one of our proposed exploratory tests to gather further information to aid in this decision making. We tested a mediational model comparing Class 1 and Class 3 students that posited differences in perceptions of invincibility would predict different religious class membership and ultimately, different alcohol consumption. Although perceptions of invincibility predicted alcohol consumption ($b=.28, p<.001$), invincibility did not predict religious class ($b=.02, p>.05$), and the overall indirect effect was non-significant ($b=.00, p>.05$). Thus, there was again no evidence to support the idea that our chosen personality traits could predict religious group membership and in turn differences in drinking behavior. As all proposed analyses were based on this model, we elected to not proceed with remaining mediation analyses.

Follow-Up Model Tests

Although there was no evidence to support the proposed mediational model, we were still interested in relationships between these variables. Particularly, we were curious about the idea first proposed by Cole and colleagues (under review) that drinking behaviors may directly interfere with students' religious behaviors and thus, influence the concordance of their religious beliefs and behaviors. Accordingly, we decided to conduct select analyses to explore if alcohol consumption mediated the relationship between personality traits and religiosity (see Figure 3.3). To begin, we predicted that

impulsigenic personality traits would positively predict alcohol consumption. Alcohol consumption would then in turn predict religious classification, with students with heavier alcohol consumption being more likely to belong to Class 3 than Class 1. Indirect effects were significant in the predicted direction for all five impulsigenic models (see Table 3.3 and Figure 3.4). Thus, statistical tests were consistent with the possibility that alcohol consumption mediates the relationship between impulsigenic personality traits and religious classification when comparing Class 1 and Class 3 students.

Identical analyses were conducted comparing Class 2 and Class 3 students. Indirect effects of mediation were non-significant ($p > .05$) for all five impulsigenic models, likely due to the similar rates of alcohol consumption for the two groups. As zero of ten analyses had shown evidence of significant mediational pathways that could be used to differentiate Class 2 and Class 3 students, we elected to not run any additional analyses comparing these groups. We focused all remaining exploratory analyses on comparing students in Class 1 and Class 3.

As specific impulsigenic personality traits appeared to be important in differentiating students in Class 1 and 3, we tested whether broad personality domains (Neuroticism, Conscientiousness, and Agreeableness) offered the same predictive power for these groups (see Table 3.3 and Figure 3.5). Analyses showed that alcohol consumption did not mediate the relationship between Neuroticism and religious classification: standardized $b = -0.00$, $p > .05$. However, Conscientiousness ($b = -0.24$, $p < .05$) and Agreeableness ($b = -0.03$, $p < .05$) both predicted religious classification indirectly through alcohol consumption. In other words, students low in Conscientiousness and

Agreeableness consumed more alcohol than students high in these traits and in turn, were more likely to be a member of Class 3 than Class 1.

Our final mediational analysis tested whether perceptions of invincibility predicted Class 1 vs. 3 membership indirectly through alcohol consumption (see Table 3.3 and Figure 3.6). Perception of invincibility predicted alcohol consumption ($b=0.28$, $p<.001$) but not religious group classification ($b=-0.03$, $p>.05$). Alcohol consumption predicted religious group classification ($b=0.18$, $p<.001$) and the overall indirect effect of perceived invincibility on religious group membership was significant: $b=0.05$, $p<.05$. Thus, Class 3 students perceived themselves to be more invincible, and in turn, consumed more alcohol than Class 1 students.

Table 3.1 Descriptive statistics of key study variables

<i>Variable</i>	<i>Mean</i>	<i>SD</i>
<i>Model Variables</i>		
Alcohol Use	3.16	2.70
Religious Beliefs	4.03	1.02
Religious Behaviors	3.74	1.93
Lack of Planning	1.87	0.46
Lack of Perseverance	1.89	0.44
Sensation Seeking	2.74	0.57
Positive Urgency	1.78	0.57
Negative Urgency	2.16	0.57
Neuroticism	2.77	0.61
Conscientiousness	3.78	0.54
Agreeableness	3.90	0.50
Perceptions of Invincibility	2.85	0.48

Note: N = 411

Table 3.2 Mediation tests of select personality traits on the prediction of alcohol consumption

	Beta	Z Score	<i>p</i> value
<i>Test 1: Religious Class 1 vs. 3</i>			
Lack of Planning → Religious Class → Alcohol	-0.01	-0.90	0.19
Lack of Perseverance → Religious Class → Alcohol	0.00	0.36	0.36
Sensation Seeking → Religious Class → Alcohol	0.01	1.32	0.09
Positive Urgency → Religious Class → Alcohol	0.02	1.43	0.08
Negative Urgency → Religious Class → Alcohol	0.01	0.78	0.22
<i>Test 2: Religious Class 2 vs. 3</i>			
Lack of Planning → Religious Class → Alcohol	-0.02	-1.39	0.09
Lack of Perseverance → Religious Class → Alcohol	-0.02	-1.24	0.11
Sensation Seeking → Religious Class → Alcohol	0.00	0.50	0.31
Positive Urgency → Religious Class → Alcohol	0.00	0.25	0.40
Negative Urgency → Religious Class → Alcohol	-0.01	-1.03	0.15

Note. *N* = 251 for Test 1. *N*=237 for Test 2. Religious Class 1 = High religious beliefs and high religious behaviors. Religious Class 2 = Low religious beliefs and low religious behaviors. Religious Class 3 = High religious beliefs and low religious behaviors. Reported effects are standardized. All *p*-values are one-tailed.

Table 3.3 Mediation tests of select personality traits on the prediction of religious group classification

	Beta	Z Score	<i>p</i> value
Religious Class 1 vs. 3			
Lack of Planning → Alcohol → Religious Class	0.06	2.41	0.01
Lack of Perseverance → Alcohol → Religious Class	0.03	2.05	0.02
Sensation Seeking → Alcohol → Religious Class	0.05	1.97	0.02
Positive Urgency → Alcohol → Religious Class	0.04	1.88	0.03
Negative Urgency → Alcohol → Religious Class	0.04	2.00	0.02
Neuroticism → Alcohol → Religious Class	-0.00	-0.18	0.43
Conscientiousness → Alcohol → Religious Class	-0.04	-2.14	0.02
Agreeableness → Alcohol → Religious Class	-0.19	-2.99	0.00

Note. N=251. Religious Class 1 = High religious beliefs and high religious behaviors. Religious Class 2 = Low religious beliefs and low religious behaviors. Religious Class 3 = High religious beliefs and low religious behaviors. Reported effects are standardized. All *p*-values are one-tailed.

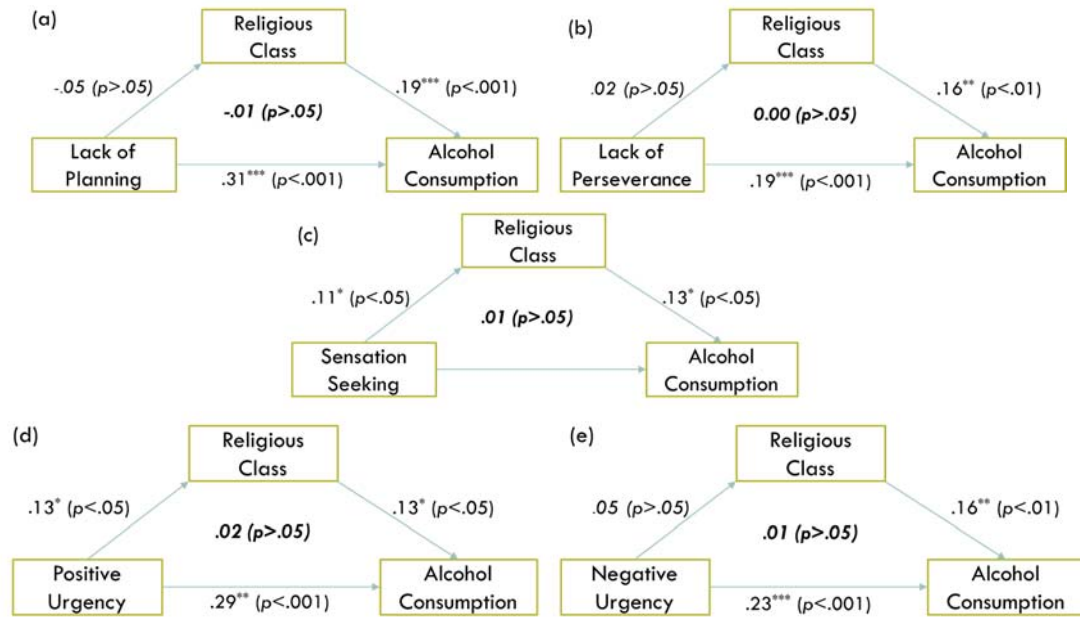


Figure 3.1 Tests of impulsigenic personality trait mediational model for Class 1 versus Class 3. This figure illustrates the tests of a cross-sectional model in which the association between five impulsigenic personality traits ((a) lack of planning, (b) lack of perseverance), (c) sensation seeking, (d) positive urgency, and (e) negative urgency) and alcohol consumption is mediated by religious classification. These models compare Class 1 (high religious beliefs and high religious behaviors) and Class 3 (high religious beliefs and low religious behaviors) students.

Note: Values shown outside of parentheses are standardized betas, p -values are shown in parentheses, and tests for the significance of the indirect effect are shown in the middle of each model.

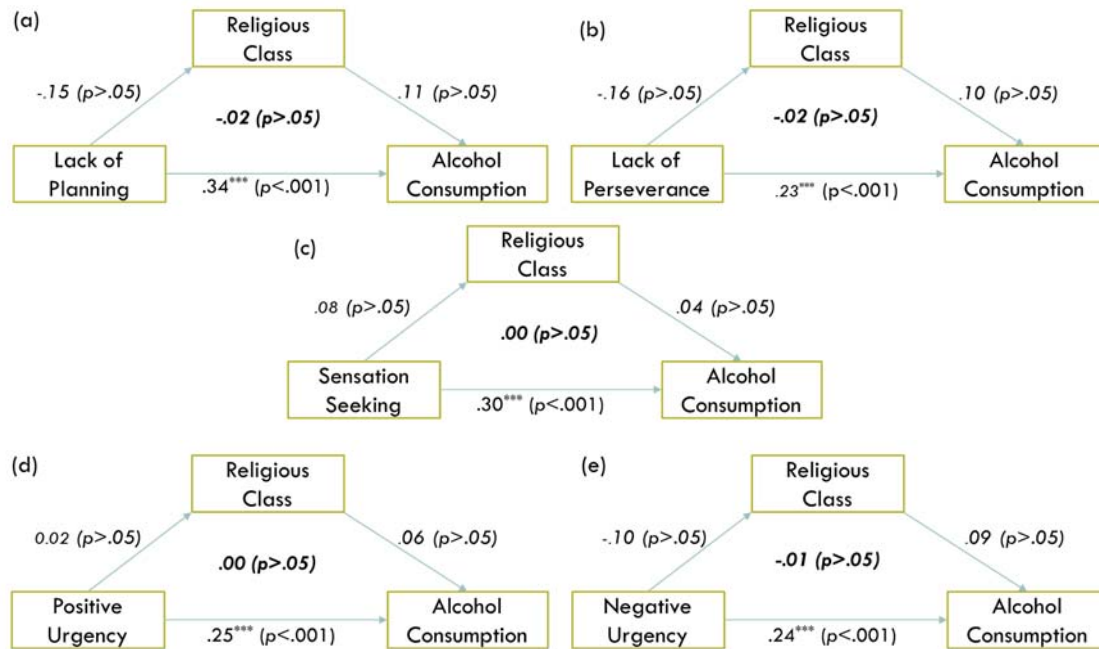


Figure 3.2 Tests of impulsigenic personality trait mediational model for Class 2 versus Class 3. This figure illustrates the tests of a cross-sectional model in which the association between five impulsigenic personality traits ((a) lack of planning, (b) lack of perseverance), (c) sensation seeking, (d) positive urgency, and (e) negative urgency) and alcohol consumption is mediated by religious classification. These models compare Class 2 (low religious beliefs and low religious behaviors) and Class 3 (high religious beliefs and low religious behaviors) students.

Note: Values shown outside of parentheses are standardized betas, p -values are shown in parentheses, and tests for the significance of the indirect effect are shown in the middle of each model.

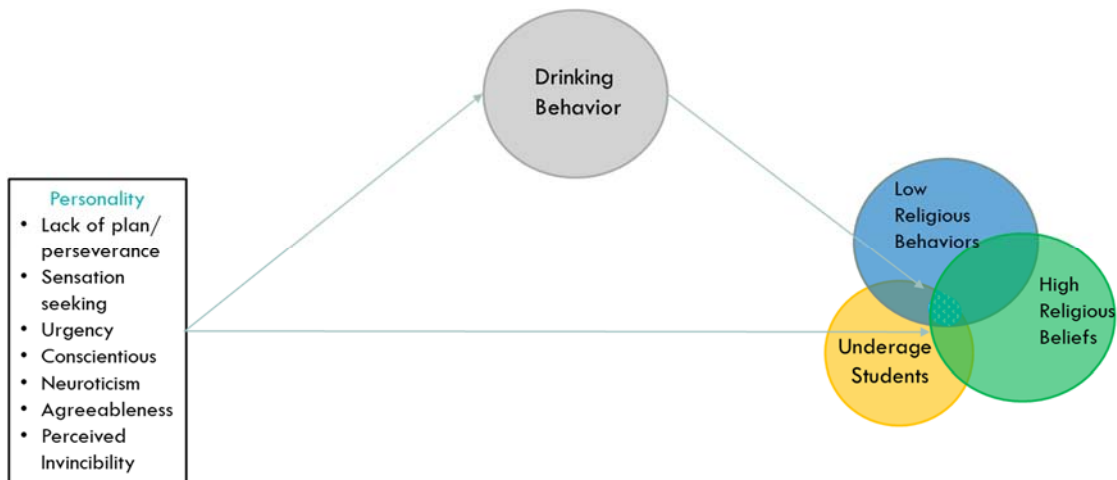


Figure 3.3 Alternative hypothesized cross-sectional mediational model. Following a failure to find supportive evidence for the originally proposed mediational model, the proposed mediational model was updated. The alternative model hypothesized that underage drinking behavior would mediate the association between select personality traits and religious discordance (i.e. high religious beliefs unsupported by religious behaviors).

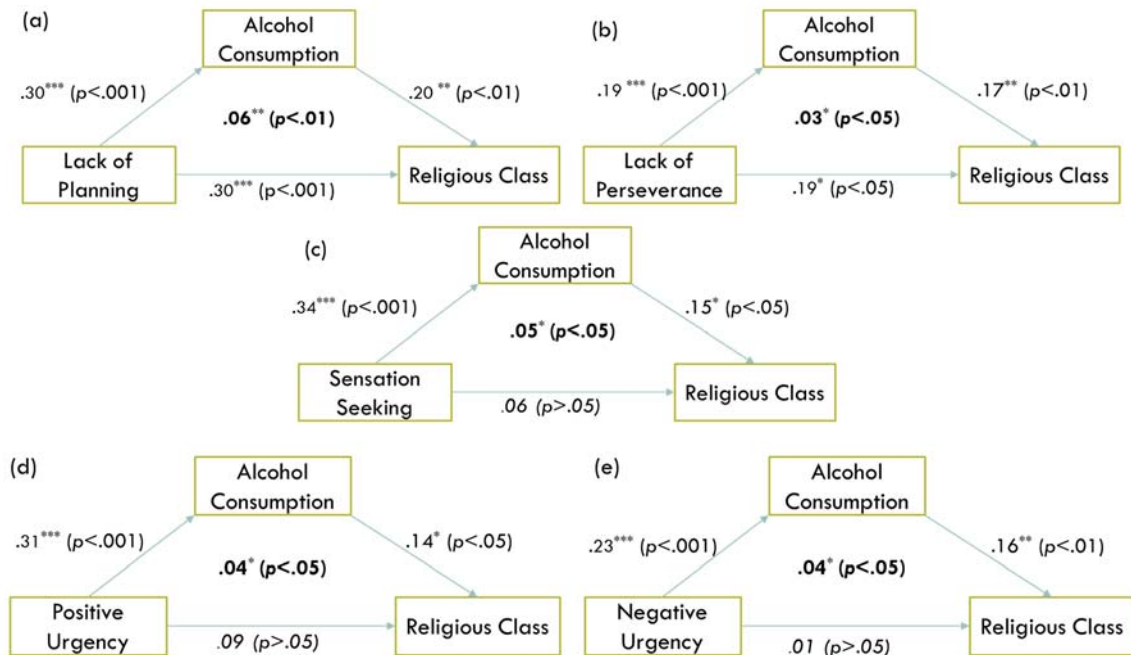


Figure 3.4. Tests of underage drinking mediational model for impulsogenic personality traits and Class 1 versus Class 3. This figure illustrates the tests of a cross-sectional model in which the association between five impulsogenic personality traits ((a) lack of planning, (b) lack of perseverance), (c) sensation seeking, (d) positive urgency, and (e) negative urgency) and religious classification is mediated by underage alcohol consumption. These models compare Class 1 (high religious beliefs and high religious behaviors) and Class 3 (high religious beliefs and low religious behaviors) students.

Note: Values shown outside of parentheses are standardized betas, p -values are shown in parentheses, and tests for the significance of the indirect effect are shown in the middle of each model.

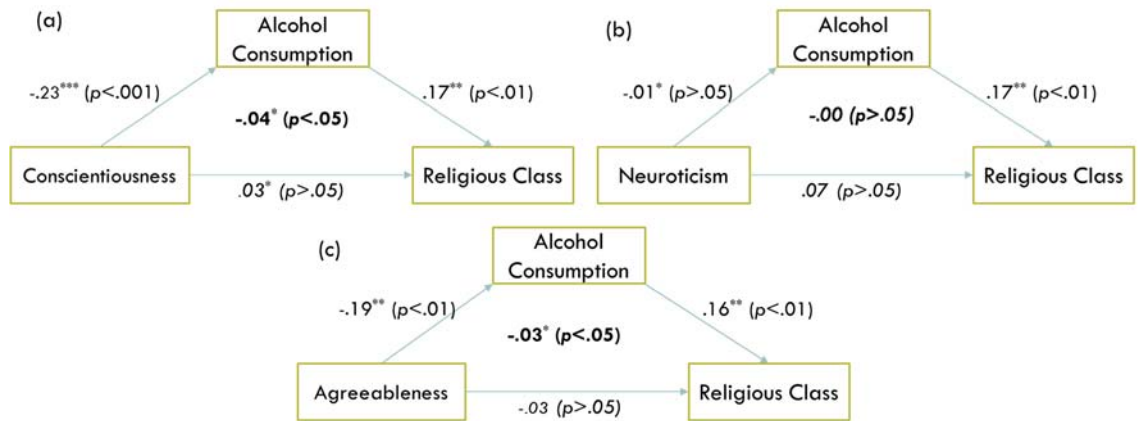


Figure 3.5 Tests of underage drinking mediational model for broad personality trait domains and Class 1 versus Class 3. This figure illustrates the tests of a cross-sectional model in which the association between three broad personality trait domains ((a) Conscientiousness, (b) Neuroticism), and (c) Agreeableness) and religious classification is mediated by underage alcohol consumption. These models compare Class 1 (high religious beliefs and high religious behaviors) and Class 3 (high religious beliefs and low religious behaviors) students.

Note: Values shown outside of parentheses are standardized betas, p -values are shown in parentheses, and tests for the significance of the indirect effect are shown in the middle of each model.

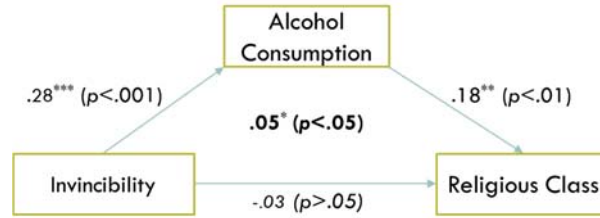


Figure 3.6 Tests of underage drinking mediational model for perceptions of invincibility and Class 1 versus Class 3. This figure illustrates the test of a cross-sectional model in which the association between perceptions of invincibility and religious classification is mediated by underage alcohol consumption. This model compare Class 1 (high religious beliefs and high religious behaviors) and Class 3 (high religious beliefs and low religious behaviors) students.

Note: Values shown outside of parentheses are standardized betas, p -values are shown in parentheses, test for the significance of the indirect effect are shown in the middle of the model.

CHAPTER FOUR: DISCUSSION

Past research has shown that students with high religious beliefs but discordant religious behaviors have higher rates of underage drinking than their peers with high religious beliefs and high religious behaviors, and rates that equal or exceed those of non-religious peers (Brechtling et al., 2010, Cole et al., under review). Additional studies have demonstrated these same students also face a heightened risk of drug use (Cole et al., under review) and risky sexual practices (Prassel et al., in preparation). The current study hoped to better understand what is driving the risk status of these students. In other words, is the mere presence of discordant religious beliefs and behaviors causing underage drinking or are both outcomes the result of another construct? The present study used cross-sectional mediational models to determine if select personality constructs could be used to predict discordancy of religious beliefs and behaviors in addition to alcohol consumption.

Although our study hypothesized that variations in impulsogenic, neurotic, conscientious, agreeable, and perceived invincibility personality traits would predict variations in religious beliefs/behavior concordance and ultimately variations in alcohol consumption, we found no evidence to support this model. Students with strong religious beliefs but discordant religious behaviors reported rates of underage drinking that were significantly higher than students with strong religious beliefs and frequent religious behaviors and comparable to those of non-religious students. All five impulsogenic personality traits along with one exploratory personality variable (perceptions of invincibility) positively predicted alcohol consumption; however, none of the eleven indirect effects testing the proposed mediational model were significant. Thus, given the current sample size and study design, we did not find evidence to support the idea that

religious beliefs/behavior discordance mediates the relationship between these select personality traits and underage drinking.

Conversely, there was evidence to support an alternative model- that personality may influence alcohol consumption which in turns affects the concordance of religious beliefs and behaviors. Findings indicated that students high in six personality traits (lack of planning, lack of perseverance, sensation seeking, positive urgency, negative urgency, and perceived invincibility) were more likely to drink underage and to have discordant religious beliefs and behaviors. Similar patterns were found for students low in Conscientiousness and Agreeableness. Thus, it appears that our group of concern (students with discordant religious beliefs and behaviors) may partly be at risk due to pre-existing personality traits that make them more impulsive, less planful and agreeable, and less accurate at assessing their own risk of harm. Perhaps more importantly though, our findings indicate that one of the greatest reasons these students are at risk is *because* they drink heavily. This is in direct contrast with past studies that have posited this group of students drink heavily as a result of their religious discordancy (Brechtling et al., 2010).

In total, statistical tests for eight out of nine mediational models were consistent with the possibility that the relationship between select personality traits and religiosity functions indirectly through use of alcohol. These findings suggest there may still be a psychosocial model at work but it appears more likely to function through early personality traits predisposing students to have early, underage experiences with alcohol that in turn, lead them to forgo behaviors (e.g., praying and attending religious services) that could offer them protection against risky activities. Previous research has well established that impulsive personality is highly predictive of underage drinking (Berg et

al., 2015; Cyders et al., 2009; Settles et al., 2010). Cole et al., (under review) previously speculated that drinking itself may prove to be incompatible with some regular religious practices (e.g., Saturday night drinking may make it difficult to attend Sunday morning religious services). Furthermore, as many religious organizations prohibit underage drinking, students who have begun experimenting with alcohol may be faced with uncomfortable cognitive dissonance if they were to attend religious services condemning such practices. This may lead them to forgo religious behaviors while still maintaining their belief systems. Together, these theories offer further support for a model in which personality predisposes some students to drink underage and those early experiences with alcohol make them vulnerable to developing a discordance between their religious beliefs and behaviors.

It is important to note that although we did not find support for a model in which select personality traits influenced underage drinking indirectly through religious discordance, our findings do not suggest that religious discordance is not predictive of high-risk alcohol consumption. Our findings are in line with those of past researchers who have shown that students who fail to support their religious beliefs with consistent religious behaviors report significantly higher rates of underage drinking than peers with concordantly high religious beliefs and behaviors (Brechtling et al., 2010, Cole et al., under review). Consistent with Brechtling and colleagues (2010), we found that students with discordant religious beliefs and behaviors report rates of underage drinking similar to those of non-religious students. These findings emphasize the need for researchers to differentiate between religious beliefs and behaviors as not all aspects of religiosity offer broad protection from risk.

Additionally, when taken with past findings, our research offers some support for the idea that students with discordant religious beliefs and behaviors may face an increased risk of harm that extends beyond what could be expected due to underage drinking alone. Cole et al. (under review) found that more than any other group, students with discordant beliefs and behaviors reported they perceived alcohol to be more readily available, to enjoy drinking more, and to be surrounded by peers who drink heavily. Although these researchers did not test the alternative direction (that underage drinking predicts these mediational variables which lead to religious discordance), we cannot rule out that these relationships still exist. Thus, although religious discordance was best predicted by underage drinking, religious discordance may in turn influence peer selection, alcohol availability, and affect experienced while drinking that predisposes students to further risk of alcohol abuse. Other high-risk behaviors associated with religious discordance, such as drug use (Cole et al., under review) and risky sex (Prassel et al, in preparation), likely further increase these students' risk of harm.

The current study has important implications for intervention. As evidence continues to mount that students with discordant religious beliefs and behaviors represent an at risk group, researchers may be tempted to try to intervene with students' religious discordancy. However, our findings suggest that interventions that hope to reduce alcohol consumption by helping to bring students' religious beliefs and behaviors in line are likely to be met with limited success. Instead, our study offers support for the idea that interventions designed to reduce underage drinking may have the added benefit of protecting religious concordance. Researchers have shown that early drinking onset is associated with an increased risk of alcohol abuse (Behrendt, Wittchen, Höfler, Lieb, &

Beesdo, 2009, Grant & Dawson, 1997), unintentional injury (Hingson, Heeren, Jamanka, & Howland, 2000), and unplanned and unprotected sex (Hingson, Heeren, Winter, & Wechsler, 2003). Thus, interventions designed to delay drinking onset could shield students from immediate harms while also helping to prevent reciprocal risk cycles between impulsive personality styles and alcohol consumption (Riley et al., 2016) and possibly religiosity and alcohol consumption. Although empirical support for interventions designed to delay drinking onset is quite limited, there is modest support for school and family interventions that utilize social and emotional skills training for children in elementary (Hawkins et al., 1992) and middle school (Spath, Redmond, & Shin, 2001, Spoth, Randall, Shin, & Redmond, 2005).

The findings of the current study must be considered in the context of the study's limitations. Of primary concern is the study's reliance on cross-sectional data. Although the use of a cross-sectional design was intentional (given the limited available research we wanted to confirm hypothesized relationships were present cross-sectionally before proceeding with costly, longitudinal tests), the use of cross-sectional data means we can only speculate about the temporal relationships between variables. Our study offers stronger support for some directional effects over others; however, longitudinal data collections are needed to confirm our findings including that experiences with alcohol precede changes in religious beliefs and behaviors.

There are additional aspects of study design that could be considered limitations. In order to create our religious classification groups we had to dichotomize students by religious beliefs and behaviors. This procedure artificially classifies students into one extreme or the other and limits our power to detect individual differences and more

complex relationships between variables. Next, although our proposed mediational models were not significant, most of the proposed relationships between variables were in the proposed direction but were very small in magnitude. Although our sample allowed us adequate power to detect our originally predicted effects, it is possible that with a larger sample size, we could have detected even smaller effects. In a similar vein, due to a lack of significant findings and concerns of committing Type I errors, we did not conduct all of our originally proposed analyses. We cannot rule out the possibility that we would have found significant indirect effects had we followed through with all proposed analyses.

An additional study limitation is a reliance on a self-report measure of alcohol use. Although self-report data have been shown to be reliable and valid assessments of alcohol consumption in adolescents (Winters, Stinchfield, Henly, & Schwartz, 1990), we were asking students to report their participation in illegal underage drinking which could minimize reporting of alcohol consumption. AUDIT scores for our study were lower than expected; we cannot determine whether low means are an accurate reflection of a low-drinking sample (due to chance or self-selection into the study) or an inaccurate reflection of the sample (due to intentional under-reporting or poor reporting ability). It is possible our results would not replicate in a sample reporting greater alcohol consumption.

Similarly, limitations can be noted for our self-report measures of personality. Personality traits represent latent constructs; in order to assess said-constructs, participants must be able to accurately reflect on their own behaviors and internal experiences. Thus, our results reflect participants' assessment of their own personality and cannot be considered a truly objective measure. Like any study, results are dependent

on the measures used. We selected measures that we believed would most accurately assess our variables of interest. Although none of the personality traits we tested predicted religious discordance and in turn underage drinking, we cannot rule out the possibility that other personality traits may predict in this direction. Thus, our results should be interpreted in the context of the select personality traits tested and should not be generalized to all personality traits.

The present study used different measures than past authors to assess religious beliefs, religious behaviors, and alcohol consumption (Brechtling et al. 2010, Cole et al., under review, Prassel et al., in preparation). Although we have reason to believe the current measures are more accurate and valid measures of the constructs, it does limit our ability to make direct comparisons between the current study and earlier studies.

Unique sample characteristics may further limit generalizability of results. Females and non-Hispanic whites were over-represented in our sample. Furthermore, our sample was a convenience sample of underage college students drawn from a subject pool at one university and thus, may not be representative of samples of different ages, education levels, or institutions. Students varied greatly in their reported religious affiliation and past research has suggested that this may influence college students' drinking behaviors (Patock-Peckham, Hutchinson, Cheong, & Nagoshi, 1998). Future research should consider potential moderating effects of religious affiliation in addition to using a more diverse sample.

In summary, college students with strong religious beliefs unsupported by religious behaviors continue to report higher engagement in risk-taking behaviors than their peers with strong religious beliefs and frequent religious behaviors. Although we

did not find evidence to support that religious discordance mediates between select personality traits and underage drinking, we found cross-sectional evidence consistent with an alternative hypothesized psychosocial model that suggests impulsivity, perceived invincibility, and low Conscientiousness and Agreeableness predict underage drinking and in turn, discordance between religious beliefs and behaviors. These findings emphasize the need for early drinking interventions that focus on impulsive personality and/or drinking behaviors over addressing religious behaviors that are not consistent with religious beliefs.

APPENDIX: MEASURES

Religious Beliefs Questionnaire

1. How much is religion a source of strength and comfort to you?
 - a. A great deal
 - b. A little
 - c. None

2. Do you believe there is a life after death?
 - a. Yes
 - b. No
 - c. Undecided

3. God's goodness and love are greater than we can possibly imagine
 - a. Agree strongly
 - b. Agree somewhat
 - c. Can't decide
 - d. Disagree somewhat
 - e. Disagree strongly

4. Despite all the things that go wrong, the world is still moved by love
 - a. Agree strongly
 - b. Agree somewhat
 - c. Can't decide
 - d. Disagree somewhat
 - e. Disagree strongly

5. When faced with a tragic event I try to remember that God still loves me and that there is hope for the future
 - a. Agree strongly
 - b. Agree somewhat
 - c. Can't decide
 - d. Disagree somewhat
 - e. Disagree strongly

6. I feel that it is important for my children to believe in God
 - a. Agree strongly
 - b. Agree somewhat
 - c. Can't decide
 - d. Disagree somewhat
 - e. Disagree strongly

7. I think that everything that happens has a purpose
 - a. Agree strongly
 - b. Agree somewhat
 - c. Can't decide
 - d. Disagree somewhat
 - e. Disagree strongly

Religious Behaviors Questionnaire

1. How often do you pray privately in places other than at church or synagogue?
 - a. Never
 - b. Less than once a month
 - c. Once a month
 - d. A few times a month
 - e. Once a week
 - f. A few times a week
 - g. Once a day
 - h. Several times a day

2. How often do you watch or listen to religious programs on TV or radio?
 - a. Never
 - b. Less than once a month
 - c. Once a month
 - d. A few times a month
 - e. Once a week
 - f. A few times a week
 - g. Once a day
 - h. Several times a day

3. How often do you read the bible or other religious literature?
 - a. Never
 - b. Less than once a month
 - c. Once a month
 - d. A few times a month
 - e. Once a week
 - f. A few times a week
 - g. Once a day
 - h. Several times a day

4. How often are prayers or grace said before or after meals in your current residence?
 - a. Never
 - b. Only on special occasions
 - c. At least once a week
 - d. Once a day
 - e. At all meals

5. How often do you attend religious service?
 - a. Never
 - b. Less than once a year
 - c. About once or twice a year
 - d. Several times a year
 - e. About once a month
 - f. 2-3 times a month
 - g. Nearly every week
 - h. Every week
 - i. Several times a week

6. Besides religious services, how often do you take part in other activities at a place of worship?
- a. Never
 - b. Less than once a year
 - c. About once or twice a year
 - d. Several times a year
 - e. About once a month
 - f. 2-3 times a month
 - g. Nearly every week
 - h. Every week
 - i. Several times a week

Drinking Behavior Questionnaire: Alcohol Use Disorders Test (AUDIT)

It is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest. Please mark the box that best describes your answer to each question.

“Drinking alcohol” refers to drinking any beverage with alcohol in it such as beer, wine, whiskey, liquor, rum, scotch, vodka, gin, or alcoholic mixed drinks. Also, “a drink” is more than just a sip or a taste. (A sip or a taste is just a small amount or part of someone else’s drink or only a swallow or two. A drink would be more than that.)

	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
4. How often during the last year 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 year 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 year have you needed a first drinking 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 year 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 year have you been unable to remember what happened the night before because you were drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9. Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year

Impulsigenic Personality Trait Questionnaire: UPPS-P

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. If you **Agree Strongly** circle **1**, if you **Agree Somewhat** circle **2**, if you **Disagree Somewhat** circle **3**, and if you **Disagree Strongly** circle **4**. Be sure to indicate your agreement or disagreement for every statement below.

	Agree Strongly	Agree Some	Disagree Some	Disagree Strongly
1. I have a reserved and cautious attitude toward life.	1	2	3	4
2. I have trouble controlling my impulses.	1	2	3	4
3. I generally seek new and exciting experiences and sensations.	1	2	3	4
4. I generally like to see things through to the end.	1	2	3	4
5. When I am very happy, I can't seem to stop myself from doing things that can have bad consequences.	1	2	3	4
6. My thinking is usually careful and purposeful.	1	2	3	4
7. I have trouble resisting my cravings (for food, cigarettes, etc.).	1	2	3	4
8. I'll try anything once.	1	2	3	4
9. I tend to give up easily.	1	2	3	4
10. When I am in great mood, I tend to get into situations that could cause me problems.	1	2	3	4
11. I am not one of those people who blurt out things without thinking.	1	2	3	4
12. I often get involved in things I later wish I could get out of.	1	2	3	4
13. I like sports and games in which you have to choose your next move very quickly.	1	2	3	4
14. Unfinished tasks really bother me.	1	2	3	4
15. When I am very happy, I tend to do things that may cause problems in my life.	1	2	3	4
16. I like to stop and think things over before I do them.	1	2	3	4
17. When I feel bad, I will often do things I later regret in order to make myself feel better now.	1	2	3	4
18. I would enjoy water skiing.	1	2	3	4
19. Once I get going on something I hate to stop.	1	2	3	4
20. I tend to lose control when I am in a great mood.	1	2	3	4
21. I don't like to start a project until I know exactly how to proceed.	1	2	3	4

22. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.	1	2	3	4
23. I quite enjoy taking risks.	1	2	3	4
24. I concentrate easily.	1	2	3	4
25. When I am really ecstatic, I tend to get out of control.	1	2	3	4
26. I would enjoy parachute jumping.	1	2	3	4
27. I finish what I start.	1	2	3	4
28. I tend to value and follow a rational, "sensible" approach to things.	1	2	3	4
29. When I am upset I often act without thinking.	1	2	3	4
30. Others would say I make bad choices when I am extremely happy about something.	1	2	3	4
31. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.	1	2	3	4
32. I am able to pace myself so as to get things done on time.	1	2	3	4
33. I usually make up my mind through careful reasoning.	1	2	3	4
34. When I feel rejected, I will often say things that I later regret.	1	2	3	4
35. Others are shocked or worried about the things I do when I am feeling very excited.	1	2	3	4
36. I would like to learn to fly an airplane.	1	2	3	4
37. I am a person who always gets the job done.	1	2	3	4
38. I am a cautious person.	1	2	3	4
39. It is hard for me to resist acting on my feelings.	1	2	3	4
40. When I get really happy about something, I tend to do things that can have bad consequences	1	2	3	4
41. I sometimes like doing things that are a bit frightening.	1	2	3	4
42. I almost always finish projects that I start.	1	2	3	4
43. Before I get into a new situation I like to find out what to expect from it.	1	2	3	4
44. I often make matters worse because I act without thinking when I am upset.	1	2	3	4
45. When overjoyed, I feel like I can't stop myself from going overboard.	1	2	3	4
46. I would enjoy the sensation of skiing very fast down a high mountain slope.	1	2	3	4
47. Sometimes there are so many little things to be done that I just ignore them all.	1	2	3	4
48. I usually think carefully before doing anything.	1	2	3	4

49. When I am really excited, I tend not to think of the consequences of my actions.	1	2	3	4
50. In the heat of an argument, I will often say things that I later regret.	1	2	3	4
51. I would like to go scuba diving.	1	2	3	4
52. I tend to act without thinking when I am really excited.	1	2	3	4
53. I always keep my feelings under control	1	2	3	4
54. When I am really happy, I often find myself in situations that I normally wouldn't be comfortable with.	1	2	3	4
55. Before making up my mind, I consider all the advantages and disadvantages.	1	2	3	4
56. I would enjoy fast driving.	1	2	3	4
57. When I am very happy, I feel like it is ok to give in to cravings or overindulge.	1	2	3	4
58. Sometimes I do impulsive things that I later regret.	1	2	3	4
59. I am surprise at the things I do while in a great mood.	1	2	3	4

Neuroticism Trait Domain Questionnaire: IPIP-120 Neuroticism Scale

The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then click the circle that corresponds to the accuracy of the statement.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
1. Worry about things	1	2	3	4	5
2. Fear for the worst	1	2	3	4	5
3. Am afraid of many things	1	2	3	4	5
4. Get stressed out easily	1	2	3	4	5
5. Get angry easily	1	2	3	4	5
6. Get irritated easily	1	2	3	4	5
7. Lose my temper	1	2	3	4	5
8. Am not easily annoyed	1	2	3	4	5
9. Often feel blue	1	2	3	4	5
10. Dislike myself	1	2	3	4	5
11. Am often down in the dumps	1	2	3	4	5
12. Feel comfortable with myself	1	2	3	4	5
13. Find it difficult to approach others	1	2	3	4	5
14. Am afraid to draw attention to myself	1	2	3	4	5
15. Only feel comfortable with friends	1	2	3	4	5
16. Am not bothered by difficult social situations	1	2	3	4	5
17. Go on binges	1	2	3	4	5

18. Rarely overindulge	1	2	3	4	5
19. Easily resist temptations	1	2	3	4	5
20. Am able to control my cravings	1	2	3	4	5
21. Panic easily	1	2	3	4	5
22. Become overwhelmed by events	1	2	3	4	5
23. Feel that I am unable to deal with things	1	2	3	4	5
24. Remain calm under pressure	1	2	3	4	5

Conscientiousness Trait Domain Questionnaire: IPIP-120 Conscientiousness Scale

The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then click the circle that corresponds to the accuracy of the statement.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
1. Complete tasks successfully	1	2	3	4	5
2. Excel in what I do	1	2	3	4	5
3. Handle tasks smoothly	1	2	3	4	5
4. Know how to get things done	1	2	3	4	5
5. Like to tidy up	1	2	3	4	5
6. Often forget to put things back in their proper place	1	2	3	4	5
7. Leave a mess in my room	1	2	3	4	5
8. Leave my belongings around	1	2	3	4	5
9. Keep my promises	1	2	3	4	5
10. Tell the truth	1	2	3	4	5
11. Break rules	1	2	3	4	5
12. Break my promises	1	2	3	4	5
13. Work hard	1	2	3	4	5
14. Do more than what's expected of me	1	2	3	4	5
15. Do just enough work to get by	1	2	3	4	5
16. Put little time and efforts into my work	1	2	3	4	5
17. Am always prepared	1	2	3	4	5

18. Carry out my plans	1	2	3	4	5
19. Waste my time	1	2	3	4	5
20. Have difficulty starting tasks	1	2	3	4	5
21. Jump into things without thinking	1	2	3	4	5
22. Make rash decisions	1	2	3	4	5
23. Rush into things	1	2	3	4	5
24. Act without thinking	1	2	3	4	5

Agreeableness Trait Domain Questionnaire: IPIP-120 Agreeableness Scale

The following pages contain phrases describing people's behaviors. Please use the rating scale next to each phrase to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then click the circle that corresponds to the accuracy of the statement.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate
1. Trust others	1	2	3	4	5
2. Believe that others have good intentions	1	2	3	4	5
3. Trust what people say	1	2	3	4	5
4. Distrust people	1	2	3	4	5
5. Use others for my own needs	1	2	3	4	5
6. Cheat to get ahead	1	2	3	4	5
7. Take advantage of others	1	2	3	4	5
8. Obstruct others' plans	1	2	3	4	5
9. Love to help others	1	2	3	4	5
10. Am concerned about others	1	2	3	4	5
11. Am indifferent to the feelings of others	1	2	3	4	5
12. Take no time for others	1	2	3	4	5
13. Love a good fight	1	2	3	4	5
14. Yell at people	1	2	3	4	5
15. Insult people	1	2	3	4	5
16. Get back at others	1	2	3	4	5
17. Believe that I am better than others	1	2	3	4	5
18. Think highly of myself	1	2	3	4	5
19. Have a high opinion of myself	1	2	3	4	5

20. Boast about my virtues	1	2	3	4	5
21. Sympathize with the homeless	1	2	3	4	5
22. Feel sympathy for those who are worse off than myself	1	2	3	4	5
23. Am not interested in other people's problems	1	2	3	4	5
24. Try not to think about the needy	1	2	3	4	5

Perceptions of Invincibility Questionnaire: The Adolescent Invincibility Tool (AIT)

We are interested in how adolescents think about themselves, others, and everyday life situations. Below are a series of statements about situations that you may have encountered. There are no right or wrong answers. Read each statement and then check the response to the right that most nearly agrees with how you think, feel, or act in most situations. Click on one of the numbers on each line to indicate whether you “strongly agree,” “agree,” “neither agree nor disagree,” “disagree,” or “strongly disagree” with each statement.

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
1. I like to be the first person that tries something new.	1	2	3	4	5
2. I can talk my way out of most problems.	1	2	3	4	5
3. I like to experiment with things that others say may hurt me.	1	2	3	4	5
4. I do not care what others think about me.	1	2	3	4	5
5. I think of myself as having more ability than others.	1	2	3	4	5
6. It does not matter if I do dangerous things; I know I will be safe.	1	2	3	4	5
7. Bad things do not happen to me.	1	2	3	4	5
8. I am the kind of person who likes to take risks.	1	2	3	4	5
9. I like to have uncertainty in my life.	1	2	3	4	5
10. I do not get hurt when I do risky things.	1	2	3	4	5
11. I am the type of person who needs to experience things for myself.	1	2	3	4	5
12. I get away with just about everything.	1	2	3	4	5
13. People say that I am a show off.	1	2	3	4	5
14. I do not worry about tomorrow.	1	2	3	4	5

15. I like to do things that others think are cool.	1	2	3	4	5
16. I tend to think that consequences or risks will not happen to me.	1	2	3	4	5
17. I do not see myself getting STDs, including HIV/AIDS	1	2	3	4	5
18. I like a challenge.	1	2	3	4	5
19. I think of myself as being better than others.	1	2	3	4	5
20. I like to be different.	1	2	3	4	5
21. It is easy for me to overcome obstacles.	1	2	3	4	5
22. I like to be my own person.	1	2	3	4	5
23. I tend to do things my way no matter what anyone else says.	1	2	3	4	5
24. I like to take dares.	1	2	3	4	5
25. My friends say that I am adventurous.	1	2	3	4	5

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PROFESSIONAL POSITIONS

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Undergraduate Research Assistant Butler University, Indianapolis, IN	Jan. 2011 – May 2013
Summer Research Intern The Kinsey Institute for Research in Sex, Gender, and Reproduction, Indianapolis, IN	May – Aug. 2011

SCHOLASTIC AND PROFESSIONAL HONORS

Aug. 2013-May 2016	Psychology Add-on Award
Aug. 2013-May 2014	Kentucky Opportunity Fellowship
May 2013	High Honors Certification in Psychology
May 2013	Sally Bell Beck Award
Aug. 2012-May 2013	Butler University Top 10 Outstanding Women Award
Aug. 2012-May 2013	Hargrove Family Scholarship
Aug. 2011-May 2012	Butler University Top 100 Outstanding Student Award
Aug. 2011-May 2013	College of Liberal Arts and Sciences Dean's List
Aug. 2009-May 2010	Parkland College Dean's List
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PROFESSIONAL PUBLICATIONS

- Cole, H.A.**, Prassel, H.B., & Carlson, C.R. (Under review). A meta-analysis of computer-delivered drinking interventions for college students: A comprehensive review of studies from 2010-2016.
- Cole, H. A.**, Prassel, H.B., Carlson, C.R., & Keller, P.S. (Under review). Religious beliefs and behaviors as predictors of underage drinking and drug use among college students
- Cole, H. A.**, Peterson, S.J., & Smith, G.T. (Under review). Biological, Behavioral, and Personality Predictors of Adolescents' Preferred Style of Coping.
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