

RELIGIOSITY-RISK BEHAVIOR MODEL

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL  
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE

UNIVERSITY OF FLORIDA

2008

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To my Aunt Rhonda

## ACKNOWLEDGMENTS

I thank James Shepperd for his guidance and support. In addition, I would like to thank Kate Sweeny, Cathy Cottrell, James Algina, and Julia Graber for their invaluable comments and suggestions.

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Abstract of Thesis Presented to the Graduate School  
of the University of Florida in Partial Fulfillment of the  
Requirements for the Degree of Master of Science

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December 2008

Chair: James Shepperd

Major: Psychology

I propose a framework for understanding religiosity and risk behavior (Religiosity and Risk Behavior Model) that specifies a variety of upstream features of religiosity (prescriptions for behavior, peer/adults models, decreased opportunity, and coping strategies) and downstream features of religiosity (risk related cognitions, risk perceptions, decreased behavioral willingness) that are responsible for lower rates of risky behavior among religious adolescents.

Undergraduates (N = 272) completed an online questionnaire that measured religiosity, illicit drug use, and the upstream and downstream features of religiosity. Analysis using structural equation modeling generally supported our theoretical model. Religious adolescents were less likely to report using illicit drugs and the link between religiosity and drug use was mediated through paths specified in our model.

## CHAPTER 1 INTRODUCTION

### **Adolescent Risk Behavior**

Adolescence is a time of increased risky behavior. A recent survey revealed that 19% of high school seniors reported smoking cigarettes on a regular basis, 49.8% reported using alcohol in the past 30 days, and 29.7% binge drank in the past two weeks (Johnston, O'Malley, & Bachman, 2002). Although some risk-taking may be a positive force in development (Baumrind, 1987; Moore & Parsons, 2000; Shedler & Block, 1990), chronic risk-taking and risky activities such as illegal drug use and unprotected sexual intercourse can be dangerous. Risk behavior can produce long-term negative consequences. For instance, each year approximately one million adolescent girls become pregnant in the United States (Fielding & Williams, 1991), and 3 million adolescents are diagnosed with a sexually transmitted disease (Centers for Disease Control & Preventions, 2004).

Importantly, not all adolescents engage in risky behavior. For example, girls are less likely than boys to engage in risky behavior (Tuinstra, Groothoff, Van Den Heuvel, & Post, 1998; Weden & Zabin, 2005) and younger adolescents are less likely than older adolescents (Resnick, Bearman, Blum, Bauman, Harris, Jones, et al., 1997). These demographic differences aside, one individual difference variable consistently linked to lower risk behavior is religiosity. Adolescents who score high on measures of religiosity (religious adolescents) are less likely than adolescents who score low on such measures (non-religious adolescents) to engage in a host of risky behavior. For example, religious adolescents report that they are less likely to smoke cigarettes (Amey, Albrecht, & Miller, 1996; Dunn, 2005; Nonnemaker et al., 2003; Steinman & Zimmerman, 2004; Wallace & Forman, 1998), drink alcohol (Amey et al., 1996; Cochran & Akers, 1989; Dunn, 2005; Nonnemaker et al., 2003; Steinman & Zimmerman, 2004; Wallace &

Forman, 1998), use illicit drugs (Adlaf & Smart, 1985; Dunn, 2005; Miller, Davies, & Greenwald, 2000; Steinman & Zimmerman), and engage in sexual intercourse (DuRant, et al., 1990; Nonnemaker et al., 2003). In addition, religious adolescents are less likely to engage in violent behavior (Nonnemaker et al., 2003; Powell, 1997), and attempt suicide (Nonnemaker et al., 2003). These studies demonstrate that religiosity is an important correlate of risk behavior. They are limited, however, in that they do not provide insight into why religious adolescent are less likely to engage in risk behavior. The aim of the current investigation is to move the exploration of the link between religiosity and risk behavior beyond simple correlations by proposing a theoretical model that attempts to capture and understand this relationship. I will test the theoretical model on an undergraduate student sample. Although the typical age range of undergraduates falls at late adolescence, it nevertheless provides useful information. Consequences of risk behavior (e.g., unplanned pregnancy, drug addiction) can be just as destructive to late adolescents as to early and middle adolescence.

### **Historical Background of the Link Between Religion and Risk Behavior**

Much of the research examining religiosity before the late 1960s was problematic in that it often lacked a comparison group and results appeared biased in favor of the investigators views on religion (Powers, 1967). One notable exception was a study by Hirschi and Stark (1969) that explored the relationship between religiosity and delinquency. Hirschi and Stark found that church attendance was unrelated to six types of delinquent behavior. These delinquent behaviors included stealing (items less than \$2, items between \$2 and \$50, and items over \$50), stealing a car for a joy ride, “banging up property,” and fighting. The authors concluded that adolescents who attend church regularly are just as likely as adolescents who rarely or never attend church to commit delinquent acts. Religion simply did not matter.

Although methodologically, the study by Hirschi and Stark (1969) represented an improvement over prior studies of religiosity and risk behavior, it nevertheless had several limitations. First, Hirschi and Stark only examined a subset of delinquent behaviors (e.g., vandalism, assault, and larceny). Second, their conclusion that religion does not matter is too simplistic. Burkett and White (1974) argued that religion may do a good job of deterring delinquent behavior, but secular institutions (e.g., law enforcement, schools) may also deter delinquency. The behaviors examined by Hirschi and Stark include vandalism, assault, and larceny. Religious institutions do not condone behaviors such as stealing, but neither do school officials or the police. Thus, there are several potential sources from which adolescents can learn that stealing is wrong. Religion may not be needed to deter adolescents from stealing. On the other hand, religion should predict individual differences in engaging in “victimless” delinquent acts (e.g., drinking alcohol) because secular controls are less clear on these issues. Drinking alcohol under the age of 21 is illegal, but through the media, peers, and even parents, adolescents receive messages that condone underage drinking. Consistent with the prediction that religion is related to engagement in “victimless” delinquent acts, religious adolescents are less likely to drink alcohol and smoke marijuana (Amey et al., 1996; Burkett & White, 1974; Cochran & Akers, 1989; Dunn, 2005; Nonnemaker et al., 2003; Steinman & Zimmerman, 2004; Wallace & Forman, 1998).

Second, researchers have questioned the external validity of the Hirschi and Stark findings. Their sample consisted of middle and high school students in Northern California. Researchers in other parts of the country such as Atlanta (Higgins and Albrecht, 1977), Utah (Albrecht, Chadwick, & Alcorn, 1977), Arizona (Jensen & Erickson, 1979), and Idaho (Albrecht et al.,

1977) used procedures similar to Hirschi and Stark yet found a negative relationship between religion and delinquency – greater religiosity corresponded to lower delinquent behavior.

More recently, Stark (1996) proposed that religion deters delinquency only in regions where the majority of people are actively religious. Thus, no relationship emerged between religion and delinquency in Northern California sample because of low levels of religiosity on the west coast of the United States. Rates of church attendance in this region of the country are low (e.g., the rate of church attendance in Seattle is the lowest of any metropolitan area at 280 per 1,000), compared to others regions where the predicted relationship was found (e.g., the rate of church attendance in Provo, Utah is 966 per 1,000).

In support of this notion, Stark (1996) found that the correlation between church attendance and getting in trouble with the law was highest in the East (-.32), Midwest (-.36), and South (-.39), where church attendance is roughly 60%, lower in the Mountain region (-.23) where church attendance is roughly 48%, and near zero (-.02) in the Pacific region where church attendance is roughly 36%. Although this finding is supportive, the author acknowledges that region is a crude measure of the religious sentiments of a community. Further, this type of explanatory framework ignores several factors of an individual and his/her environment (e.g., attitudes, risk perceptions) that likely influence willingness to engage in risk behavior.

### **Potential Mechanisms of the Link between Religion and Risk Behavior**

Although several studies find a link between religiosity and risky behavior, researchers have a poor understanding of why the link exists. Little is known about what qualities religion offers that dissuade adolescents from engaging in risky behavior. Only a handful of studies have examined the mechanisms by which religion eventuates in lower risk behavior. Two possible mechanism are action-specific beliefs and peer associations. An action-specific belief with regard to religion is a belief that certain behaviors are sinful (e.g., using marijuana is sinful

behavior). Action-specific events represent a link between religious commitment and delinquency. Peer associations refer to associations with people who engage in the risky behavior (e.g., adolescents who smoke marijuana). Presumably, religious adolescents are inclined to adopt action-specific beliefs and the action-specific beliefs deter relevant risky behavior. Likewise, religious adolescents are inclined to avoid peers who smoke marijuana and thus are less inclined to smoke marijuana themselves.

Consistent with this reasoning was a study that assessed religious commitment (a measure of church attendance and religious identification), action-specific beliefs regarding marijuana, peer association with others who use marijuana, and marijuana use (Burkett & Warren, 1987). Results indicated that religious commitment was an important predictor of marijuana use, but the effect of religious commitment was mediated by the action-specific belief that smoking marijuana is a sin and by peer associations. Religious adolescents appear to select peers who are similar in attitudes and behavior regarding the use of marijuana. This peer group provides an “effective moral community which supports beliefs which inhibit the use of marijuana” (p. 127).

A third mechanism that may dissuade religious adolescents from engaging in risk behavior is respect for the juvenile court system. Respect for the juvenile court system reflects how adolescents feel, and how they believe their friends feel toward police, probation officers, juvenile court judges, and the juvenile court. One study examined whether respect for the juvenile court system possibly mediated the relationship between church attendance and 17 types of delinquent behavior (e.g., drinking alcohol, stealing, skipping school; Higgins & Albrecht, 1977). Church attendance was negatively related to delinquent behavior and positively related to self and friends’ respect for the juvenile court system. Further, self and friends’ respect for the juvenile court system was negatively related to self-reported delinquent behavior. Although the

authors did not directly test for mediation, they concluded from the pattern of correlations that respect for the juvenile court system is a possible mediator of the relationship between church attendance and delinquency.

### **Criticisms of Research on Religiosity and Risk Behavior**

Research examining the relationship between religiosity and risk behavior has three limitations that have constrained progress in the area. First, much of the research on religiosity lacks theoretical basis. In many instances it appears that researchers tacked on a measure of religiosity at the end of a survey for exploratory purposes without giving much thought to what they might find or why religiosity would be related to risk behavior. For instance, one review of 65 published studies found that two-thirds were a-theoretical (Tittle & Welch, 1983). A more recent review revealed that over half of the studies published between 1998 and 2003 that examined religion, spirituality, and health behavior lacked theoretical grounding (Rew & Wong, 2006). As noted earlier, some researchers have implied theory by exploring mechanisms (e.g., respect for the juvenile court systems) that may mediate the link between church attendance or other features of religiosity and decreased risk behavior. However, lacking is any overarching theoretical model that integrates previous findings and describes the various paths by which religiosity leads to lower risk behavior. Second, few studies examine the relationship between religiosity and risky behavior longitudinally. Most studies are cross-sectional, examining religiosity and risk behavior simultaneously, making it impossible to examine how religiosity measured at one point in time is related to risk behavior at a later point in time.

Third, there is no consensus in the prior studies of religiosity and risk behavior in how to define religiosity. The lack of clarity in defining religiosity has led to inconsistency in measurement. Some researchers have operationalized religiosity in terms of affiliation with a religious organization (Takyi, 2003). Others have operationalized religiosity in behavioral terms

such as frequency of attending religious services (Lorch & Hughes, 1985; Mullen & Francis, 1995). These two operations are limited in that they define adolescents who do not attend religious services as non-religious even though they may have strong religious sentiments. To address this limitation, other researchers have operationalized religiosity as a self-judgment (e.g., “How religious are you?”).

Complicating matters, many researchers rely on single-item measures, which are problematic because of their questionable reliability. In addition, it is unclear to what extent the various approaches to assessing religiosity (religious affiliation, religious event attendance, frequency of prayer, religious sentiments) are correlated and thus tapping the same underlying construct. It is noteworthy that some research has assessed religiosity with reliable, valid measures (e.g., Cornwall, Albrecht, Cunningham, & Pitcher, 1986). However, the scale items assess Christian religiosity and exclude other religious faiths (Hill & Hood, 1999). Moreover, the researchers have not used their instruments to predict risk behavior.

### **Religiosity-Risk Behavior Model**

To address the limitation that previous research on religiosity lacks theoretical grounding, I developed The Religiosity-Risk Behavior Model (see Figure 1). This model incorporates theoretical links identified by other researchers (e.g., action-specific beliefs, peer associations). In addition, the model proposes that a religious faith offers several features to religious adolescents that diminish risky behavior. The *upstream features* include prescriptions for behavior, access to peer and adult models, decreased risk opportunity, and positive coping strategies. The *downstream features* include cognitions, risk perceptions, and behavioral willingness.

**Upstream features of religiosity.** Several upstream features of religious faiths may contribute to decreased risky behavior. First, all religious faiths have prescriptions for behaviors

and these prescriptions are often at odds with engagement in risky behavior. The prescriptions provide specifications of what behavior is or is not acceptable or moral. The prescriptions may be explicit (e.g., “Thou shall not steal.”) or implied (e.g., “Honor thy father and thy mother” can imply quite a few things about personal behavior). Second, religion provides access to a network of peers and adults who, among other things, model non-risky behavior and care about and monitor the behavior and well being of younger members. This network of peers and adults recognizes the important role identified in prior research on religiosity and risk behavior that peers and others play in the decision to engage in risky behavior (Burkett & Warren, 1987). Third, adolescents engaged religious activities often have less opportunity than secular adolescents to engage in risk behavior. Fourth, certain risk behaviors (e.g., consuming alcohol and using drugs) represent attempts to cope with negative and stressful life events. Religious faiths sometimes provide alternative strategies for coping with life stressors (Shafranske, 1992). These alternative coping strategies may include praying for guidance, asking others to pray for them, and seeking clergy for counsel or assistance.

As evident in Figure 1, three of the upstream features of religious faiths (behavioral prescriptions, decreased opportunity and coping strategies) can have a direct effect on risky behavior. To the extent that adolescents accept a prescription for behavior, they should be less likely to display risky behavior encompassed by the prescription. Likewise, to the extent that adolescents have less opportunity to engage in risky behavior, they are less likely to engage in risky behavior. Finally, the coping strategies provide adolescents with a means of dealing with stressful situations that represent alternatives to engaging in risky behavior.

**Downstream features of religiosity.** Several of the upstream features of religious faiths affect engagement in risk behavior indirectly through intermediate routes. First, a consequence of

decreased opportunity is the sustained perception that engaging in risk behavior inevitably leads to negative outcomes. Specifically, people base risk judgments in part on their experience with the behavior (driving while drunk) and their experience with the outcome (getting in an automobile accident). Typically there is not a one-to-one correspondence between the risk behavior and the outcome. In most instances, people who drive drunk do not get in automobile accidents. The experience of the behavior without the negative outcome serves to undermine the perception that the outcome is an inevitable consequence of the behavior. The result is that people who engage in risky behavior without negative consequences come to perceive the behavior as less risky, whereas people who do not engage in the risky behavior continue to perceive the behavior as risky. Consistent with this reasoning is the finding that adolescents with no experience with a risky behavior (e.g., no experience drinking alcohol) perceived their risk of experiencing a negative consequence following the behavior (e.g., getting sick from drinking several beers) as greater than did adolescents who had experience with the behavior but no experience with the negative consequences (Halpern-Felsher et al, 2001). The (sustained) perception that risky behavior leads to negative outcomes makes the behaviorally inexperienced adolescents unwilling to engage in risky behavior.

Peer/adult models and prescriptions for behavior can also indirectly influence risky behavior. Peer/adult models can provide information about the prescriptions for behavior. More importantly, both of these upstream features can influence risk related cognitions by affecting how adolescents think about risk behavior. These risk cognitions include attitudes, action-specific beliefs, subjective norms and risk prototypes. *Attitudes* represent people's likes or dislikes for an attitude object. Peer/adult models as well as the prescriptions for behaviors can prompt adolescents to form negative attitudes about risk behaviors. As noted earlier, *Action*

*Specific Beliefs* represent beliefs about behaviors (e.g., “smoking marijuana is sinful”; Burkett & Warren, 1987), and adolescents who endorse negative action-specific belief about negative or risky behavior should be less likely to engage in the corresponding risky behavior. Importantly, action specific beliefs are distinct from prescriptions for behaviors. Prescriptions for behavior represent the extent to which participants have been taught that a particular behavior is right or wrong. As such, prescriptions represent *do*’s and *don*’ts. Action specific beliefs represent thoughts about the acceptability particular actions. In a sense, they represent the extent to which participants endorse the prescriptions.

Regarding *subjective norms*, according to the theory of reasoned action, people consider whether important others will approve or disapprove of their behavior when forming behavioral intentions to engage in behavior (Ajzen & Fishbein, 1980). The prescriptions for behaviors typically involve norms for acceptable behavior, and peers and adults both model and enforce compliance with the norms. To the extent that the norms against risky behavior are clear and accepted by the adolescents or enforced by peers and adults, then they should eventuate in less willingness to engage in risky behavior.

Regarding *prototypes*, people often have an image or prototype of the typical person who engages in a risky behavior. For example, most adolescents have a prototype of the typical person who uses drugs. Further, adolescents understand that if they engage in risky behavior, they may be seen as having characteristics associated with the risk prototype (Gibbons, Gerrard, Blanton, & Russell, 1998). To the extent that adolescents perceive a prototype that engages in a risky behavior as undesirable, they will be disinclined to engage in the risky behavior.

Both risk cognitions and risk perceptions influence *behavioral willingness*. Adolescents often do not intend to engage in risky behavior, but find themselves in situations where the

opportunity to engage in risky behavior is present. Adolescents differ in whether they are willing to engage in risky behavior when faced with the opportunity (Gibbons et al., 1998). Adolescents display greater willingness to engage in risky behavior when they perceive that norms support engaging in the behavior (Gibbons, Helweg-Larsen, & Gerrard, 1995) they have positive attitudes toward the behavior (Gibbons, Gerrard, Ouelette, & Burzette, 1998), and their prototype of who engages in the behavior is positive (Gibbons et al., 1998). I propose that religious adolescents will display lower behavioral willingness because they are more likely to perceive that important others do not engage in, or approve of engaging in risky behaviors. I further propose that religious adolescents will hold more negative attitudes about engaging in risky behavior and more negative perceptions of the prototypical person who engages in risky behavior.

Finally, I anticipate that the Religiosity-Risk Behavior Model will predict a variety of risky behaviors including drinking alcohol, smoking tobacco, using illicit drugs, and engaging in sex (and engaging in sex without a condom).

### **Study Overview**

Given past research, I expect that greater religiosity will correspond to lower risk behavior. Specifically, greater religiosity will correspond to lower levels drug use among our sample of late adolescents. For the current study, only illicit drug use was examined as an outcome variable. Although I anticipate that the model will predicts other risk behaviors described equally well, I specifically focused on illicit drug use.

### **Hypotheses**

The primary aim is to examine *why* religious adolescents are less inclined than non-religious adolescents to engage in illicit drug use. This primary aim will be accomplished by examining the various hypothesized links outlined in the model. Although the hypotheses are

phrased as though religiosity will be treated as a dichotomous predictor, all statistical analyses will treat religiosity as a continuous predictor. I predict the following.

1. Religious adolescents will be more likely than non-religious adolescents to report having prescriptions against using illicit drugs. I further predict that the prescriptions regarding illicit drug use will partially mediate the relationship between religiosity and drug.
2. Religious adolescents will be more likely than non-religious adolescents to report having positive adults/peer models (i.e., adults and peers who care about the participants, and discourage or condemn drug use). I further predict that reports of peer/adult models will partially mediate the relationship between religiosity and the prescriptions regarding drug use.
3. Prescriptions regarding illicit drug use and the availability of peer/adult models will be linked to participants' risk cognitions (attitudes, norms, beliefs, and prototypes). Specifically, having prescriptions against drug use and positive peer/adult models will correspond with more negative attitudes toward using drugs, perceiving drug use as non-normative, holding more negative beliefs about using drugs, and more negative prototypes about the type of people who use drugs.
4. Religious adolescents, compared with non-religious adolescents, will have less favorable cognitions regarding drug use. Moreover, prescriptions against drug use and the availability of peer/adult models will mediate the relationship between religiosity and the risk cognitions.
5. Religious adolescents will report having less opportunity to use drugs than will non-religious adolescents. The less opportunity will in turn correspond with greater risk attached to using drugs. Specifically, decreased opportunity will correspond with the belief that using drugs will result in addiction and punishment by law enforcement. Lower reported opportunity to use drugs will correspond to lower drug use.
6. Negative cognitions about using drugs and a strong perception that using drugs will produce negative consequences will correspond to a lower willingness to use drugs. The lower willingness to use drugs will correspond to less drug use. Lower willingness to use drugs will mediate the relationship between the cognitions about using drugs and the perceived risk of using drugs.
7. Religious adolescents, compared with non-religious adolescents, will have more religious coping strategies for dealing with stressful situations. The availability of religious coping strategies will be associated with a lower likelihood of turning to risky behavior such as using illicit drugs to deal with stressful situations. As a result, the availability of religious coping strategies will partially mediate the relationship between religiosity and illicit drug use.

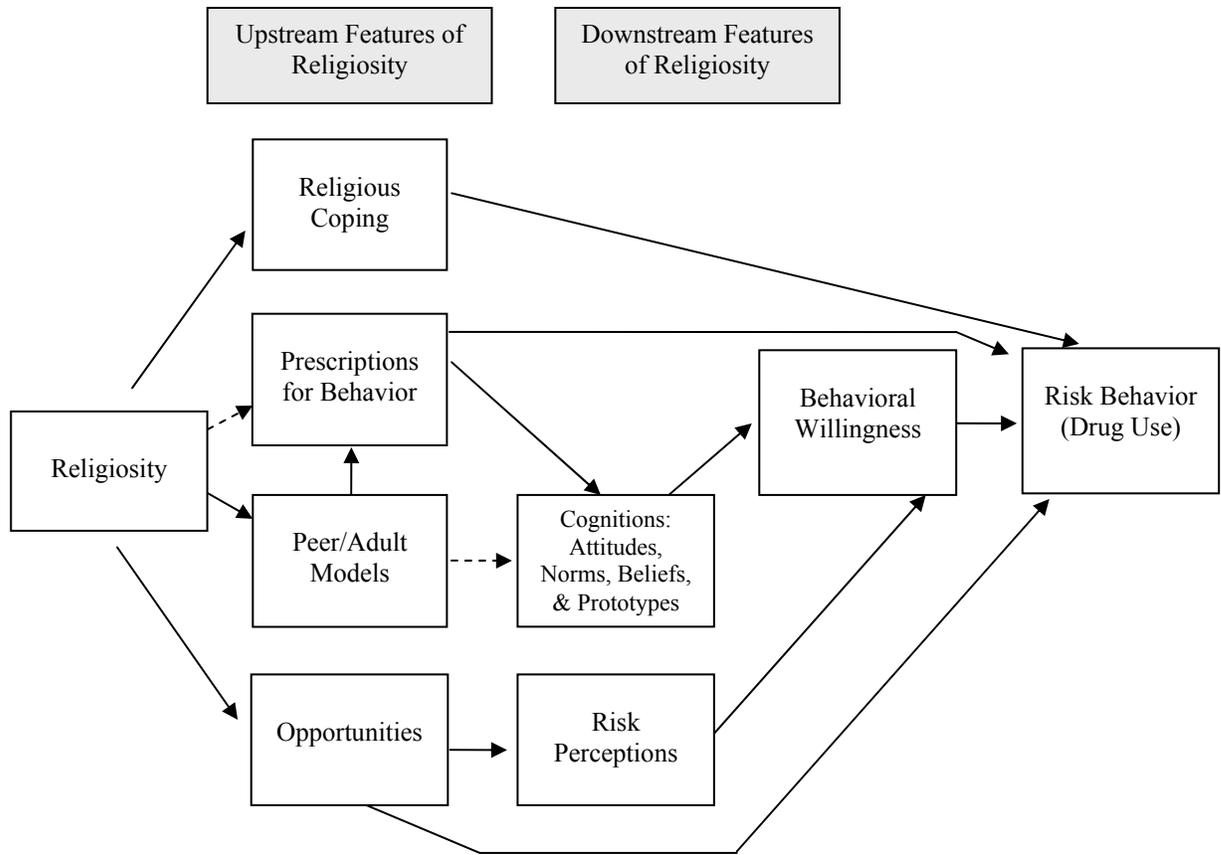


Figure 1-1. Religiosity and risk behavior model

## CHAPTER 2 METHOD

### **Participants**

Participants were undergraduate students (190 male, 84 female) from psychology classes who completed an online survey of religiosity and risky behavior as part of a course obligation. Participants were predominantly Caucasian (Caucasian = 135, African American = 49, Asian American = 34, Hispanic = 43, Other = 13), between the ages of 18 and 21 (18 = 65, 19 = 90, 20 = 52, 21 = 41, 22 and over = 25, not reported = 1), and Protestant (Protestant = 110, Catholic = 68, Agnostic = 26, Atheist = 10, Hindu = 6, Islamic = 6, Jewish = 16, Other = 13, not reported = 19).

### **Procedure**

Participants who agreed to participate were directed to a website that contains all study materials. Once they consented to participate, participants were transferred to a webpage that contained the survey items. On completing the survey participants read a debriefing statement that described the purpose of the study and then were thank for their time.

### **Materials**

**Demographic items.** After completing the consent form, participants responded to several demographic items that assessed their age, sex (see Appendix B).

**Religious Commitment Inventory (RCI-10).** The RCI-10 is a ten-item measure of “the degree to which a person adheres to his or her religious values, beliefs, and practices and uses them in daily living” (Worthington, et al., 2003, p.85). Example items include, “I often read books and magazines about my faith.” and “My religious beliefs lie behind my whole approach to life.” Participants will rate items on a scale from 1 = *not at all true of me* to 5 = *totally true of me*. The RCI has acceptable psychometric characteristics. For example, the scale has high

internal consistency (Cronbach's alphas above .85), test-retest reliability over five months ( $r = .84$ ), and clear construct validity (Worthington, et al., 2003). (Appendix C)

**Prescriptions for behavior.** Prescriptions provide guidelines that determine what behaviors are or are not acceptable and moral. To measure this construct, participants completed an item that assessed the extent to which they have been exposed to specific prescriptions against illicit drug use. The item read as follows, "I have been taught that using drugs is wrong." (1 = *strongly disagree* to 7 = *strongly agree*).

**Peer/adults models.** Religion provides access to peers and adults who model non-risky behavior and care about and monitor the behavior and well being of religious adolescents. We used items such as, "I know adults who care about me", "I have peers who care about me", and "The adults I know discourage or disapprove of risky behavior". For all items, participants responded with 1 = *strongly disagree* to 7 = *strongly agree*. (Appendix D)

**Opportunity.** Adolescents who are active in their religious institution may have less opportunity than secular adolescents to engage in risk behavior. Participants perception of their opportunity to use illicit drugs was measured using the following item, "It would be easy for me to get drugs" Participants responded with 1 = *strongly disagree* to 7 = *strongly agree*.

**Religious coping strategies.** We used five items from the Religious Coping Activities Scale (Pargament et al., 1990). Participants were directed to think about a past stressful event and then to indicate, for example whether they, "Found the lesson from God in the event", and "Sought support from clergy." Participants responded with 1 = *not at all* to 7 = *a great deal*. The subscales from which these items are drawn have shown adequate reliability ( $\alpha = .78-.92$ ; Pargament, et al., 1990). (Appendix E)

**Attitudes.** Attitudes represent people's likes or dislikes for an attitude object. Participants rated their attitudes about drug use by completing the following item, "Please rate how you feel about you using drugs". Items were rated on a scale from 1 = *Very Negative* to 7 = *Very Positive*.

**Subjective norms.** To measure subjective norms, I used items adapted from previous research (Gibbons, Gerrard, Blanton, & Russell, 1998) in which participant's estimate of how often their friends and peers engage in various risk behaviors and how their friends and parents would react if the participant engaged in the risk behaviors. An example item is as follows, "How many *people* your age do drugs or have used drugs?" (Appendix F)

**Action-specific beliefs.** Action-Specific Beliefs represent beliefs about behaviors and the acceptability of those behaviors. I used an item adapted from previous research (Burkett & Warren, 1987; Burkett & White, 1974). Participants rated the following item, "I believe using drugs is wrong" on a scale from 1 = *strongly disagree* to 7 = *strongly agree*.

**Prototypes.** A prototype is a mental representation of the typical person who engages in a behavior. Participants read a description that defines the term prototype (Gibbons, Gerrard, & Boney McCoy, 1995). Then they rated prototypes who use illicit drugs using the following adjectives: smart, confused, popular, immature, "cool" [sophisticated], self-confident, independent, careless, unattractive, dull [boring], considerate and self-centered (Gibbons, Gerrard, Blanton, & Russell, 1998). Participants responded to the adjectives with 1 = *not at all* to 7 = *very*. Factor analysis from previous research indicates that the twelve adjectives load on three correlated factors labeled mature, self-assured, and attractive (Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Gibbons et al., 1998). (Appendix G)

**Risk perceptions.** I used items modeled after those used in previous research exploring the extent to which people perceive negative outcomes an inevitable consequence of engaging in

a given risky behavior (Halpern-Felsher et al, 2001). For example, one of the drug use risk perception items asked participants to imagine they are at a party where they are offered the opportunity to try an illicit drug. They then estimated (from 0% to 100%) the likelihood that they would overdose on the drug. See Appendix H.

**Behavioral willingness.** We assessed behavioral willingness using items adapted from prior research (Gibbons et al., 1998). Participants completed the following item, “Suppose you were with some friends at a party and one of them offered the opportunity to try an illegal drug. How likely is it that you would do each of the following: (1) Take it and try it, (2) Tell them no thanks, and (3) Leave the situation.” Participants responded to each choice using the following scale: 1 = *not at all likely* to 7 = *very likely*. We reverse scored responses to the second and third options before summing the three responses ( $\alpha = .80$ ; Gibbons et al., 1998).

**Risk behavior.** Participants reported the frequency with which they have used an illegal drug in their lifetime ( $0 = none, 1 = 1\ time, 2 = 2-5\ times, 3 = 6-10\ times, 4 = more\ than\ ten\ times$ ) and during the past month ( $1 = None\ of\ the\ time, 2 = once\ or\ twice, 3 = a\ few\ times, 4 = fairly\ often, 5 = every/almost\ every\ day$ ). Due to the high correlation between these two items (i.e.,  $r = .57, p < .01$ ), the hypothesized model was only tested with lifetime frequency of drug use as the outcome variable.

## CHAPTER 3 RESULTS

The study data were analyzed using the MPLUS statistical package. Means, standard deviations, and correlation coefficients for the model variables are presented in Tables 1 and 2. Table 3 presents the frequencies for both the lifetime drug use and drug use in the past month. The data are positively skewed, with most participants reporting no drug use in the past month nor during their lifetime. Because both outcome measures were highly correlated ( $r = .57, p < .001$ ), the model was only tested with the lifetime drug use outcome variable.

The correlations between variables were consistent with previous findings. Religiosity was correlated with illicit drug use (Donahue, 1995; Wallace & Forman, 1998), as were most of the proximal and distal features of religiosity (Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004). Because the predicted relationships between variables were largely supported by the correlation matrix, the data were appropriate for structural equation modeling.

All models tested were observed variable path models. Two model constructs, Cognitions and Peer/Adult Models, had multiple indicators. For Peer/Adult Models the indicators were a composite of four items that measured adult models ( $\alpha = .74$ ) and a composite of the three items that measured exposure to peer models ( $\alpha = .55$ ). For Cognitions, the indicators were the attitude item, action-specific item, four items measuring social norms, and the prototype items. The indicators were subjected to an explanatory factor analysis (EFA) to determine if it was appropriate to combine each set of indicators to form the two model constructs. The results of the EFAs supported combining the indicators for Cognitions and the indicators for Peer/Adult Models. For both the Cognitions EFA and the Peer/Adult Models EFA, the analyses suggested a one factor models were the best solution and indicators had factor loadings above .40.

Model 1 tested the hypothesized observed variable path model (Figure 2). Goodness of fit indices for Model 1 fell below criteria that indicate good model fit (Table 4). Thus, the modification indices were examined to determine modifications to the model that would increase model fit. Decisions to modify the model were based on modification indices as well as theoretical concerns.

Model 2 tested the hypothesized observed variable path model with the addition of a path from opportunities to cognitions. The modification indices suggested that the inclusion of this path would increase model fit. More importantly, it made conceptual sense to include this path. The perceived ease/difficulty of obtaining drugs would likely influence cognitions about drug use. The direction of the path coefficient indicated that greater perceived opportunity leads to more favorable cognitions about drug use. Perhaps people believe that if drugs are easy to obtain, they must not be that bad. After all, if they were bad, then authorities would take more action to curb their availability. The inclusion of the path from opportunities to cognitions improved model fit (Table 4), but further modifications were needed to meet goodness of fit guidelines.

Model 3 tested the same paths represented in Model 2 with the addition of a path from Peer/Adult Models to Behavioral Willingness. Again, this path was added based on the modification indices and theoretical considerations. Recall that Peer/Adult Models refers to the extent to which people have adults and peers that who they can look up to, aspire to be like, and who discourage engagement in risky behavior. For some people, having adults and peers that discourage risky behavior may be all that is needed discourage willingness to engage in risky behavior, without any cognitive elaboration. The addition of the path from Peer/Adult Models to Behavioral Willingness improved model fit to minimum standards (Table 4), but one additional modification to the model was made to achieve good model fit.

The final model, Model 4, tested the same paths represented in Model 3 with the addition of a path from Cognitions to Risk Perceptions (Figure 3). To the extent that people hold negative cognitions regarding drug use (e.g., they have a negative attitude, perceive few social norms that support drug usage, etc.), they are likely to perceive greater risk of experiencing negative outcomes (e.g., getting addicted to drugs, suffering negative health outcomes, getting arrested for drug use) related to drug use. Good model fit was achieved by adding this path from Cognitions for Risk Perceptions (Table 4).

Table 3-1. Correlations for model constructs.

Construct	1	2	3	4	5	6	7	8
1. Religiosity								
2. Religious Coping	.84**							
3. Prescriptions for Behavior	.10	.08						
4. Peer/Adult Models	.23**	.13*	.35**					
5. Opportunities	-.12*	-.13*	-.08	.07				
6. Cognitions	-.16**	-.09	-.38**	-.19**	.44**			
7. Risk Perceptions	-.01	.05	.13*	-.04	-.19**	-.32**		
8. Behavioral Willingness	-.21**	-.13*	-.34**	-.29**	.36**	.65**	-.29**	
9. Drug Use	-.23**	-.20**	-.29**	-.14*	.39**	.52**	-.30**	.55**

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

Table 3-2. Means and standard deviations for model constructs.

Construct	Mean	SD
Religiosity	22.98	10.97
Religious Coping	14.25	8.13
Prescriptions for Behavior	6.21	1.25
Peer/Adult Models	39.93	6.40
Opportunities	4.19	1.96
Cognitions	51.82	16.54
Risk Perceptions	83.47	70.32
Behavioral Willingness	6.33	3.92
Drug Use	.96	1.53

Table 3-3. Frequencies for lifetime illegal drug use and drug use in the past month.

Items	0 = none	1 = 1 time	2 = 2-5 times	3 = 6-10 times	4 = more than 10 times
Please indicate the number of times you have used an illegal drug.	175	11	22	7	41
	0 = none of the time	1 = once or twice	2 = a few times	3 = fairly often	4 = everyday or almost everyday
During the past month, how often have you used illegal drugs?	243	16	6	4	5

NOTE: 18 PARTICIPANTS DID NOT ANSWER THE LIFETIME DRUG USE ITEM.

Table 3-4. Summary statistics of the religiosity and risk behavior structural equation models

Model	df	X <sup>2</sup>	RMSEA (90% CI)	p-value for close fit RMSEA	CFI	SRMR	TLI
1	22	134.43*	.14 (.12 - .16)	<.01	.85	.11	.76
2	21	75.69*	.10 (.08 - .12)	<.01	.92	.07	.88
3	20	62.24*	.09 (.06 - .11)	<.01	.95	.06	.90
4	19	43.65*	.07 (.04 - .09)	.11	.97	.04	.94

N = 272. RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual; TLI = Tucker-Lewis Index.

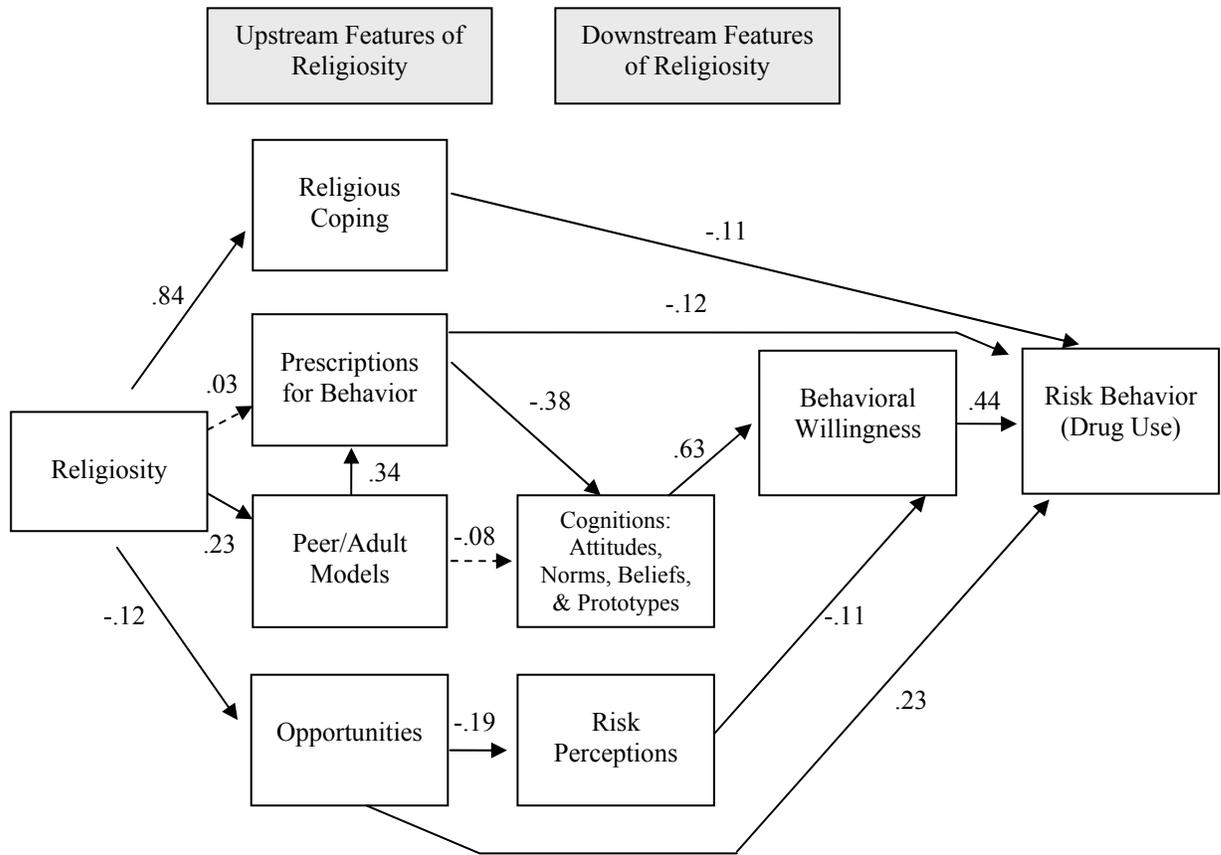


Figure 3-1. Model 1: The hypothesized model. Significant paths appear as solid lines, non-significant paths are dashed lines.

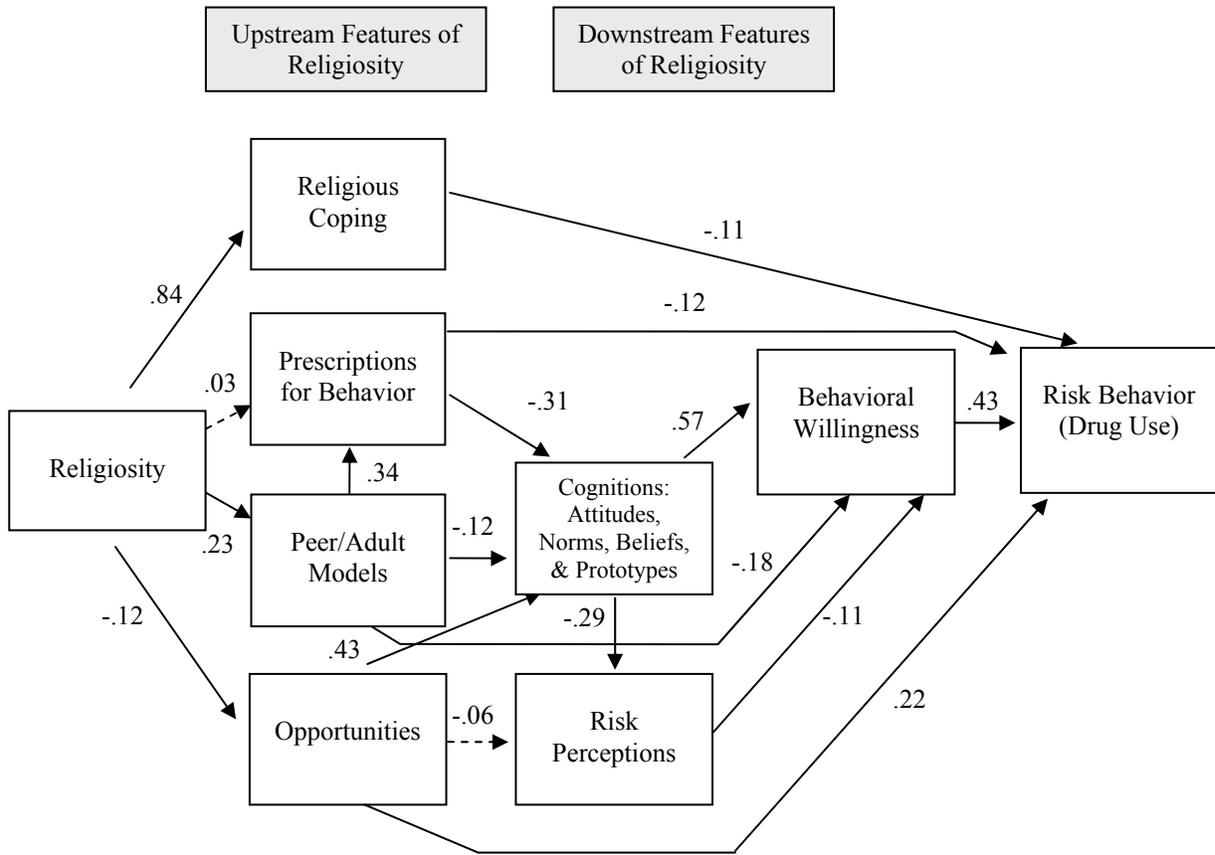


Figure 3-2. Model 4: The final model. Significant paths appear as solid lines, non-significant paths are dashed lines.

## CHAPTER 4 DISCUSSION

This research was designed to provide an initial test of a model of religiosity and risk behavior. We designed the model to predict a variety of risk behaviors including drinking alcohol, having unprotected sex, and smoking cigarettes. The current investigation examined the relationships between religiosity, the upstream and downstream features of religiosity, and illicit drug use. Consistent with our predictions, greater religiosity as measured by the Religious Commitment Inventory (RCI) corresponded to less illicit drug use. Also consistent with our predictions, most of the paths through which we hypothesized religiosity would relate to risk behavior were significant. However, some modifications to the model were necessary to achieve good model fit.

I made three modifications to the model based on goodness-of-fit indices and theoretical considerations. The final model included the proposed model paths with the addition of three new paths: 1) Opportunities to Cognitions; 2) Peer/Adult Models to Behavioral Willingness; and 3) Cognitions to Risk Perceptions. Although these paths were not predicted in the hypothesized model, they are justifiable both on theoretical and empirical grounds. Future tests of the model with different risk events will help us to determine whether these additional paths should become a permanent fixture of the model.

Analysis of the hypothesized model revealed that all but two of the predicted paths were significant. The first non-significant path was the path from religiosity to prescriptions against drug use. We can think of two reasons for the null effect. First, people likely receive the messages condemning the use of illegal drug from other sources such as the media, friends, parents, and teachers, and thus there may be no variance unique to religiosity. It is noteworthy that the mean for the prescription item ( $M = 6.21$  on a seven point scale) suggests that most

participants reported that they had heard the message that using illicit drugs is wrong. Of the 270 total participants, 79% reported high agreement with the item (i.e., responded with a 6 or 7) “I have been taught that using drugs is wrong”, 20% reported moderate agreement with the item (i.e., responded with 3, 4, or 5), and only 1% reported low agreement with the item (i.e., responded with a 1 or 2). These frequencies suggest that there is some variation in exposure to, or perhaps endorsement of, this message among college students, but it is mostly due to outliers in the data.

Second, the items may have been poorly worded and thus did not capture the construct of behavioral prescriptions. We created and tested the prescription item for the first time in this study. Perhaps participants don’t regard the transmittal of information in a religious context or from adults in their religious community as teaching. Rather, they may have a limited view of teaching as something that occurs only at school. In future studies we will refine the measurement of prescriptions for behavior construct by including items that assess the different sources of exposure to prescriptions. It is quite possible that young people are exposed to competing prescriptions regarding risk behavior. For example, music videos may endorse drug use, while parents and religious leaders discourage it.

The second non-significant path in the hypothesized model was the path from Peer/Adult Models to Cognitions. Our data suggest that exposure to peers and adults who can serve as models for non-risky behavior and discourage risky behavior was not related to cognitions regarding drug use. However, this hypothesized path becomes significant in the final model. The switch from a nonsignificant path to a significant path following the addition of three new paths to the final model (i.e., the paths from peer/adult models to behavioral willingness, cognitions to

risk perceptions, and opportunities to cognitions) suggests a suppressor effect. Say in one sentence what this means (i.e., what is being suppressed).

Several additional findings deserve mention. First, we observed a high correlation between religiosity and our measure of religious coping ( $r = .84$ ) suggesting that the items represented by the two measures were tapping the same underlying construct. We are currently looking for a new measure of coping to address this problem. Second, we observed a high correlation between cognitions and behavioral willingness ( $r = .65$ ). This result is not surprising. Previous researchers have found strong relationships between the cognitions constructs and behavioral willingness (Gerrard, Gibbons, Reis-Bergan, Trudeau, Vande Lune, & Buunk, 2002; Gibbons et al., 1998). In addition, the measurement of these constructs was adapted from measures used in previous studies. Thus, the items measuring the cognitions constructs and behavioral willingness have undergone multiple modifications and are more precise measurements of the constructs.

There are additional limitations to the current investigation. First, participants in the current study were college students, primarily between the ages of 18 and 21. These late adolescents/emerging adults likely differ from younger adolescents (e.g., they have more opportunity to engage in risk behavior due to less parental monitoring). Second, the current study only examined drug and not other risky behaviors. It is unknown how the results will look when other risk events (e.g., alcohol use, unprotected sex) are examined. For example, it may be that opportunity is more important in predicting drug use than in predicting cigarette smoking because illicit drugs are more difficult to obtain. Third, all data are self-reports. Perhaps participants are not accurately reporting their behavior and perceptions. Participants may not accurately report their drug use because of fear of the consequences even though we assured

participants repeated that their responses would remain confidential. Also, participants may misreport their behavior and perceptions because they simply do not remember that information accurately.

Fourth, the cross-sectional nature of the data limits our ability to draw conclusions about the ordering of events in the model. In addition, the nature of the dependent measure limits the ability to conclude that religiosity and the upstream and downstream features of religiosity precede drug use in time. The dependent measure for the current study was lifetime drug use. The drug use participants reported could have occurred recently or when they were younger (e.g., in high school). However, participants reported their current religiosity and current perceptions of the upstream and downstream features of religiosity (e.g., attitudes, opportunities). Thus, the behavior reported in the outcome measure could have occurred before other model components. It is possible that drug use influenced their perceptions of religion and other model constructs rather than religiosity and its features predicted their drug use.

Our findings, and the limitations we addressed, suggest important directions for future research. First, we are interested in testing the model with younger adolescents. As stated previously, younger adolescents may differ in significant ways from young college students and these differences may produce differences in the predictive capacity of the model. Second, we plan to multiple measurements of model constructs so that we can examine the effects of religiosity and its upstream and downstream features on risk behavior over time. Next, we are interested in examining whether our model predicts for other risk events. Finally, we plan to increase the number of items that measure prescriptions to assess the source of prescriptions against risk behavior (e.g., media, parents).

For years researchers have found that religious adolescents are less likely to engage in risk behavior (e.g., Amey, Albrecht, & Miller, 1996; Dunn, 2005; Nonnemaker et al., 2003; Steinman & Zimmerman, 2004; Wallace & Forman, 1998), but few studies have examined why. The theoretical model we present is an important first step in learning why religious adolescents are disinclined to engage in risky behavior. Our data supported the hypothesized theoretical model with minor alterations. However, some theorized paths in the model are more predictive (i.e., have larger indirect effects) than are other paths. The Religiosity and Risk Behavior Model does not specify a direct path between religiosity and drug use. Rather, it specifies links between intervening upstream and downstream features of religiosity that account for the relationship between religion and drug use. These indirect effects are calculated by multiplying the coefficients along each pathway linking religiosity to drug use. For example, the size of the indirect effect associated with the link of religiosity to religious coping to drug use was .25. While this was the largest indirect path, the problematic measurement of religious coping limits our ability to draw conclusions from this effect.

Two model paths stand out as most predictive of drug use (excluding those paths that include variables with measurement problems). First, the path from religiosity to opportunities to drug use suggests that the lower illicit drug use among religious adolescents is partially explained by their having less opportunity to use drugs. The implication is that drug use can be among adolescents by restricting the access or to use drugs. Second, the path from religiosity to peer/adult models to cognitions to behavioral willingness to drug use suggests that religious adolescents report having more peer and adult models that they can look up to and that discourage the use of drug use. In addition, exposure to these models influences cognitions about drug use (e.g., leads to more negative attitudes, more negative evaluation of the type of person

who uses drugs) that then leads to a decreased willingness to use drugs and less actual drug use. The implication is that providing youth with peer/adult models who discourage drug use can foster negative toward illicit drugs. Consistent with this notion is evidence that adolescents who regularly interact with a positive model are 46% less likely to begin using drugs, compared with adolescents who are on a wait list for the mentoring program (Tierney, Grossman, Resch, 1995).

In summary, the current study is the first test of the Religiosity and Risk Behavior model. Although the study had some limitations, overall the data support the hypothesized model. Religious adolescents were less likely to report using illicit drugs and their lower drug use appears to result primarily from greater exposure to peer/adult models who discourage drug use and less opportunity to use illicit drugs.

APPENDIX A  
CONSENT FORM

I will answer several questionnaires in this study. These questionnaires will ask about my feelings towards different behaviors. I will receive 2 experimental credits for completing the questionnaires today.

Depending on the speed of your computer connection and the speed at which you answer questions, your participation today may take up to one hour.

**Time Required:** 1 hour

**Risks and Benefits:** I will benefit by learning about research. There are no risks.

**Compensation:** I will receive 2 credits for participation.

**Confidentiality:** My responses will be confidential to the extent provided by the law. I will be assigned a code number, and my responses will be stored in a computer according to the code number and not by my name. As such, my name will not be associated with my responses and will not be used in any report. Moreover, all data will be analyzed by group averages and not by individual responses.

**Voluntary Participation & Right to Withdraw:** I understand that my participation in this study is voluntary. There is no penalty for not participating. I have the right to withdraw from the study at any time without consequence.

**Whom to Contact if You have Questions about the Study:**

James A. Shepperd, Faculty Advisor, Dept. of Psychology, University of Florida, 392-0601 x 248.

Wendi Malone, Principal Investigator, Dept. of Psychology, University of Florida, 392-0601 x 261.

**Whom to Contact about Your Rights as a Research Participant in the Study:**

UFIRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; ph. 392-0433.

**By signing below I acknowledge that I have read the above information and agree to participate in this study.**

\_\_\_\_\_  
Signature of Research Participant      Date

APPENDIX B  
DEMOGRAPHIC QUESTIONNAIRE

Please answer the following demographic questions.

1. Age: \_\_\_\_\_
2. Sex: \_\_\_\_\_ Female    \_\_\_\_\_ Male
3. Ethnicity:
  - a. African American
  - b. Arab American
  - c. Asian American
  - d. Caucasian
  - e. Hispanic
  - f. Native American
  - g. Other: \_\_\_\_\_ (please specify)
4. Class rank:
  - a. Freshman
  - b. Sophomore
  - c. Junior
  - d. Senior
  - e. Grad Student
  - f. Other: \_\_\_\_\_ (please specify)
5. What is your religious affiliation?
  - a. Agnostic
  - b. Atheist
  - c. Christian
  - d. Islamic
  - e. Jewish
  - f. Other. Please specify \_\_\_\_\_
6. How often do you attend religious services (on average over the past year)?
  - a. Once a week or more
  - b. Two or three times a month
  - c. Once a month
  - d. Only on important holidays
  - e. Never
7. On average, how many hours per month do you spend participating in activities (for example, Bible studies) associated with your religious institution?
  - a. More than one hour per week
  - b. One hour per week
  - c. One to three hours per month
  - d. Less than one hour per month

- e. None
8. On average, how often did you attend religious service throughout your childhood?
- a. Once a week or more
  - b. Two or three times a month
  - c. Once a month
  - d. Only on important holidays
  - e. Never

APPENDIX C  
RELIGIOUS COMMITMENT INVENTORY (RCI-10)

**Instructions:** Read each of the following statements. Using the drop down boxes, indicate the extent to which each statement is true of you.

<b>Not at all</b>	<b>Somewhat</b>	<b>Moderately</b>	<b>Mostly</b>	<b>Totally</b>
true of me	true of me	true of me	true of me	true of me
1	2	3	4	5

1. I often read books and magazines about my faith.
2. I make financial contributions to my religious organization.
3. I spend time trying to grow in understanding of my faith.
4. Religion is especially important to me because it answers many questions about the meaning of life.
5. My religious beliefs lie behind my whole approach to life.
6. I enjoy spending time with others of my religious affiliation.
7. Religious beliefs influence all my dealings in life.
8. It is important to me to spend periods of time in private religious thought and reflection.
9. I enjoy working in the activities of my religious affiliation.
10. I keep well informed about my local religious group and have some influence in its decisions.

APPENDIX D  
PEER/ADULT MODELS

Please rate the following items on a scale from 1 = *strongly disagree* to 7 = *strongly agree*.

1. I know adults who care about me.
2. I have peers who care about me.
3. The adults I know discourage or disapprove of risky behavior.
4. I feel I have many adults that I look up to.
5. The peers I spend time with discourage or disapprove of risky behavior.
6. I know many adults that I admire and aspire to be like.
7. I know many peers that I admire and aspire to be like.

APPENDIX E  
RELIGIOUS COPING STRATEGIES

Please think about a stressful event in your past. Please read the statements listed below and for each statement indicate to what extent each of the following was involved in your coping with the event. Please answer the following items on a scale from 1 = *not at all* to 7 = *a great deal*.

1. Found the lesson from God in the event.
2. Sought support from clergy.
3. Attended religious services or participated in religious rituals.
4. Participated in religious groups (e.g., support groups, prayer groups, Bible studies).
5. Sought support from other members of the religious institution.

APPENDIX F  
SUBJECTIVE NORMS

**Rate the following items on a scale from 1 = *none* to 7 = *almost all*.**

1. How many *people* your age do drugs or have used drugs?
2. How many of your *friends* do drugs or have used drugs?

**Rate the following items on a scale from 1 = *have a strong negative reaction and tell you to stop* to 7 = *encourage you to continue*.**

3. How do you think *your friends* would respond if they thought you did drugs?
4. How do you think your *parents* would respond if they thought you did drugs?

## APPENDIX G PROTOTYPES

### **Prototypes**

The questions below concern your images of people. What we are interested in here are your ideas about typical members of different groups. For example, we all have ideas about what typical movie stars are like or what the typical grandmother is like. When asked, we could describe one of these images—we might say we think the typical movie star is pretty and rich, or that the typical grandmother is sweet and frail. We are not saying that all movie stars or all grandmothers are exactly alike, but rather that many of them share certain characteristics.

Please indicate the extent to which each of the following adjectives describes the type of person (your age) who uses drugs. Please rate adjectives on a scale from 1 = *not at all* to 7 = *very*.

smart, confused, popular, immature, "cool" (sophisticated), self-confident, independent, careless, unattractive, dull (boring), considerate and self-centered

## APPENDIX H RISK PERCEPTIONS

In this section we ask you to imagine YOURSELF in situations. You personally might never be in these situations. But try to estimate the chance that these things would happen to YOU if you were in these situations, by using any number from 0% to 100%.

*Imagine that you are at a party and someone offers you an illegal drug. You decide to try it.*

What is the chance that you will overdose on the drug?

What is the chance that you will get arrested for using the drug?

What is the chance that you will get addicted to the drug?

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