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Teenage Religiosity and Changes in Marijuana Use During the Transition to Adulthood

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ABSTRACT

Few studies have examined the effect of religiosity on the initiation of, persistence in, and desistence from delinquency. Yet religiosity may differentially affect these dimensions of delinquency in the early life course. Using data from the National Longitudinal Study of Adolescent Health (Add Health), we study the relationship between religiosity and patterns of marijuana use. The results suggest that the primary effect of religiosity on marijuana use is to prevent its initiation in the first place. Religious youths are significantly more likely never to use marijuana than to initiate marijuana use or become persistent marijuana users. Although religious youths are less likely ever to use marijuana, adolescent religiosity does not significantly predict desistance from marijuana use. Furthermore, adolescent religiosity does not differentiate between never using and desistance, intermittent use and desistance, or persistent use and desistance.

Criminal and delinquent careers have particular dynamics: initiation, persistence, and desistance (Blumstein et al. 1986; Thornberry and Krohn 2005). Of the dynamics of delinquency and crime, desistance is particularly understudied (Bushway, Thornberry, and Krohn 2003; Giordano et al. 2008), and even fewer studies have examined religion's role in desistance from delinquency, as compared to initiation or abstinence, or in intermittent delinquency. However, many studies support the notion that religiosity should promote abstinence from delinquent acts (Baier and Wright 2001; Johnson et al. 2000), and there are reasons to expect that religiosity could foster desistance from crime and delinquency (Chu 2007; Giordano et al. 2008; Schroeder and Frana 2009). That is, once individuals become involved in deviant behavior, religion might help to steer them away from such behavior and thus from longer criminal careers (Giordano et al. 2008; Johnson 2009).

Alternative expectations are also plausible. Once an individual becomes involved in delinquency, religiosity might not be able to override other influences that foster persistence in delinquent behavior (Giordano et al. 2008). Furthermore, if offending dynamics have distinct causes (Blumstein et al. 1986), then perhaps religiosity affects some dimensions of delinquency (say, initiation but not desistence or vice versa) but not others. These research questions have not often been examined, and they continue to remain understudied.

To address these issues, we explore the effect of religious involvement during adolescence on changes in marijuana use between adolescence and young adulthood. To what extent does adolescent religiosity help to explain the initiation of marijuana use during adolescence and young adulthood, as compared to its persistence, intermittent use, or desistance? We answer this question using Waves I to III of the National Longitudinal Study of Adolescent Health (Add Health), which contain suitable measures of religiosity, marijuana use, and other important predictors.

RELIGION AND CHANGES IN DELINQUENCY
Considerable evidence now exists that religious involvement exerts meaningful direct and indirect influences on delinquency, though the effects are sometimes modest in comparison to other predictors of delinquency derived from social learning, social bonding, self-control, and strain theories (see reviews by Baier and Wright 2001; Johnson 2009; Johnson et al. 2000; Regnerus 2006). Although many scholars have examined religiosity and overall participation in crime and delinquency, there are few studies of how religiosity affects the dynamics of delinquency, such as abstinence versus initiation and persistence versus desistence. For example, despite its practical and theoretical significance, there has been very little research on the role of religion in desistance from crime and delinquency. Our study helps to fill this gap.

As we noted, substantial research indicates that religious involvement can prevent overall involvement (e.g., initiation) in delinquency. However, little is known about the processes by which religion might foster desistance from crime and delinquency, and there has been little theorizing about the issue (Schroeder and Frana 2009). Nevertheless, it is reasonable to expect that a background of religious involvement might not only foster abstinence from forms of delinquency such as marijuana use, but also later encourage desistance from use if one does become involved. A youth might experiment with or use marijuana for a time, perhaps engaging in the kinds of learning processes related to marijuana use described by Becker (1953). However, a background of earlier religious socialization and involvement in adolescence might lead the youth to eventually reject marijuana use out of guilt or identity dissonance. That is, religious involvement in earlier adolescence, especially more extensive involvement, might lay a foundation of moral beliefs and moral narratives, which could create a moral identity that is influential over the long term (see Smith 2003). Even if a youth experiments with marijuana or uses it for a time (e.g., because of peer pressure, strain, or rebellion), the youth's earlier religious experience and background might form a foundational standpoint from which the youth will eventually reject marijuana use and desist.

We know of only three studies that explicitly focus on religiosity and desistence, and our analysis extends the contributions of both studies in important ways. First, Chu (2007) found that frequency of church attendance was associated with desistance from marijuana and other drug use, and religious salience was negatively related to the onset of drug use, in analyses of Waves V to VII of the National Youth Survey. Like most studies, however, her study utilized limited measures of religiosity, with single items measuring religious behavior (church attendance) and religious salience (perceived importance of religion). In addition, Chu's analysis included few controls for other theoretically important predictors of delinquency and desistance, such as conventional social bonding, peer influence, self-control, and strain.

Second, Giordano and colleagues (2008) examined the effects of religiosity, measured by spirituality (i.e., perceived closeness to God) and church attendance, on desistance using quantitative and qualitative interview data from a sample of socioeconomically disadvantaged offenders. Their quantitative analysis showed no significant effect of either measure of religiosity on the likelihood of sustained desistance. However, their qualitative data did point to several possibilities, as well as limitations, in religion's role in fostering desistance from crime. Specifically, their interviews showed that spirituality, that is, the offender's spiritual or religious experiences, were a potential "hook" for a life course change away from crime in the following ways: (1) Spirituality was structurally and subjectively available as a source of "prosocial capital," (2) spirituality was

associated with positive emotions and a resource for coping with negative emotions, and (3) religion potentially fostered or strengthened ties to prosocial others. However, spirituality, by itself, was often unable to overcome or offset the other criminogenic factors in these offenders' highly disadvantaged and deviance-ridden environments. As in other studies, the data that Giordano and colleagues (2008) used limited them to including only church attendance and self-perceived spirituality, or "closeness to God," as measures of religiosity.

Third, Schroeder and Frana (2009), using qualitative interview data, investigated ways in which men in a halfway house used religion as an emotional coping mechanism in their attempts to desist from substance abuse and other deviance. They found that the men used religion as a form of emotional comfort, a distraction from stress, and a marker of personal change.

THE PRESENT STUDY

This study extends research on religiosity and delinquency, focusing on marijuana use because comparatively little research has addressed the effects of religiosity on changes in substance use across developmental stages, especially during the transition from adolescence to young adulthood. Defining religiosity as an individual's involvement in religion (i.e., religious involvement) to be measured by subjective religiousness as well as religious practice and participation, we examine whether religiosity explains longitudinal patterns of marijuana use. Specifically, we focus on changes in self-reported marijuana use versus nonuse at different time points in adolescence and young adulthood. As we detail below, we employed three waves of the Add Health data, the first two collected in adolescence and the third in young adulthood.

If we control for variables from social learning, conventional social bonding, self-control, and strain, we expect religious involvement during adolescence to reduce the probability not only of initiating drug use, but also, given initiation, of persistence in drug use. Prior research has found significant direct effects of religiosity on involvement in delinquency and drug use that were not mediated by nonreligious theoretical predictors (Baier and Wright 2001; Johnson 2009; Johnson et al. 2000). Thus, controlling for sociodemographic and nonreligious theoretical variables, we expect religious involvement to foster abstinence from marijuana use; and if initiation occurs, we expect adolescent religious involvement to foster desistance during later adolescence and young adulthood.

Our study extends the efforts of Chu (2007), Giordano and colleagues (2008), and Schroeder and Frana (2009) efforts in several important ways. First, we use more extensive measures of religiosity than any of these three studies, which were limited to relying on single measures of church attendance and subjective religiousness, or in the case of Schroeder and Frana (2009), qualitative data. In contrast, we use a multiple-item measure of adolescent religiosity, combining

church attendance, importance of religion, and frequency of prayer, as well as a measure of religious denomination, identification as a born-again Christian, and religious literalism. Compared to Chu's (2007) study, we also include additional measures of other important predictors of delinquency, such as indicators of peer influence, conventional social bonding, self-control, and strain. Doing so will enable us to explore the extent to which religiosity's effects on dynamics of marijuana use, if any, are rendered spurious by other important predictors. Furthermore, whereas Chu did not account for parental religiosity, the data that we use allow us to control for parental religiosity, which is an important influence on youth religiosity and marijuana use and a potentially confounding factor. We also extend Giordano and colleagues' (2008) study by utilizing data from a nationally representative survey of youth rather than a sample of disadvantaged offenders. Finally, we answer Schroeder and Frana's (2009) call for broader work that examines the role of religious factors in the initiation of and desistance from deviance.

We focus on marijuana use for several reasons. First, previous research suggests that recreational substance use is most likely to be affected by religiosity (Burkett and White 1974; Cochran and Akers 1989). Both secular and religious values and institutions condemn serious crime and delinquency, such as violence and stealing, but religious norms are more likely than secular ones to disapprove of excessive drinking and illicit drug use. Second, marijuana use is more prevalent among a wide variety of youths than are more serious forms of delinquency, thus giving us greater behavioral variation to analyze. Third, while marijuana use is a less serious form of delinquency, it can have serious consequences. Marijuana use places youths at risk for negative social reactions, especially arrest, punishment, and formal labeling, which can limit future opportunities (Jang, Bader, and Johnson 2008; Ulmer 1994).

Data and Methods
We used data from the National Longitudinal Study of Adolescent Health (Add Health). For Add Health, a cluster sampling design was used to select 132 schools. A nationally representative sample of 7th through 12th graders and special oversamples of ethnic minorities and students with physical disabilities were drawn from school rosters. Students were interviewed in 1995. For each adolescent respondent, a parent was also interviewed at Wave I. Wave II interviews were conducted in 1996, and Wave III data were collected five years later, when the respondents were 18 to 25 years old. (For a complete description of the Add Health Data, see Bearman, Jones, and Udry 1997.)

Many of the adolescents who were included in the first wave of Add Health were not included in subsequent waves. For example, the vast majority of adolescents who were seniors in high school during Wave I were not reinterviewed for Wave II. In addition to the purposeful dropping of certain members of the original

sample, several thousand adolescents who were eligible for Wave III were not interviewed again because they could not be located or were unable or unwilling to be interviewed again. Analysis of nonresponse suggests that sample attrition introduces very little bias in estimates of marijuana use (less than 0.5 percent), which we use for our dependent variable. (For a complete discussion of non-response in Add Health, see Udry and Chantala 2003.)

To adjust for the effects of nonresponse across waves and the oversampling of special groups, we used sampling weights for our analyses (Chantala and Tabor 1999). In addition, because of the Add Health study's complex cluster sampling design, we specified the primary sampling unit and sampling stratum in which the weights were adjusted. Failing to incorporate the sampling unit, stratum, and sampling weights into the data analysis would result in underestimation of the standard errors of parameter estimates. Therefore, we used Stata's survey data commands, which are suitable for analyzing data such as those of Add Health. Finally, while most variables come from the adolescent survey, we also used Wave I parent data for two variables: parent's religiosity and welfare status (i.e., whether the parent received public assistance). Descriptive statistics for the dependent and independent variables are depicted in Table 1.

Dependent Variables: Patterns of Marijuana Use
To establish the appropriate temporal order between independent and dependent variables, all of the predictor variables are taken from the Wave I survey completed by the adolescents and from the parent survey, while the dependent variable is constructed by using the first, second, and third waves of the survey.

Our dependent variable captures changes in marijuana use during adolescence and young adulthood based on data from Waves I to III of the Add Health study. The Wave I measure asks respondents whether they have ever used marijuana, while the Wave II measure asks about their use since Wave I, roughly a year earlier. The Wave III measure asks about marijuana use since Wave II, about five years earlier. The dependent variable is coded 0 = abstinence (never used in any wave), 1 = initiation (never used at Wave I, used at Wave II, used at Wave III *or* never used at Wave I, did not use at Wave II, used at Wave III), 2 = intermittence (used at Wave I, did not use at Wave II, used at Wave III), 3 = desistance (used at Wave I, did not use at Wave II, did not use at Wave III, *or* used at Wave I, used at Wave II, did not use at Wave III, *or* never used at Wave I, used at Wave II, did not use at Wave III), and 4 = persistence (used at all three waves).

To elaborate, the *initiation* category (21 percent) included individuals who did not use marijuana at Wave I but did use at Waves II and III and individuals who did not use at the first two waves but did use at Wave III. The first group represents those who initiated marijuana use between Waves I and II, while the second group represents adolescents who initiated marijuana use between Waves

II and III. The *intermittence* category (5%) smoked marijuana at Wave I, did not use at Wave II, and then used again at Wave III.

Table 1: Descriptive Statistics for Dependent and Independent Variables

Variable	Range	Mean	Standard Deviation
Religiosity			
Catholic	0–1	0.27	0.44
Evangelical Protestant	0–1	0.15	0.36
Black Protestant	0–1	0.17	0.37
Mainline Protestant	0–1	0.19	0.39
Other affiliation	0–1	0.10	0.30
No religion	0–1	0.12	0.33
Religious literalism	0–1	0.66	0.47
Born-again	0–1	0.26	0.44
Parental religiosity	0–9	6.79	2.56
Adolescent religiosity	0–9	5.84	3.15
Individual Characteristics			
Sex	0–1	0.45	0.50
Age	11–21	16.16	1.72
African-American	0–1	0.21	0.41
Asian	0–1	0.06	0.24
Other race	0–1	0.05	0.22
White	0–1	0.50	0.50
Hispanic	0–1	0.17	0.38
Biological family	0–1	0.51	0.50
Welfare	0–1	0.19	0.39
Parent education	0–18	13.73	2.69
Grades	0–4	2.68	0.87
Parental attachment	0–20	16.67	3.11
School attachment	0–20	13.42	3.76
Delinquent peers	0–3	.63	1.00
Self-control	0–44	30.78	5.13
		Frequency	**Percent**
Dependent Variable			
Abstinence	0–1	4,950	46.6
Initiation	0–1	2,182	20.5
Cessation/discontinuation	0–1	2,307	21.7
Intermittence	0–1	537	5.1
Persistence	0–1	650	6.1
Total:	**10,626**		

Adolescents who used marijuana at Wave I but did not use marijuana at Wave II and did not use marijuana at Wave III were placed in the *desistance* category (22 percent). Adolescents who used marijuana at Waves I and II but did not use marijuana at Wave III were also placed in the desistance category. The first group represents adolescents who discontinued marijuana use between Waves I and II, while the second group represents adolescents who stopped using marijuana between Waves II and III. Adolescents who did not use marijuana at Wave I, used marijuana at Wave II, but did not use marijuana at Wave III were also placed in the desistance category. We considered classifying adolescents who fit this pattern as intermittent users. However, we decided to put them in the desistance category, reasoning that desistance was ultimately defined by not using marijuana years later at Wave III. That is, even for adolescents who did not use marijuana at Wave I but did use marijuana at Wave II, the most important aspect of their pattern of marijuana use was that they had stopped using marijuana again at Wave III. In supplemental analyses, we replicated our models with different categorizations of our dependent variable, in which we included adolescents who did not use at Wave I, used at Wave II, and stopped using at Wave III in the intermittence category. The results did not differ substantially from those pre-sented here.

Desistance is harder to study definitively than are initiation and abstinence, since researchers can never be sure that a person has completely desisted, that is, terminated crime or deviance permanently. Scholars in crime and delinquency increasingly think of desistance as a process and refer to desistance as a defined period rather than a discrete event that happens once and for all (Bushway, Thorn-berry, and Krohn 2001; Maruna 2001). Maruna (2001: 26) defines desistance as "the long term abstinence from crime among individuals who had previously engaged in persistent patterns of criminal offending." In most studies, desistent individuals are defined as individuals who have not offended for a certain amount of time. We use this concept of desistance here.

Religiosity

In the first wave of data collection, Add Health included several religion items: religious affiliation, religious service attendance, importance of religion, fre-quency of prayer, self-identification as a born-again Christian, and religious literalism. *Adolescent religiosity*, referring to an adolescent's religious involve-ment measured by his or her subjective religiousness as well as religious practice and participation, was measured in terms of frequency of religious service atten-dance, perceived importance of religion, and frequency of prayer. Each of these three aspects of religiosity was measured with a four-point Likert scale (0 to 3). We summed scores on the three items to construct a composite measure (α = 0.875), which ranges from 0 to 9, with higher scores indicating greater religiosity.

Parents were asked the same three questions, so *parental religiosity* was constructed in the same way ($\alpha = 0.832$).

We intend to examine the effects of adolescent religious involvement, that is, the strength of personal religious salience and observance, as distinct from other religious factors. Therefore, we constructed a measure of *religious denomination* based on adolescents' responses to a question about their religious affiliation, which were then grouped into a series of dummy variables using Steensland and colleagues' (2000) RELTRAD classification scheme. Although the RELTRAD scheme includes seven categories, we combined Jewish youths with the "other" (e.g., Mormon, Jehovah's Witness, Muslim, Hindu, and Unitarian) category because there were few Jewish adolescents in the Add Health sample. Our six categories are mainline Protestant, evangelical Protestant, black Protestant, Catholic, other affiliation, and no religion, with no religion being used as the reference category in our analysis. Besides this denominational measure, adolescents were asked whether they thought of themselves as *born-again Christians* (0 = no, 1 = yes) and whether they agreed (= 1) or disagreed (= 0) that the sacred scriptures of their religion were the word of God and completely without any mistakes (*religious literalism*). These latter two variables measure evangelical Christian conservatism and are included because they have been found to correlate with reduced drug use above and beyond personal religious involvement (Steensland et al. 2000; Wallace et al. 2003).

Control Variables
We included sociodemographic variables to control for possible sources of spuriousness due to their associations with our key variables. Included in our model are adolescents' *sex* (0 = female, 1 = male), *age* (computed by subtracting the interview date from the adolescent's date of birth), race (for which four dummy variables were constructed for *African-American*, *Asian*, *other race*, and *white*, with white as the reference category), ethnicity (0 = non-Hispanic, 1 = *Hispanic*), *intact family* (0 = not living with both biological parents, 1 = living with both biological parents), and two measures of social class: *parents' education* and *welfare status* (0 = did not receive public assistance, 1 = received welfare). We also included a measure of adolescents' *grade point average* in four subjects: English or language arts, math, history or social studies, and science ($\alpha = 0.982$).

In addition to demographic variables, we controlled for other theoretically important predictors of delinquency, including conventional social bonding, delinquent peer influence, self-control, and strain. *Parental attachment* was measured by using five items that asked about the adolescents' relationships with their parents in terms of affective ties, close communication, and general satisfaction with the relationship. Because the same items were repeated for mothers and fathers, we first constructed two subscales—attachment to mother ($\alpha = 0.941$) and

attachment to father (α = 0.980)—before averaging the subscales to form a single measure of attachment to parents. *School attachment* was measured by using five items about adolescents' sense of belonging to school as well as positive feelings toward school, teachers, and other people at school (α = 0.761). To measure *delinquent peers*, an important dimension of social learning theory, we employed an item that asked youths how many of their "three best friends" used marijuana at least once a month (0 = no friends, 1 = one friend, 2 = two friends, 3 = three friends). *Self-control* was measured by using eleven items, most assessing how adolescents make decisions and/or solve problems, that capture many of the dimensions of self-control, such as a lack of planning and/or consideration for the long-term implications of behavior, a preference for simple and immediate problem resolution, and a tendency to be physical rather than mental (α = 0.711). Finally, we constructed a measure of *negative emotions*, a key concept from general strain theory, using nine items that asked youths about the extent of their experiences of depression and anxiety (α = 0.832).

RESULTS

Initiation of Marijuana Use

Given that our dependent variable represents nominal categories that cannot be ordered, we used multinomial logistic regression (Long 1997). Table 2 depicts the results for a series of multinomial logistic regressions focusing on initiation of marijuana use. The first column in Table 2 shows the results for adolescents who abstained from using marijuana compared to adolescents who initiated marijuana use at Wave II or III. Adolescent religious involvement has a significant negative effect on the initiation of marijuana use. Religious youths are moderately more likely to abstain from marijuana use than to initiate use. Interestingly, the results suggest that Catholics, compared to adolescents with no religious affiliation, are significantly more likely to initiate marijuana use than to abstain. Mainline Protestants and adolescents with "other" religious affiliations are also more likely to initiate marijuana use than to abstain, compared to adolescents with no religious affiliation.

The second column of Table 2 depicts the results for adolescents who abstained from using marijuana compared to adolescents who were persistent users (i.e., used marijuana at all three waves of the survey). Similar to the results for abstention versus initiation, the results for abstention versus persistence suggest that Catholics and mainline Protestants, compared to adolescents with no religious affiliation, are significantly more likely to be persistent marijuana users than to be abstainers. In contrast, adolescents who believe in a literal interpretation of the sacred scriptures of their religion are less likely to be persistent users. Adolescent religious involvement also significantly decreases the likelihood of persistent use.

TABLE 2: Multinomial Logistic Regression for Initiation of Marijuana (Standard Errors)

	Abstention (Contrast) Versus Initiation	Abstention (Contrast) Versus Persistence	Intermittence (Contrast) Versus Persistence
Catholic	0.986	0.820	0.283
	(0.217)**	(0.365)*	(0.439)
Evangelical Protestant	0.476	0.510	0.383
	(0.246)	(0.393)	(0.465)
Black Protestant	0.593	0.846	−0.172
	(0.319)	(0.592)	(0.800)
Mainline Protestant	0.667	0.763	0.516
	(0.236)**	(0.330)*	(0.465)
Other affiliation	0.597	0.779	0.335
	(0.248)*	(0.398)	(0.462)
Religious literalism	−0.107	−.0442	−0.129
	(0.116)	(0.203)*	(0.224)
Born-again Christian	0.101	−0.159	−0.083
	(0.114)	(0.214)	(0.267)
Parental religiosity	−0.042	−0.040	−0.003
	(0.022)	(0.031)	(0.032)
Adolescent religiosity	−0.060	−0.101	−0.047
	(0.023)*	(0.039)*	(0.047)
Sex	0.528	0.411	−0.343
	(0.082)**	(0.157)*	(0.186)
Age	−0.279	0.144	0.020
	(0.031)**	(0.066)*	(0.071)
Black	−0.325	−00.831	0.112
	(0.215)	(0.589)	(0.758)
Asian	−0.779	−0.875	−0.398
	(0.191)**	(0.483)	(0.776)
Other race	−0.106	0.102	0.201
	(0.207)	(0.273)	(0.343)
Hispanic	−0.336	−0.191	0.296
	(0.141)*	(0.281)	(0.294)
Biological family	−0.032	−0.606	−0.181
	(0.092)	(0.164)**	(0.192)
Welfare	−0.312	−0.461	−0.546
	(0.126)*	(0.259)	(0.303)
Parent education	0.081	0.117	0.031
	(0.022)**	(0.034)**	(0.039)
Grades	−0.093	−0.023	0.126
	(0.054)	(0.108)	(0.124)
Parental attachment	−0.042	−0.059	−0.038
	(0.018)*	(0.021)**	(0.037)
School attachment	−0.007	−0.047	−0.026
	(0.014)	(0.029)	(0.032)
Delinquent peers	0.299	1.482	0.345
	(0.075)**	(0.087)**	(0.089)**
Self-control	−0.057	−.083	−0.017
	(0.010)**	(0.018)**	(0.019)
Negative emotions	−0.023	0.017	−0.013
	(0.015)	(0.024)	(0.029)

$* p < 0.05$; $** p < 0.01$.

The third column of Table 2 compares intermittent use with persistent use. In this comparison, none of the denominational variables affect the likelihood of intermittent versus persistent use. Also, religious literalism, being a born-again Christian, parents' religious involvement, and adolescents' religious involvement do not significantly differentiate intermittent versus persistent marijuana use. In fact, the only variable that significantly predicts persistence versus intermittence is delinquent peers. Adolescents who associate with more marijuana-using peers are more likely to be persistent marijuana users and less likely to be intermittent marijuana users.

Desistance from Marijuana Use

Table 3 depicts the results for a series of multinomial logistic regressions focusing on desistance from marijuana use compared with other patterns. The first column in Table 3 shows the results for adolescents who abstained from marijuana compared to adolescents who stopped marijuana use. The results suggest that religiosity does not have a significant effect on abstention from marijuana versus desistance from marijuana use. There are no denominational differences for this comparison, and religious literalism, being a born-again Christian, parents' religious involvement, and adolescents' religious involvement do not differentiate those who never used marijuana from those who used and then desisted from marijuana.

The second column in Table 3 depicts the results for adolescents who used marijuana intermittently versus those who desisted. Similar to the results for abstention versus desistance, there are no significant effects for religious affiliation. More important, adolescent religiosity does not have a significant effect when intermittent marijuana users are compared to adolescents who stopped marijuana use, nor does religious literalism, being a born-again Christian, or parents' religious involvement have a significant effect.

The final column in Table 3 shows the results from comparing persistent marijuana users with adolescents who desisted from marijuana use. Similar to previous results, Catholics and mainline Protestants, compared to youths with no affiliation, are substantially more likely to be persistent marijuana users than to use marijuana and then desist. The desistance odds for Catholics are 46 percent less than those of youths with no affiliation, and mainline Protestants' desistance odds are comparable to those of Catholics. Youths who believe in a literal interpretation of the sacred scriptures of their religion are more likely to desist from marijuana use (given initial use) than to persist. Adolescents' religious involvement does not have a significant effect in differentiating persistence from desistance.

TABLE 3: Multinomial Logistic Regression for Desistance from Marijuana Use (Standard Errors)

	Abstention (Contrast) Versus Desistance	Intermittence (Contrast) Versus Desistance	Persistence (Contrast) Versus Desistance
Catholic	0.196	−0.341	−0.624
	(0.224)	(0.380)	(0.297)*
Evangelical Protestant	0.258	0.132	−0.251
	(0.218)	(0.401)	(0.360)
Black Protestant	0.298	−0.720	−0.548
	(0.276)	(0.729)	(0.543)
Mainline Protestant	0.147	−0.100	−0.616
	(0.220)	(0.434)	(0.288)*
Other affiliation	0.311	−0.133	−0.468
	(0.221)	(0.414)	(0.362)
Religious literalism	−0.023	0.290	0.420
	(0.146)	(0.216)	(0.196)*
Born-again Christian	−0.185	−0.109	−0.026
	(0.126)	(0.206)	(0.229)
Parental religiosity	−0.011	0.026	0.029
	(0.022)	(0.033)	(0.028)
Adolescent religiosity	−0.052	0.002	0.049
	(0.028)	(0.040)	(0.035)
Sex	0.110	−0.644	−0.301
	(0.094)	(0.191)**	(0.158)
Age	0.039	−0.086	−0.105
	(0.029)	(0.051)	(0.058)
Black	−0.466	0.476	0.364
	(0.243)	(0.630)	(0.557)
Asian	−0.216	0.261	0.659
	(0.294)	(0.724)	(0.556)
Other race	0.129	0.228	0.027
	(0.199)	(0.267)	(0.270)
Hispanic	0.107	0.594	0.298
	(0.184)	(0.264)*	(0.253)
Biological family	−0.308	0.118	0.299
	(0.094)**	(0.178)	(0.177)
Welfare	−0.111	−0.197	0.350
	(0.127)	(0.207)	(0.268)
Parent education	0.040	−0.046	−0.077
	(0.021)	(0.033)	(0.034)*
Grades	−0.184	−0-.034	−0.161
	(0.060)**	(0.109)	(0.113)
Parental attachment	−0.038	−0.017	0.022
	(0.016)*	(0.028)	(0.023)
School attachment	−0.041	−0.020	0.006
	(0.014)**	(0.025)	(0.022)
Delinquent peers	0.820	−0.318	−0.662
	(0.066)**	(0.075)**	(0.072)**
Self-control	−0.040	0.025	0.043
	(0.012)**	(0.023)	(0.018)*
Negative emotions	0.007	−0.023	−0.010
	(0.014)	(0.028)	(0.023)

* $p < 0.05$; ** $p < 0.01$.

CONCLUSIONS

This study fills a gap in the literature by assessing the effects of religiosity on changes in marijuana use between adolescence and young adulthood, specifically initiation, intermittence, desistance, and persistence. We predicted that individual religiosity would protect against the initiation of marijuana use and would foster desistance rather than persistence if individuals did use marijuana. Our results regarding initiation of marijuana use support our first hypothesis. Religious youths are significantly more likely to abstain from using marijuana than to initiate use. Religious youths are even more likely to be abstainers than to be persistent users. Among marijuana users, however, adolescent religiosity does not significantly predict desistance, nor does it influence the likelihood of being an intermittent versus a persistent user. Taken together, these results suggest that the major role of adolescent religiosity is in preventing youths from using marijuana in the first place.

Youths who were more religious were less likely ever to use marijuana than were those who were less religious, regardless of denomination. Also, controlling for whether they have any particular denominational affiliation, adolescents who believe in a literal interpretation of religious scriptures are more likely never to use marijuana than to persist, and they are more likely to desist than to persist. However, identification as a born-again Christian and parental religiosity did not significantly differentiate youths in their marijuana use. Therefore, it appears that the endorsement of religious literalism is more predictive of marijuana use patterns than are alternative measures of religious conservatism, such as self-identification as a born-again Christian or membership in an evangelical Protestant tradition.

On the other hand, differences in marijuana use between adolescents who have a religious affiliation and those who identify with "no religion" are not as readily explained. Both Catholics and mainline Protestants were more likely than adolescents with no religious affiliation to initiate marijuana use or to be persistent marijuana users rather than nonusers. In addition, Catholics were more likely than adolescents with no religious affiliation to be persistent marijuana users rather than to desist.

It is important to understand that the observed denominational differences in marijuana use patterns are found when we account for individual religiosity and religious belief (i.e., religious literalism) and identification as a born-again Christian, as well as the other predictors in our models. The denominational differences are therefore not attributable to any differences between religious and nonreligious adolescents in those variables, including the measures of religious involvement, salience, observance, identity, and belief. In supplementary models (available on request), each of the denominational variables had either significant negative effects or no significant effects on initiation and persistence in marijuana

use when our other religion measures were omitted. Thus, the positive associations between Catholic and mainline Protestant membership and initiation and persistence in marijuana use appear only when we control for religiosity and religious conservatism. This suggests that adolescents who are affiliated with relatively liberal denominations (i.e., Catholic and mainline Protestant) appear to be at higher risk of marijuana use than their "no religion" counterparts, once we take into account how religious they are in their behaviors and beliefs.

Unfortunately, the data do not allow us to understand these denominational differences empirically. Perhaps the denominational effects reflect differences in the degree to which different traditions regulate and condemn forms of deviance such as marijuana use. While no mainstream religious tradition condones recreational marijuana use, especially among youths, different denominations might vary in the degree to which they emphasize the sinfulness of marijuana. The Add Health data do not measure such variation. Therefore, research is needed that further explores interdenominational differences in the extent to which recreational forms of deviance such as marijuana use are condemned and the influences this condemnation may have on young adherents' use.

It is also important to note that the comparison group for the analyses is those who profess no religious affiliation. Evidence exists in some surveys that many respondents in the "no religion" group attend independent, nondenominational churches that may reject organized religion or religious labels, and these individuals may choose not to identify with the broad categories that are typically listed on surveys (e.g., Baptist, Methodist, or Presbyterian), though they readily indicate that they are religious (Dougherty, Johnson, and Polson 2007). If the respondents in the Add Health data exhibit this pattern, then some of those who professed no religion could in fact have been quite religious. Unfortunately, it is not possible to examine this conjecture, since the Add Health survey does not ask those who answer "none" to the religious identification question the more refined religion questions.

Although we believe that this study contributes to the literature by examining whether religious involvement during adolescence influences changes in marijuana use during the transition from adolescence to young adulthood, it would be of great interest to investigate how changes in religiosity over time affect the dynamics of marijuana use and other forms of delinquency. For example, Uecker, Regnerus, and Vaaler (2007) found that many young adults experience declines in religiosity in young adulthood and that drug and alcohol use foster diminished religiosity. It would be interesting to examine whether declining religiosity from adolescence to young adulthood also predicts the use of marijuana and other drugs in young adulthood. Conversely, does increased religiosity from earlier adolescence lead to desistance from marijuana use or other delinquency in later adolescence or early adulthood?

Because the Add Health data consist of multiple waves, we considered examining the effects of change in religiosity over time on adolescent marijuana use. Unfortunately, the three items that we used to measure adolescent religiosity—church attendance, importance of religion, and frequency of prayer—were changed from Wave I to Wave III. Since the religiosity items were changed between survey waves, it is difficult to tell whether changes in religiosity reflected meaningful changes or simply differences in measurement.

We conducted a supplementary analysis examining the effects of changes in adolescents' religious involvement from Wave I to Wave III on their patterns of marijuana use, attempting to make the Wave I and Wave III measures as comparable as possible.[1] After computing change in religious involvement from Wave I to Wave III (a scale that ranged from 9 to −9), we created a set of dummy variables: increased religiosity, decreased religiosity, and no change from Wave I to Wave III.

The results of this analysis of change in religiosity were consistent in spirit with the results in Table 2. Respondents who were relatively high in religiosity at Wave I and remained so later were significantly more likely to abstain from marijuana than to initiate or persist in use. Those whose religiosity decreased over time were significantly more likely to initiate marijuana use and to persistently use marijuana. An increase in religious involvement over time, however, did not have a significant effect on marijuana use patterns. Given changes in the way in which adolescent religious involvement was measured over time, however, these results must be viewed with caution. Future research that examines how changes in religiosity correlate with changes in delinquency (i.e., persistence or desistance) with comparable data over time would be beneficial to our understanding of the relationship between religion and the dynamics of delinquent behavior.

Finally, the effects of adolescent religiosity on patterns of marijuana use, particularly in discouraging initiation, were not rendered spurious when we controlled for the theoretically relevant predictors that we included. This is consistent with previous findings in delinquency research (Baier and Wright

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[1] At Wave I, church attendance was measured on a four-point scale: 0 = never, 1 = less than once a month, 2 = once a month or more, but less than once a week, and 3 = once a week or more. At Wave III, church attendance was measured on a seven-point scale: 0 = never, 1 = a few times, 2 = several times, 3 = once a month, 4 = 2 to 3 times a month, 5 = once a week, and 6 = more than once a week. To make the measures comparable, we combined Wave III categories 5 and 6 (reasoning that these were equivalent to "once a week or more," as measured at Wave I), categories 3 and 4 (equivalent to "once a month or more, but less than once a week" as measured at Wave I), and categories 1 and 2 (equivalent to "once a month or more, but less than once a week"). We performed similar operations for importance of religion and frequency of prayer; then we combined the three items into a single measure of religious involvement at Wave III, just as we did for Wave I.

2001; Johnson 2009; Johnson et al. 2000). The finding that many of the effects of religiosity are unmediated and not attributable to secular factors supports the argument of Pargament, Magyar-Russell, and Murray-Swank (2005) that the effects of religion on behavior are unique in that they are not wholly attributable to nonreligious social or psychological factors.

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