

# DOES HIGHER EDUCATION CAUSE RELIGIOUS DECLINE?: A Longitudinal Analysis of the Within- and Between-Person Effects of Higher Education on Religiosity

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Although there is ample empirical evidence of the associations between higher education and various aspects of religiosity, the causal mechanisms producing these associations remain unclear. I use four waves of longitudinal data, with respondents ranging in age from 13 to 29, to model the within- and between-person effects of higher education on several measures of religiosity. The results show that earning a bachelor's degree is associated with within-person declines in some but not all measured aspects of religiosity, which partially supports the argument that higher education causes religious decline. The results also suggest that those predisposed to attending religious services self-select into higher education, that relatively religious youth in general self-select into nonelite colleges, and that those with low levels of religious belief self-select into elite universities. These findings further understanding of the associations between social class and religion, particularly the causal effects of higher education.

**Keywords:** education; religion; longitudinal analysis

## INTRODUCTION

Throughout the 20th century, it was generally taken for granted that the highly educated were less religious than those without a college education (Casanova 1994), and empirical research often supported this proposition (e.g., Caplovitz and Sherrow 1977; Albrecht and Heaton 1984; Beckwith 1985; Funk and Willits 1987; Johnson 1997; for a discussion of older research, see the review by Feldman 1969). More recent research, however, questions the assumption that higher education causes religious decline. Contemporary American sociologists emphasize the plurality of religious options that appeal to diverse religious preferences (Stark and Finke 2000), the compartmentalization of religious and secular perspectives (Campbell 2005; Clydesdale 2007), and opportunities for religious expression on today's college campuses (Cherry, DeBerg, and Portfield 2001; Schmalzbauer 2013), all of which may promote religiosity among the college-educated. Indeed, empirical research shows that while having a bachelor's degree is negatively associated with some religious beliefs, it is positively correlated with religious participation (e.g., Hill 2011; Schwadel 2011). Although social scientists have

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provided ample empirical evidence of the associations between higher education and religiosity, the causal mechanisms producing these associations remain unclear.

Does the curricular, cultural, and social content of higher education promote low levels of religious belief and high levels of religious participation? This causal argument suggests that changes in belief and participation should occur while in college and be relatively concurrent with graduation. Moreover, these changes in religiosity should differ by type of educational institution since the curricular, cultural, and social milieu vary across educational contexts. In contrast to the causal model, the associations between higher education and religiosity may instead be due to the selection of specific groups into higher education. For instance, college graduates are relatively likely to come from homes with highly educated parents (Archer, Hutchings, and Ross 2003; Reisel 2011) and high levels of cultural capital (Bourdieu 1977); and adolescent and emerging adult religiosity varies considerably by such parental characteristics (Arnett and Jensen 2002; Schwadel 2008; Pearce, Hardie, and Foster 2013). Stratification in access to higher education can thus produce meaningful associations between higher education and religiosity while higher education itself may be unrelated to within-person changes in religion. In other words, the effect of higher education on religiosity may be a “selection effect” (Wuthnow and Mellinger 1978; Hill 2009).

This article expands understanding of the causal effects of higher education on religion by simultaneously modeling the *within-* and *between-person* effects of higher education on several measures of religiosity. The analysis addresses two distinct but related questions. First, does attending and graduating from college cause individual change in religiosity? Second, are there meaningful differences in religiosity between those who attend and graduate from college and those who do not? In what follows, I first review the literature on higher education and religiosity in the United States, focusing on the potential for causal and noncausal associations. I then use multilevel models and four waves of longitudinal data, with respondents ranging from 13 to 29 years of age, to examine the following: (1) how being in and graduating from college influence within-person changes in religiosity; (2) how being in and graduating from college influence between-person differences in religiosity; and (3) if these within- and between-person effects vary by type of educational institution. I conclude by discussing how the findings further understanding of the associations between social class and religion, particularly the causal effects of higher education.

## PREVIOUS RESEARCH ON HIGHER EDUCATION AND RELIGIOSITY

Social scientists historically have focused on the potential negative effects of higher education on religiosity. Early sociologists such as Comte ([1865]2009) welcomed the decline of religion with the advancement of modernity while others such as Durkheim ([1915]1965) were concerned about the future of religion in an increasingly differentiated society. Whether they thought religion was harmful or beneficial, the overriding sentiment throughout the 20th century was that religion was destined to decline, and that higher education was a key source of this decline (Casanova 1994).

Empirical research in the United States from the 1950s through the 1990s largely supported the view that higher education is antithetical to at least some aspects of religiosity. Research using samples of college students emphasized declines in religiosity during college (e.g., Stark 1963; Feldman 1969; Becker 1977), which suggests that higher education affects within-person changes in religiosity. Other research focused on differences between college-educated and noncollege-educated Americans. This research also supported the traditional secularization argument by demonstrating that those with a college education were less likely than those without a college education to hold key religious beliefs and to affiliate with religion more generally (e.g., Caplovitz and Sherrow 1977; Beckwith 1985; Johnson 1997).

More recent research, however, paints quite a different picture of the relationship between higher education and religion. Attending and graduating from college continue to be associated with questioning religious beliefs, but not with a lack of religiosity more generally (Lee 2002; Hill 2011; Schwadel 2011). Those who graduate from college are now the least likely to disaffiliate from religion (Uecker, Regnerus, and Vaaler 2007; Schwadel 2014), and the most likely to attend religious services (Hill 2009; Schwadel 2011). The contemporary understanding of the relationship between higher education and religiosity is that college education is positively associated with some dimensions of religiosity—particularly the participatory dimensions—and negatively associated with others—particularly beliefs. I expand on this research by examining if these associations are causal in nature or are due to the selection of specific groups into higher education.

### **CAUSAL EFFECT OF HIGHER EDUCATION OR SELECTION INTO HIGHER EDUCATION?**

There are various causal mechanisms posited to explain the empirically established associations between higher education and religiosity. The most prominent argument for higher education promoting declines in religious belief is the conflict between the cultural and curricular content of higher education and some religious beliefs (e.g., Wilson 1982; Beckwith 1985; Johnson 1997). Higher education leads to greater scientific knowledge (Evans 2009), an emphasis on the scientific worldview (Miller 1967; Cherry et al. 2001), and exposure to diverse opinions and cultures (Balswick, Ward, and Carlson 1975; Moiseyenko 2005). These aspects of higher education can directly conflict with religious beliefs, as demonstrated by debates over Darwinian evolution or the age of the Earth, and more broadly, conflict with religious perspectives and a general reliance on faith. Differences in social networks and social contexts may also lead to religious decline among the highly educated (Mayrl and Uecker 2011). Religious commitment and worldviews are reinforced through regular interaction with a religious community (Cornwall 1989; Iannaccone 1994). Highly educated Americans have relatively diverse social relations (Marsden 1987; McPherson, Smith-Lovin, and Cook 2001), which leads to greater interaction with those outside of the religious community, and thus diminishes commitment to exclusivist religious perspectives (Putnam and Campbell 2010).

The positive association between education and religious participation is often attributed to the participatory nature of the highly educated. Higher education promotes organizational and social participation (Putnam 1995). The college-educated are relatively likely to learn and practice fundamental civic skills that help them navigate and contribute to organizations (Verba, Schlozman, and Brady 1995), including religious organizations (Schwadel 2002; Djupe and Gilbert 2006; Hill 2009). Consequently, as Sacerdote and Glaeser (2001:3) argue, “The positive social effect of education explains the positive education-religion relationship.”

In contrast to these causal arguments for why higher education is negatively associated with religious belief and positively associated with religious participation, it may be that those who are predisposed to lower levels of belief and/or higher levels of religious participation self-select into higher education. Background and early socialization factors can promote both higher education and religiosity, or lack thereof. This is what Wuthnow and Mellinger (1978:241) concluded from their analysis of students at an elite university in the mid-1970s:

These data suggest that what often have been taken as college effects in comparing the religious commitments of the college educated with those having no college education may be due more to differences in family background and early socialization than to the college experience itself.

Indeed, children and adolescents who eventually attend and graduate from college differ in important ways from those who do not. Most obviously, they are relatively likely to come from middle- and upper-class homes (Archer et al. 2003; Reisel 2011). Parents' social class, and especially their education, is a key source of cultural capital (Bourdieu 1977), meaning that those who attend college have often been exposed to unique social, cultural, and academic perspectives throughout their childhoods. Perhaps most importantly, parents' social class also impacts their children's religiosity, and in the same ways in which higher education is hypothesized to influence religiosity. Namely, the children of middle- and upper-class parents are relatively unlikely to hold certain religious beliefs and relatively likely to participate in religious activities (Arnett and Jensen 2002; Schwadel 2008). As Wuthnow and Mellinger (1978) noted almost four decades ago, this suggests that the religious trajectories of the college-educated may differ from the noncollege-educated long before they set foot on campus. The positive effect of adolescent religious participation on educational outcomes (Loury 2004; Glanville, Sikkink, and Hernández 2008) further suggests that distinctive religious characteristics often precede higher education. The analyses in this article address the potential for such selection effects by disaggregating the within- and between-person effects of higher education on religiosity.

## **ACCOUNTING FOR ELITE UNIVERSITIES**

Campus culture and student populations vary considerably across institutions of higher education, suggesting that type of college or university impacts the association between

education and religiosity. The culture of elite universities is shaped by their place in the status hierarchy (Kuh and Whitt 1988). Faculty at more selective universities tend to be less religious than other faculty (Gross and Simmons 2009). For these professors, secularity can function as a means of differentiating themselves and their fields of study from the general population (Wuthnow 1985). When students at elite universities interact with such faculty, they may incorporate the secular emphasis into their own identities (Stark 1963; Bryant 2011), as identities are especially malleable when there are large perceived differences between individual and organizational identities (Kreiner, Hollensbe, and Sheep 2006). The culture of elite universities can be seen as an alternative to religion for some students (Zelan 1968; Cragun 2007), which may lead to greater changes in religiosity for those students. The student body at elite universities can also promote declines in religion since peers strongly influence religious identities, particularly during young adulthood (Cheadle and Schwadel 2012). For instance, empirical research shows that college students with peers who are not religiously active are likely to become less religiously active themselves (Becker 1977). In sum, the organizational culture, faculty, and students at more selective universities may be particularly detrimental to religiosity (Hill 2011).

## **ANALYTIC GOALS**

This article expands understanding of the causal effects of higher education on religiosity with improved data and methods. The primary limitation to previous longitudinal research on the subject is the reliance on two waves of data; and relatedly, the lack of respondents with a bachelor's degree, which confined researchers to focusing on the impact of being in college (e.g., Lee 2002; Uecker, Regnerus, and Vaaler 2007; Mayrl and Uecker 2011). As Raudenbush and Bryk (2002:161) note, "Such designs are often inadequate for studying individual growth." Additional waves of data make it possible to employ multilevel growth curve models, which I use to disaggregate the within- and between-person effects of higher education on religiosity. The models below specify how changes in education over the early adult life course (i.e., college attendance and graduation) influence within-person changes in religiosity, thereby addressing the assumption that education has a potentially causal effect on religiosity. Aggregate or time-invariant measures of higher education assess differences between people, thereby addressing the assumption that higher education explains differences in religiosity across individuals. The analysis below also furthers understanding of the effects of education on religiosity by employing a wide range of measures of religiosity, thus addressing the multidimensionality of religious belief and practice (Yinger 1970; Holdcroft 2006). Finally, institutional variation in educational experiences indicate that the type of college or university should be assessed.

## **DATA AND METHODS**

I use data from the longitudinal National Study of Youth and Religion (NSYR) to examine the associations between higher education and religiosity. The NSYR is a four-wave survey. The first wave, collected in 2002 to 2003, used random-digit-dialing to produce

a random sample of 3,290 U.S. adolescents ages 13 to 17.<sup>1</sup> One parent of each adolescent was also surveyed in wave 1. The response rate was 57 percent according to AAPOR RR4 (American Association for Public Opinion Research, Response Rate 4). The adolescent respondents were surveyed again in 2005 (N = 2,530), 2007 to 2008 (N = 2,458), and 2013 (N = 2,071). All interviews were conducted by telephone in the first three waves of data collection. In wave 4, 15 percent of surveys were conducted by telephone and the remaining surveys were administered online. After deleting one case that was missing key respondent-level data, the final sample size consists of 3,289 respondents with between one and four waves of data, resulting in between 9,348 and 10,242 observations across the six dependent variables. With respondents ranging in age from 13 to 29 across the four waves,<sup>2</sup> the longitudinal NSYR has data before, during, and after the traditional college age range. Combined with detailed information about religiosity and college attendance, this makes the NSYR data uniquely suited to address the question of how college attendance and graduation affect religiosity. See Smith and Denton (2008) for more information on the NSYR.

### Analysis Technique

I employ multilevel growth curve models to examine the within- and between-person effects of higher education on religiosity. Individual respondents are the level-2 unit of analysis. Waves of data collection are the level-1 unit of analysis. These models are preferable to other methods of estimating individual change because they explicitly model individual variation in change, they have more flexible data requirements such as allowing the number and spacing of observations to vary, and most importantly, they are designed to examine the characteristics that may explain change (Raudenbush and Bryk 2002; Singer and Willett 2003). Although fixed-effects models are sometimes used to control for unmeasured individual-level attributes that may be correlated with the independent variables, “[o]nce the time-varying unit-level means are included, this correlation is essentially controlled for in the model” (Finkel 2008:483). Moreover, the fixed-effects approach cannot address differences between people while multilevel growth curve models assess both within- and between-person effects.

Within- and between-person effects are modeled with time-varying and time-invariant independent variables, respectively. Time-varying measures, such as age and education, change across waves of data for each respondent. Time-varying measures are included in the level-1 model, and with proper model specification (see next paragraph), they indicate within-person change. Time-invariant measures, such as sex and race, vary across people but not within person. In other words, the value of a time-invariant measure for respondent *i* is constant across waves of data collection. Time-invariant measures are included in the level-2 model, and they indicate differences between people (see Curran and Bauer 2011).

The growth curve model literature suggests that to ensure proper estimation of within- and between-person effects, level-2 variables should be centered on the overall or grand mean and level-1 variables should be centered on the respondent mean (Raudenbush and Bryk 2002; Singer and Willett 2003). Consequently, time-varying

(i.e., level-1) variables are centered on the respondent mean and time-invariant (i.e., level-2) variables are centered on the overall or grand mean. The means of time-varying or level-1 variables are included in the level-2 model (Singer and Willett 2003; Finkel 2008). These model specifications assure that the time-varying effects indicate within-person change—thus representing the potential causal influence of education on changes in an individual's religiosity—and the time-invariant effects indicate differences between people. All analyses are weighted and conducted in HLM 7.

### Dependent Variables

The dependent variables are time-varying indicators that vary within-person across waves of data (see Table 1 for descriptive statistics). The NSYR includes numerous measures of religiosity that are broadly applicable to popular (i.e., primarily Christian) religion in the United States, including belief in afterlife, belief in angels, belief in demons, belief in God, belief in miracles, belief in judgment day, importance of faith in shaping daily life, making a personal commitment to God, feeling close to God, experiencing an answer to prayer or guidance from God, religious exclusivism, lack of religious doubt, support for proselytization, opposition to religious subjectivism, frequency of service attendance, and frequency of prayer (see Notes 4–8 for variable coding). Exploratory factor analysis indicates that these measures load onto a single factor.<sup>3</sup> Consequently, the first dependent variable, the *overall religiosity scale*, is an additive scale composed of standardized versions of all 16 measures of religiosity (average Cronbach's  $\alpha$  across waves = .920). All dependent variables are standardized to have a mean of zero and a standard deviation of one.

The primary shortcoming of the overall religiosity scale is the obfuscation of distinct dimensions of religiosity. This is particularly important here as previous research suggests that the association between education and religion varies across aspects of religion (e.g., Hill 2011; Schwadel 2011). Consequently, five additional dependent variables are derived from the above 16 religiosity measures. The coding of these variables is guided by theoretical understanding of different features of American religiosity and empirical research on education and religiosity.

First, *frequency of religious service attendance* is unique in that it is both the most widely used measure of religiosity and it has a well-established, positive association with higher education (e.g., Hill 2009; Schwadel 2011).<sup>4</sup> Second, *frequency of prayer*, although a more private behavior, “represents a fundamental aspect of religious life” (Baker 2008:169).<sup>5</sup> Cross-sectional research suggests that prayer, unlike service attendance, has little association with higher education (Baker 2008). Third, the *religious belief scale* is an additive scale composed of standardized measures of belief in the afterlife, angels, demons, God, miracles, and judgment day (average Cronbach's  $\alpha$  = .870).<sup>6</sup> This scale taps commitment to widely held doctrinal beliefs (Wald and Smidt 1993) and employs the same items as Hill's (2011) measure of “Christian super-empiricism.” Higher education is expected to be negatively associated with religious belief (Beckwith 1985; Johnson 1997). Fourth, the *personal religiosity scale* is an additive scale comprised of standardized measures of the importance of faith in shaping daily life, making a personal commitment to God, feeling close to God, and experiencing an answer to prayer or guidance

TABLE 1. Descriptive Statistics

	Mean	Std. dev.	N
Dependent variables			
Overall religiosity scale	.000	1.000	9,348
Frequency of service attendance	.000	1.000	10,242
Frequency of prayer	.000	1.000	10,212
Religious belief scale	.000	1.000	9,902
Personal religiosity scale	.000	1.000	10,047
Religious certainty scale	.000	1.000	9,768
Time-varying (level-1) independent variables			
Bachelor's degree	.091		10,258
In college	.163		10,258
Bachelor's top 50	.010		10,258
Bachelor's 51–100	.016		10,258
Bachelor's other college	.065		10,258
Age <sup>a</sup>	1.949	4.019	10,258
Live with parent(s)	.678		10,258
Cohabit	.053		10,258
Married	.068		10,258
Children	.060		10,258
South	.411		10,258
Time-invariant (level-2) independent variables			
Bachelor's degree	.262		3,289
Mean in college	.139	.196	3,289
Bachelor's top 50	.030		3,289
Bachelor's 51–100	.049		3,289
Bachelor's other college	.183		3,289
Mean age <sup>a</sup>	1.492	2.162	3,289
Parent(s) has bachelor's <sup>b</sup>	.375		3,289
Parent service attendance <sup>b</sup>	4.305	2.188	3,289
Female <sup>b</sup>	.494		3,289
White <sup>b</sup>	.649		3,289
African American <sup>b</sup>	.175		3,289
Latino <sup>b</sup>	.117		3,289
Other race <sup>b</sup>	.052		3,289
Race missing <sup>b</sup>	.006		3,289
Mean live with parent(s)	.718	.243	3,289
Mean cohabit	.048	.123	3,289
Mean married	.060	.135	3,289
Mean children	.054	.116	3,289
Mean South	.420	.479	3,289
Parochial school <sup>c</sup>	.075		3,289
Evangelical Protestant <sup>b</sup>	.317		3,289
Mainline Protestant <sup>b</sup>	.105		3,289

TABLE 1. *Continued*

	Mean	Std. dev.	N
Black Protestant <sup>b</sup>	.122		3,289
Catholic <sup>b</sup>	.248		3,289
Other religion <sup>b</sup>	.064		3,289
Unaffiliated <sup>b</sup>	.122		3,289
Religious tradition unknown <sup>b</sup>	.022		3,289

<sup>a</sup>Age centered so zero is 17 years of age.

<sup>b</sup>From wave 1.

<sup>c</sup>From waves 1 and 2.

from God (average Cronbach's  $\alpha = .841$ ).<sup>7</sup> This scale reflects the experiential or affective dimension of religion (Glock 1962; Idler et al. 2003; Pearce et al. 2013). Finally, the *religious certainty scale* signifies a sectarian worldview that stipulates allegiance to specific religious teachings (Wilson 1982), which along with religious beliefs, constitute the cognitive dimension of religiosity (Pearce et al. 2013). This additive scale is composed of standardized measures of religious exclusivism, lack of religious doubt, support for proselytization, and opposition to religious subjectivism (average Cronbach's  $\alpha = .637$ ).<sup>8</sup> Results for the religious certainty scale should be interpreted with caution because of the marginal reliability of the scale (DeVellis 2012); although a marginal  $\alpha$ , especially with the downward bias associated with noncontinuous items, does not necessarily indicate lack of unidimensionality (see Sijtsma 2009; Liu, Wu, and Zumbo 2010). This is an important aspect of religiosity that shapes social and political perspectives among both adults and adolescents (Trinitapoli 2007; Djupe and Calfano 2013), and it is expected to be negatively associated with higher education (Schwadel 2011).

### Time-Varying (Level-1) Independent Variables

The two primary time-varying education variables assess attending and graduating from college. The first variable is a dummy variable indicating current matriculation at a four-year college or university. The second variable is a dummy variable indicating that the respondent received a bachelor's degree. Ancillary models include measures of quality of degree using the *U.S. News & World Report's* 2014 ranking of national universities. These rankings are intended to reflect qualities associated with both the student population, such as SAT/ACT scores, and the institution, such as reputation; and they have been used in previous research on education and religion (e.g., Hill 2009, 2011). The ancillary models include dummy variables for those who received a bachelor's degree from a top 50, top 51 to 100, or other university or college.<sup>9</sup> The reference group for all higher education variables is those who are not attending or did not graduate from a college or university.

Age is measured in years, centered so that 17 years of age has a value of 0. This zero point was chosen because leaving one's parents' home, and particularly beginning

college, often occur at age 18. Age-squared is included in the models when statistically significant ( $p < .05$ ) to adjust for potential nonlinear effects of aging. The models include controls for five other relevant time-varying factors. A dummy variable indicates whether the respondent currently lives with their parent or parents. Dummy variables for those who are married, cohabiting, and have children control for family formation. A dummy variable for living in the South Census Region controls for geographic variation.

### Time-Invariant (Level-2) Independent Variables

The focal time-invariant variables gauge respondent and parent education. A dummy variable indicates if the respondent received a bachelor's degree in any wave.<sup>10</sup> Person-specific means of the time-varying measure of currently being in college assess aggregate exposure to being in college.<sup>11</sup> A dummy variable indicates if either the respondent's mother or father had a bachelor's degree, as reported by the responding parent in wave 1. Ancillary models include time-invariant dummy variables for receiving a bachelor's degree from a top 50 university, a top 51 to 100 university, and another college or university.

Several time-invariant control variables are included in the models. A dummy variable for female respondents and dummy variables for African American, Latino, and other race respondents control for sex and race. Dummy variables for religious tradition in wave 1 (Steensland et al. 2000), a dummy variable for parochial school attendance in wave 1 or 2, and responding parent's frequency of religious service attendance in wave 1 control for type of religious exposure in adolescence.<sup>12</sup> The means of age, living with parents, southern residence, children, married, and cohabiting are included to improve the estimates of corresponding time-varying variables (Raudenbush and Bryk 2002; Singer and Willett 2003). Additional dummy variables indicate missing data on respondent's race ( $N = 20$ ) and unknown religious tradition at wave 1 ( $N = 74$ ).

## RESULTS

### Within- and Between-Person Effects of Higher Education

Results from multilevel models of the six religiosity measures are reported in Table 2. Adding the four education variables to the models improves the model fit (i.e., significantly reduces deviance statistic) for each model except the personal religiosity scale model. In the overall religiosity scale model, the time-varying measure of earning a bachelor's degree has a negative effect on religiosity ( $b = -.120$ ,  $p < .01$ ). Each of the dependent variables is standardized. Thus, *ceteris paribus*, respondents decline .12 standard deviations on the overall religiosity scale when they graduate from college. The time-varying measure of currently being in college does not have a meaningful effect ( $b = -.042$ , n.s.). The negative effect of bachelor's degree, however, lends support to the argument that higher education promotes within-person declines in religiosity. Time-varying age has a strong, negative effect—overall religiosity declines sharply during

adolescence but then stabilizes at about age 25. This finding aligns with research on religion and aging (e.g., Hayward and Krause 2013), which suggests that religiosity—especially participation—declines when adolescents leave their parents' home but then increases when they form their own families. Time-varying control variables indicate that getting married and having children have positive effects on within-person changes in overall religiosity (control variable results available on request).

The remaining models in Table 2 show that the effects of (time-varying) education on within-person change vary across indicators of religiosity. In order of increasing magnitude, bachelor's degree negatively affects within-person change in frequency of prayer ( $b = -.102, p < .05$ ), the religious certainty scale ( $b = -.126, p < .01$ ),<sup>13</sup> and the religious belief scale ( $b = -.152, p < .001$ ). Bachelor's degree has a larger effect than other time-varying variables except for age in the models of religious belief and certainty. Perhaps this should not be surprising as these measures constitute the cognitive dimension of religiosity (Pearce et al. 2013). Currently being in college has a moderate, negative effect on prayer ( $b = -.075, p < .01$ ) but is unrelated to the other measures of religiosity. Higher education does not meaningfully affect within-person change in service attendance or the personal religiosity scale. These results highlight the variable relationship between higher education and religiosity. Graduating from college is associated with declines in some but not all measured aspects of religiosity.

The time-invariant measures indicate that, *ceteris paribus*, college graduates are not any less religious than the noncollege-educated. Despite within-person declines in overall religiosity associated with graduating from college, there is no meaningful difference in overall religiosity between those who do and do not graduate from college ( $b = .060, n.s.$ ). None of the time-invariant measures of respondent education are negatively associated with religiosity. Moreover, attending ( $b = .240, p < .01$ ) and graduating ( $b = .077, p < .05$ ) from college are positively associated with between-person differences in service attendance. In other words, when aggregating across the four waves of data, those who graduate from college are as or more religious than those who do not graduate from college. This may appear counterintuitive given the negative effects of college graduation on within-person changes in several dimensions of religiosity. Nonetheless, this fits a pattern where relatively religious youth are disproportionately likely to attend college, which comports with extant research (e.g., Glanville et al. 2008) as well as the NSYR data.<sup>14</sup> Within-person declines in religiosity associated with graduating from college are thus negated by the selection of relatively religious youth into college, leading to little difference in aggregate (person-level) religiosity between the college and noncollege educated.

In contrast to respondent education, parents' education is negatively associated with between-person differences in religiosity. Specifically, parents' education has a negative effect in the models of the overall religiosity scale ( $b = -.094, p < .01$ ), frequency of prayer ( $b = -.119, p < .001$ ), the religious belief scale ( $b = -.129, p < .001$ ), and the personal religiosity scale ( $b = -.105, p < .001$ ). Comparing between respondents, it is the children of the highly educated rather than the college-educated themselves who report relatively low levels of religiosity. It is important to remember that the data are

TABLE 2. Focal Results from Multilevel Growth Models of Religiosity with Time-Invariant and Time-Varying Covariates

	Overall religiosity scale		Frequency of service attendance		Frequency of prayer		Religious belief scale		Personal religiosity scale		Religious certainty scale	
	b	se	b	se	b	se	b	se	b	se	b	se
Intercept	.001	.014	.009	.012	.014	.015	.002	.015	.016	.014	-.003	.014
Time varying												
Bachelor's degree	-.120	.038**	-.003	.040	-.102	.041*	-.152	.040***	-.077	.040	-.126	.041**
In college	-.042	.022	.000	.027	-.075	.025**	-.034	.025	-.011	.025	-.041	.028
Age	-.048	.004***	-.090	.005***	-.034	.005***	-.019	.004***	-.056	.005***	-.043	.005***
Age-squared <sup>a</sup>	.022	.005***	.042	.006***	.029	.006***			.033	.005***	.027	.006***
Time invariant												
Bachelor's degree	.060	.041	.077	.034*	.060	.041	.010	.044	.054	.039	.093	.038*
Mean in college	.099	.091	.240	.079**	.041	.094	.111	.099	.100	.086	.076	.086
Parent bachelor's	-.094	.031**	-.001	.027	-.119	.034***	-.129	.034***	-.105	.031***	-.039	.031

TABLE 2. Continued

	Overall religiosity scale		Frequency of service attendance		Frequency of prayer		Religious belief scale		Personal religiosity scale		Religious certainty scale	
	b	se	b	se	b	se	b	se	b	se	b	se
Variance component												
Intercept	.4088***		.2411***		.3949***		.4500***		.3656***		.3390***	
Age	.0069***		.0085***		.0044***		.0051***		.0057***		.0067***	
Age-squared <sup>a</sup>	.0003***		.0004***		.0001***				.0003***		.0003***	
Level 1	.1783		.3430		.3419		.2541		.2772		.3246	
Deviance	18,475 <sup>b</sup>		23,227 <sup>b</sup>		23,854 <sup>b</sup>		21,826 <sup>b</sup>		22,116		22,415 <sup>b</sup>	
Level-1 N	9,348		10,242		10,212		9,902		10,047		9,768	

<sup>a</sup>Coefficient, standard error, and variance component multiplied by 10.

<sup>b</sup>The addition of bachelor's degree and in college variables (time-varying and time-invariant) improve the model fit,  $p < .001$ .

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (two-tailed test).

Notes: Models include the following time-varying covariates: live with parents, married, cohabit, children, and South; models include the following time-invariant covariates: sex, race, religious tradition at wave 1, parochial school attendance, frequency of parent service attendance at wave 1, mean of age, mean of age-squared (except in belief scale model), mean live with parents, mean South, mean children, mean married, and mean cohabit.

b = beta; se = standard error.

limited to those less than 30 years old. It is possible that the trajectories of religiosity for the college and noncollege educated may differ as they continue to age, form families, choose careers, and potentially diverge in various ways that may be associated with higher education. Nonetheless, at this stage of the life course, the college-educated are no less religious than the noncollege-educated,<sup>15</sup> and the evidence suggests that during adolescence those who eventually went to college were more religious than those who did not. Overall, the results in Table 2 suggest that both parent and respondent education influence religiosity. At this stage of the life course, the children of highly educated parents are relatively irreligious, and college graduation is associated with declines in several aspects of religiosity.

### College Ranking

Table 3 reports results from models that include measures of college ranking. The overall religiosity scale model indicates that graduating from a top 51 to 100 ranked university ( $b = -.146$ ,  $p < .05$ ) and a nontop 100 rated college or university ( $b = -.117$ ,  $p < .01$ ) are both associated with within-person declines in religiosity. Across the models, the negative effects of (time-varying) higher education on within-person changes in religiosity are most consistently found among those who graduate from nontop 100 institutions. In addition to the overall religiosity scale, graduating from a nontop 100 college or university negatively affects within-person change in prayer ( $b = -.097$ ,  $p < .05$ ), religious belief ( $b = -.155$ ,  $p < .001$ ), and religious certainty ( $b = -.142$ ,  $p < .001$ ). The only significant within-person effect of graduating from a top 50 university is the large, negative effect on frequency of prayer ( $b = -.199$ ,  $p < .05$ ). These findings suggest that declines in religiosity associated with higher education are disproportionately the result of graduation from nonelite universities.

The time-invariant measures show that graduating from a nontop 100 college or university ( $b = .102$ ,  $p < .05$ ), but not from a top 100 school, is positively associated with between-person differences in overall religiosity. The positive association between bachelor's degree from a nontop 100 school and between-person differences in religiosity is evident in all the models except the model of religious belief. Graduating from a top 50 university, on the other hand, is strongly and negatively associated with between-person differences in belief ( $b = -.256$ ,  $p < .01$ ); and is close to being significantly and negatively associated with between-person differences in overall religiosity ( $b = -.162$ ,  $p = .055$ ). Despite within-person declines in religiosity associated with graduating from a nontop 100 university, those who graduate from such institutions appear to be the most religious at the aggregate, even compared to those who do not graduate from college. As I discuss in greater detail below, this suggests that relatively religious youth self-select into nontop 100 universities. The NSYR data support this conclusion: the mean of the overall religiosity scale in wave 1 (i.e., before college age) is .308 for those who eventually graduate from nontop 100 universities, .156 for those who never graduate from college,  $-.202$  for those who eventually graduate from top 50 schools, and .234 those who eventually graduate from top 51 to 100 schools ( $F = 10.426$ ,  $p < .001$ ). These results indicate that the most religious adolescents are disproportionately likely to

attend nontop 100 universities, and those who attend such institutions are relatively likely to decline in their religiosity.

## DISCUSSION

Social scientists have often argued that higher education and other fundamental features of modernity are incompatible with traditional forms of religion. Influential social theorists who opposed organized religion, such as Freud ([1927]1964) and Comte ([1865]2009), extolled the aspects of modernity that they believed promoted secularity. Even those who were not uniformly opposed to religion, such as Simmel (1997), argued that theoretical knowledge of transcendental realities is suspect in the cultural and social atmosphere of modernity. More recent research, such as that on “culture wars” in the United States (Hunter 1991), similarly suggests that secular higher education is incompatible with traditional conceptions of morality. According to Johnson (1997:242), “the relationship between education and religious belief is generally best represented by the image of erosion.” The above results partially support this depiction of higher education leading to reduced religiosity.

Specifically, obtaining a bachelor’s degree has a negative effect on within-person changes in religious belief, frequency of prayer, religious certainty, and the overall religiosity scale. While the influence of omitted variables on these findings cannot be dismissed, the results nonetheless suggest that higher education has a *potentially causal* effect on declines in religious belief, prayer, and religious certainty. This comports with the notion that the social, cultural, and curricular content of higher education is antithetical to traditional religious beliefs (e.g., Johnson 1997; Sherkat 1998). The emphasis on empirically verifiable knowledge and the scientific worldview in higher education (Miller 1967; Cherry et al. 2001) may conflict with some religious beliefs and the view that a single belief system is true while others are false. College education furthers scientific knowledge (Evans 2009), which can lead people to question core religious tenets. Diversity in contemporary universities, in both social environments and curricular content (Balswick et al. 1975; Moiseyenko 2005), as well as the heterogeneity of social networks among the highly educated (Marsden 1987; McPherson et al. 2001) may promote more relativistic views that conflict with exclusivist religious perspectives (Putnam and Campbell 2010).

These findings partially comport with previous empirical research on the topic, but also provide important new insights. Hill’s (2011) analysis of changes in religiosity is the most relevant comparison given his similar focus and use of NSYR data. Hill finds that attending and graduating from college, and especially elite schools, is negatively associated with changes in “Christian super-empiricism” and positively associated with the view that it is “okay to pick and choose beliefs.” The former measure is similar to the belief scale in the above analysis, and the latter is a (reverse coded) component of the religious certainty scale. While our conclusions on both indicators are similar with respect to the effects of college graduation, the above results show no effect of being in college on either religious belief or certainty. This difference is potentially related to

TABLE 3. Focal Results from Multilevel Growth Models of Religiosity with Time-Invariant and Time-Varying College Ranking Variables

	Overall religiosity scale		Frequency of service attendance		Frequency of prayer		Religious belief scale		Personal religiosity scale		Religious certainty scale	
	b	se	b	se	b	se	b	se	b	se	b	se
Intercept	.001	.014	.009	.012	.014	.015	.002	.015	.016	.014	-.003	.014
Time varying												
Bachelor's—top 50	-.099	.087	-.097	.085	-.199	.083*	-.185	.103	-.063	.084	-.011	.090
Bachelor's—51–100	-.146	.066*	.032	.066	-.079	.072	-.159	.081*	-.126	.064*	-.130	.073
Bachelor's—other	-.117	.043**	-.000	.046	-.097	.045*	-.155	.044***	-.061	.046	-.142	.045**
In college	-.043	.022	-.000	.027	-.075	.025**	-.037	.025	-.010	.025	-.042	.028
Age	-.048	.004***	-.090	.005***	-.034	.005***	-.019	.004***	-.056	.005***	-.043	.005***
Age-squared <sup>a</sup>	.022	.005***	.042	.006***	.029	.006***			.033	.005***	.026	.006***
Time invariant												
Bachelor's—top 50	-.162	.084	-.061	.067	-.074	.088	-.256	.096**	-.127	.077	-.114	.083
Bachelor's—51–100	.017	.083	.020	.061	.013	.085	-.002	.083	-.010	.079	.068	.077
Bachelor's—other	.102	.042*	.109	.036**	.089	.043*	.048	.046	.094	.040*	.127	.040***
Mean in college	.105	.091	.245	.078**	.046	.095	.115	.099	.106	.086	.081	.086
Parent bachelor's	-.084	.031**	.006	.027	-.113	.034***	-.120	.034***	-.096	.032**	-.030	.031

TABLE 3. Continued

	Overall religiosity scale		Frequency of service attendance		Frequency of prayer		Religious belief scale		Personal religiosity scale		Religious certainty scale	
	b	se	b	se	b	se	b	se	b	se	b	se
Variance component												
Intercept	.4058***		.2397***		.3939***		.4467***		.3634***		.3373***	
Age	.0069***		.0085***		.0044***		.0051***		.0057***		.0067***	
Age-squared <sup>a</sup>	.0003***		.0004***		.0001***				.0002***		.0003**	
Level 1	.1783		.3429		.3418		.2540		.2773		.3245	
Deviance	18,457 <sup>b</sup>		23,215 <sup>b</sup>		23,847 <sup>b</sup>		21,807 <sup>b</sup>		22,103 <sup>b</sup>		22,398 <sup>b</sup>	
Level-1 N	9,348		10,242		10,212		9,902		10,047		9,768	

<sup>a</sup>Coefficient, standard error, and variance component multiplied by 10.

<sup>b</sup>The addition of bachelor's degree and in college variables (time-varying and time-invariant) improve the model fit,  $p < .001$ .

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$  (two-tailed test).

Notes: Models include the following time-varying covariates: live with parents, married, cohabit, children, and South; models include the following time-invariant covariates: sex, race, religious tradition at wave 1, parochial school attendance, frequency of parent service attendance at wave 1, mean of age, mean of age-squared (except in belief scale model), mean live with parents, mean South, mean children, mean married, and mean cohabit. b=beta; se=standard error.

Hill's use of only waves 1 and 3 of the NSYR data, which exclude information on the 16 percent of respondents who were attending college in wave 2. Even more important, Hill lacked access to wave 4 as it had not yet been collected. The timespan between waves 3 and 4 is similar to the timespan between waves 1 and 3 (approximately five to six years), which means a far longer portion of the life course is included in the above analyses. Hill's models also do not include key covariates included here, particularly the family formation measures that are strongly associated with religiosity. Possibly most important, the analyses here expand on Hill's work and other previous research by simultaneously modeling both within- and between-person effects.

Indeed, the distinction between within-person and between-person effects provides important insights into the association between education and religiosity; insights that suggest both that more religious youth self-select into higher education, and that higher education leads to religious decline. On the one hand, within-person declines in religiosity associated with higher education do not equate to differences between people. For instance, graduating from college negatively affects within-person change in religious belief and prayer, but the college-educated are not less likely than those without a bachelor's degree to pray or believe. On the other hand, there are between-person differences in religiosity associated with higher education where no within-person change takes place. Specifically, the college-educated attend religious services more often than the noncollege-educated, but there is no within-person change in attendance associated with attending or graduating from college. Both of these patterns can be explained by the selection of relatively religious youth into college.

Higher education does not appear to have a causal effect on religious service attendance. Instead, those who attend services more often are also more likely to go to college. This may be in part because of the association between adolescent religious participation and both extracurricular activities and social networks conducive to positive educational outcomes (Glanville et al. 2008). Conversely, higher education does appear to have a negative, causal effect on several other aspects of religiosity. There is little between-person difference on these measures of religiosity because the within-person declines are at least partially negated by the higher religiosity of college attendees to begin with. Of course, this may change as they continue to age. Although previous research on the topic has sometimes sought to control for selection effects, the patterns of selection into higher education and the influence of higher education only become clear once within- and between-person effects are distinguished from one another.

By separating within- and between-person effects, the above analysis not only highlights selection effects but also furthers understanding of the complex relationship between education and religiosity. For instance, researchers have attributed the positive association between education and service attendance to skills and an organizational orientation attained in higher education that in turn promote religious participation (e.g., Verba et al. 1995; Sacerdote and Glaeser 2001). In contrast, the results here suggest that frequent service attenders are relatively likely to go to college, and, unlike some other aspects of religiosity, higher education does not cause declines in service attendance. The above results also indicate that higher education has an intergenerational

influence on religiosity: graduating from college is associated with within-person declines in religious belief and prayer, and those with highly educated parents are disproportionately irreligious. Given the association between parent and child education (Reisel 2011), these findings suggest that the negative effects of higher education on religiosity are compounded for many college-educated Americans who also have college-educated parents.

Finally, the results highlight the importance of type of institution. In regard to elite universities, the findings support Wuthnow and Mellinger's (1978) argument that relatively irreligious students are disproportionately likely to attend elite universities. In contrast to elite universities, nonelite colleges and universities are especially likely to attract more religious youth. Graduates of nonelite institutions report even higher levels of religiosity than the noncollege-educated, yet they are also relatively likely to decline in their religiosity. That they remain relatively religious despite the likelihood of decline suggests that nonelite institutions provide ample opportunities to maintain student religiosity (Wolfe 2006).<sup>16</sup> Overall, these results indicate that much of the relationship between higher education and religiosity is due to religious youth choosing to attend nonelite universities and those who doubt mainstream religious beliefs choosing to attend elite universities. While a likely source of spuriousness was controlled for in the form of parents' education, other omitted variables associated with both religiosity and graduation from elite and nonelite universities may affect these findings.

## LIMITATIONS

Although the findings in this article do much to expand understanding of the potentially causal and noncausal associations between higher education and religiosity, there are noteworthy limitations to the analysis. Perhaps most important, there is little ability to assess the reasons why those who graduate from college are relatively likely to decline in their religiosity. Qualitative research could expand on the findings described above by providing insight into college graduates' perceptions of how religious beliefs relate to various aspects of the college experience. Large differences between graduates of elite and nonelite universities demonstrate that there is also considerable variation in the impact of higher education on religiosity. Even within a single institution, students' experiences vary tremendously. Future quantitative research can expand on the above findings by further examining the aspects of higher education that cause declines in religiosity, particularly in the cognitive dimensions of religiosity. For instance, do declines in belief differ by choice of major, by types of social networks in college, or by exposure to other higher education-related phenomena such as campus religious groups or the presence of congregations on campus?

The analyses in this article are also limited by the age range of the NSYR respondents. The findings are only generalizable to Americans in their teens and twenties. It is possible that these effects will change as people age. Do the college-educated and noncollege-educated differ in similar ways at age 29 and age 49? Are other effects of education only evident later in life as higher education continues to influence major life

decisions such as family formation? The incomes and types of occupations that are associated with higher education also promote more heterogeneous social networks (McPherson et al. 2001), which could lead to additional indirect effects of education on changes in religiosity throughout the adult life course.

As with longitudinal research more generally, there is the problem of attrition. More than one-third of respondents to the wave 1 survey could not be located for the wave 4 survey. These respondents are disproportionately likely to be coded as nongraduates in the above analysis because they were only interviewed at younger ages. Limiting the analysis to those who completed the wave 4 survey, however, does not meaningfully influence the focal results (results available on request). Nonetheless, attrited respondents are relatively likely to be racial minorities, to rarely attend religious services, and to have less-educated parents. Future research should assess whether the effects of education on religiosity differ along these dimensions.

The measurement of religiosity is another important limitation. While the NSYR survey includes numerous measures of religiosity, many of these, especially the belief indicators, are specific to the Christian religion and potentially even more narrowly to the Protestant tradition. Measures such as frequency of religious service attendance and prayer are more broadly applicable. Even those measures, however, may fail to pick up alternative forms of religiosity, particularly in the context of religious deinstitutionalization and the emphasis on spirituality as distinct from, although not necessarily opposed to, religiosity (Marler and Hadaway 2002). More individualized measures, such as those that emphasize the strength of religious convictions regardless of what those convictions are, may show different patterns (Lee 2002).

Finally, the sources of the selection effects require elucidation. Although the above models control for religious exposure in adolescence, future research can build on these results by exploring the moderating impact of religious origins on trajectories of religiosity for the college- and noncollege-educated. For instance, additional analyses using NSYR data suggest that college graduation promotes declines in religious belief primarily among those who were relatively religious as adolescents, and that college graduation leads to declines in frequency of prayer largely among those who were less religious when they were adolescents (results not shown).<sup>17</sup> Cognitive differences could also be relevant as more intelligent people self-select into higher education, and intelligence may lead to declines in religiosity (Zuckerman, Silberman, and Hall 2013; Ganzach and Gotlibovski 2014). The selection of more intelligent people into elite universities in particular may help explain why those who graduate from such institutions have particularly low levels of religious belief.

## CONCLUSIONS

The relationship between higher education and religiosity in some ways fits the popular depiction of universities as faith killers. Conforming to this portrayal, graduating from college is associated with declines in prayer, religious certainty, and especially religious belief during emerging adulthood. In this way, universities appear to be secularizing

institutions. Other aspects of religiosity, however, are unaffected by college attendance and graduation, and the highly educated are relatively likely to attend religious services. These results suggest that church pews are now disproportionately filled with college-educated young adults, many of who question key religious beliefs. This comports with a long tradition of sociological research (e.g., Fukuyama 1961; Roof 1976) that emphasizes that college students, and the college-educated more generally, often compartmentalize religion to weekend services and holidays (for more recent examples, see Campbell 2005; Clydesdale 2007).

This article attempts to address a complaint Roof (1976:198) voiced 40 years ago: “Though education is often cited as a correlate, seldom do researchers fully explain why, or exactly how, it affects religious commitment.” While much remains to be answered in terms of “why,” it is clear that the selection of relatively religious youth into higher education, and relatively irreligious youth into elite universities, plays a role. In regard to “how,” higher education has a negative effect on changes in religious belief, certainty, and prayer; and it has a positive association with religious participation. These results extend understanding of the potentially causal and noncausal associations between higher education and different aspects of religiosity. Three clear implications of this research are: (1) religiosity should not be treated as a unidimensional phenomenon, (2) emerging adults who attend and graduate from college are relatively likely to exhibit declines in religiosity, and (3) those who frequently attend religious services are relatively likely to attend college, not vice versa.

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## NOTES

<sup>1</sup>The full sample for wave 1 consists of 3,370 respondents. The 80 respondents (in wave 1) who comprise the Jewish oversample are deleted from each wave because the Jewish oversample is not a random sample and those cases cannot be weighted along with the other cases. The sample sizes reported above do not include the Jewish oversample.

<sup>2</sup>In wave 4, four respondents reported being 31 or 32 years of age, which is outside of the range of possible ages given respondents' ages in wave 1. Consequently, age for these four respondents was recoded to 29, the oldest possible age.

<sup>3</sup>Because of the ordinal nature of most of the variables, the *factormat* option in Stata was used to perform an exploratory factor analysis on the polychoric correlation matrix. All measures loaded at .41 or higher on a single factor (.63 or higher for all measures other than support for proselytization [.56] and opposition to religious subjectivism [.41]). No other factor had multiple variables reaching the basic threshold of .40 (Costello and Osborne 2005).

<sup>4</sup>Frequency of religious service attendance is a seven-category measure ranging from “never” to “more than once a week.”

<sup>5</sup>Frequency of prayer is a seven-category measure ranging from “never” to “many times a day.”

<sup>6</sup>Belief in afterlife, angels, demons, and miracles each coded as follows: (1) not at all, (2) maybe, and (3) definitely. Belief in God is coded (1) no, (2) unsure/do not know, and (3) yes. Respondents who believe in God were asked “Do you believe that there will come a judgment day when God will reward some and punish others?” In wave 4, an “unsure” response option was added. Those who answered no, unsure/do not know, or do not believe in God are coded zero and those who answered yes are coded one.

<sup>7</sup>Importance of faith is based on the survey question “How important or unimportant is religious faith in shaping how you live your daily life?” The five-category variable ranges from “not at all important” to “extremely important.” In the first wave respondents were asked (1) if they had ever made a personal commitment to live their life for God and (2) if they experienced a definite answer to prayer or specific guidance from God. In later waves, respondents were asked if they had done or experienced these things in the time since the previous survey. In wave 4, a “maybe” response option was added. For both commitment to God and having a prayer answered/guidance from God, those who responded no or maybe are coded zero and those who answered yes are coded one. Finally, respondents were asked “How distant or close do you feel to God most of the time?” The six-category variable ranges from “extremely distant” to “extremely close.” In wave 4, a “does not apply” response category was added. Respondents who do not believe in God, and were thus not asked the question, and those who responded “does not apply” are coded as extremely distant.

<sup>8</sup>Exclusivist religious perspectives are coded as follows: (1) there is very little truth in any religion, (2) many religions may be true, and (3) only one religion is true. Respondents with a religion were asked, “In the past year, how many doubts, if any, have you had about whether your religious beliefs are true?” Response options are, many doubts, some doubts, a few doubts, and no doubts. In wave 4, a “does not apply” response category was added. Does not apply and those with no religion are coded as having many doubts. Support for proselytization contrasts those who say it is “okay for religious people to try to convert other people to their faith” with those who believe “everyone [should] leave everyone else alone.” Last, opposition to religious subjectivism (Hart 1987) is based on disagreement with the following statement: “Some people think that it is okay to pick and choose their religious beliefs without having to accept the teachings of their religious faith as a whole. Do you agree or disagree that this is okay?”

<sup>9</sup>Based on rankings of “national” universities. Wave 2 of the NSYR does not include IPEDS (Integrated Postsecondary Education Data System) codes, which indicate the specific college attending and/or graduated from. Only three respondents had bachelor’s degrees in wave 2, which means ranking of institutions granting the bachelor’s degree is not very relevant in wave 2. Nonetheless, 416 respondents to the wave 2 survey were currently in college. This would cause a high level of missingness for a variable indicating ranking of college or university currently enrolled in. Consequently, no such variable is included in the models. Eleven respondents received degrees from more than one four-year college or university. The college rank variables reflect the highest ranked university from which these respondents earned a bachelor’s degree.

<sup>10</sup>The multilevel modeling literature (e.g., Raudenbush and Bryk 2002), and particularly the literature on using multilevel models to examine change within individuals (Singer and Willett 2003), suggests including the mean of time-varying (i.e., level-1) variables as time-invariant variables (i.e., level-2) to assure that the time-varying measures assess change within individuals. I use a dummy variable indicating ever receiving a bachelor’s degree rather than the mean across waves because the substantively relevant distinction is between those who do and do not graduate from college. Using the mean instead of a dummy variable would give more weight to those

who graduated in an earlier wave. Nonetheless, the results are not meaningfully different when using the mean of time-varying bachelor's degree as the time-invariant measure rather than the dummy variable employed in this article.

<sup>11</sup>The time-invariant dummy variable for college graduation and the time-invariant mean of being in college must be correlated because those who never went to college have a value of 0 on both variables, and, conversely, graduating from college requires spending time in college (although there is a large enough gap between waves 3 and 4 for respondents to attend and graduate between waves; thus, 6 percent of respondents who were never in college at the time of a survey did graduate from college). The polychoric correlation ( $\rho$ ) between these two variables is .692. The time-invariant measures of bachelor's degree and mean in college are thus indeed relatively highly correlated, although no more so than is generally acceptable in multiple regression (Tabachnick and Fidell 2012). Alternative analyses that drop the mean of in college show similar results. Specifically, the focal results for attendance, prayer, the belief scale, the personal religiosity scale, and the religious certainty scale are unchanged. The only meaningful changes concern the overall religiosity scale. When the mean of in college is excluded from the model of the overall religiosity scale, the time-varying (level-1) in college variable has a moderate, negative effect ( $p < .05$ ), indicating within person decline associated with being in college, and the time-invariant (level-2) bachelor's degree variable has a moderate, positive effect ( $p < .05$ ), which indicates differences between college graduates and those without a bachelor's degree. Results from analyses without the mean of in college available on request.

<sup>12</sup>Four cases are missing data on parent service attendance. For these respondents, parent service attendance is coded at the mean.

<sup>13</sup>Given the marginal reliability of the religious certainty scale, separate models for each of the individual items that constitute the scale were analyzed (results not shown). The results from those models indicate that time-varying bachelors' degree has a negative effect on within-person changes in religious exclusivism and opposition to religious subjectivism, but not on support for proselytization and lack of religious doubt (results available on request).

<sup>14</sup>For instance, the mean overall religiosity score in wave 1 is .237 for those who eventually graduate from college and .156 for those who do not ( $t = 2.234, p < .05$ ).

<sup>15</sup>This finding of relatively little between-person difference in religiosity associated with higher education also holds when focusing specifically on those who are past the traditional college age range. For instance, limiting the sample to wave 4 and examining ordinary least squares (OLS) models of religiosity shows that bachelor's degree is positively associated with religious service attendance but not significantly associated with the other measures of religiosity (models control for sex, race, region, married, cohabit, live with parents, children, and age).

<sup>16</sup>For instance, in wave 4, the mean overall religiosity scale for graduates of nontop 100 institutions is .145 standard deviations higher than for graduates of top 51 to 100 institutions, and .703 standard deviations higher than for graduates of top 50 institutions.

<sup>17</sup>I examined models of religiosity separately for those in the top 50 percent and the bottom 50 percent of the overall religiosity scale in wave 1. The models are identical to those in Table 2 with the exception of splitting the sample by wave 1 religiosity. Results show that time-varying bachelor's degree has a strong, negative effect on the belief scale for those who were relatively religious in wave 1 ( $b = -.158, p < .001$ ) but no effect for those who were less religious in wave 1. Conversely, time-varying college graduation ( $b = -.198, p < .001$ ) and in college ( $b = -.107, p < .01$ ) are associated with robust declines in frequency of prayer for those who were less religious in wave 1 but not for those who were more religious in wave 1. Another interesting finding

from this analysis is that the negative effect of parent education on between-person differences in religiosity is limited to those who were less religious in wave 1. Results of this auxiliary analysis are available on request.

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