

# The Varieties of Religious Development in Adulthood: A Longitudinal Investigation of Religion and Rational Choice

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The authors used growth mixture models to study religious development during adulthood (ages 27–80) in a sample of individuals who were identified during childhood as intellectually gifted. The authors identified 3 discrete trajectories of religious development: (a) 40% of participants belonged to a trajectory class characterized by increases in religiousness until midlife and declines in later adulthood; (b) 41% of participants belonged to a trajectory class characterized by very low religiousness in early adulthood and age-related decline; and (c) 19% of participants belonged to a trajectory class characterized by high religiousness in early adulthood and age-related increases. Gender, strength of religious upbringing, number of children, marrying, and agreeableness predicted membership in the trajectory classes. Results were largely consistent with the rational choice theory of religious involvement.

*Keywords:* religion, development, growth mixture models, longitudinal

How do people's religious commitments, behaviors, and identities change as they pass through adulthood? Just as psychologists have studied the stability of personality over the adult life course (e.g., Bloom, 1964; Helson, Jones, & Kwan, 2002; Roberts & DelVecchio, 2000; Roberts, Helson, & Kohnen, 2002), social scientists have been interested in religious change and stability for decades (Bahr, 1970; Fowler, 1981; Hites, 1965; Ingersoll-Dayton, Krause, & Morgan, 2002). Religiousness is quite stable in a rank-order sense (test–retest correlations have ranged from .40 to .70 over 10-, 20-, 30-, and even 40-year intervals during adulthood; Idler & Kasl, 1997; Lubinski, Schmidt, & Benbow, 1996; Wink & Dillon, 2001), but many adults' absolute levels of religiousness also change over the life course.

Longitudinal studies show that adults in the United States generally become more religious as they age (Argue, Johnson, & White, 1999; Miller & Nakamura, 1996), even though these age-

related increases are often punctuated by (a) temporary increases in religiousness following marriage and child rearing (Ingersoll-Dayton et al., 2002; Stolzenberg, Blair-Loy, & Waite, 1995); (b) reductions in religiousness following family transitions such as divorce, the entry of children into adolescence, or the departure of children from their parents' home (Ingersoll-Dayton et al., 2002; Sherkat, 1998; Stolzenberg et al., 1995); (c) declines in religiousness following declines in health (Kelley-Moore & Ferraro, 2001); and (d) temporary increases in religiousness after the death of a spouse (Brown, Nesse, House, & Utz, 2004).

However, the general trend for people to become more religious as they proceed from early to late adulthood can hardly be considered a human universal. In Japan, for example, the effects of aging on religiousness are even more marked than they are in the United States, but in the Netherlands, they appear to be negligible (Sasaki & Suzuki, 1987). Moreover, in at least one sample of adults from the United States—adults from the Oakland, California, area who were followed from their 30s to their mid-70s—religiousness actually declined as people entered their 50s and 60s, only to rise again as people entered their 70s (Wink & Dillon, 2001).

The diversity across populations in the typical trajectory of religious development during adulthood implies that several religious trajectories over the adult life course may exist within populations as well, and qualitative studies show that people perceive themselves to experience qualitatively distinct trajectories of religious development (Ingersoll-Dayton et al., 2002). In other words, the search for a single trajectory of religious development over the adult life course may be misguided because several trajectories can hypothetically exist in any population. Theoretical work on religious development might be greatly enriched by empirical studies that identify discrete courses of religious devel-

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opment within a given population, especially if those studies also reveal characteristics of individuals or their social backgrounds that account for why some people are more likely to follow particular pathways of religious development (Brennan & Mroczek, 2002; Reich, 1992).

### Religiousness Across the Life Course and Discrete Pathways of Development

Longitudinal studies of the development of religiousness over the life course have been rare, and none of which we are aware have applied modern statistical methods for studying interindividual differences in intraindividual development (e.g., see Brennan & Mroczek, 2002). Modern methods such as growth curve models that use a multilevel approach to conceptualizing growth and change (e.g., Hedeker, 2004; Raudenbush & Bryk, 2002) can be a useful start for understanding the life course trajectories of religious development, but in traditional growth curve models, longitudinal change for every individual is conceptualized with the same growth form (e.g., an initial level of a construct and, perhaps, some degree of linear or quadratic change in the construct over time), and individuals are assumed to differ around a typical trajectory (i.e., some individuals have higher initial values than others, some experience more linear change than others, etc.). In other words, by merely attempting to describe the “typical” form of growth, along with individuals’ variation from that typical form of growth, such methods necessarily smooth over qualitative differences in development.

A recently developed extension of traditional growth curve modeling called growth mixture modeling rests on the assumption that individual development might reflect membership in one of several discrete classes of developmental trajectories rather than parametric differences among individuals belonging to a single trajectory class (Muthén, 2003; Muthén et al., 2002). These models, which are essentially a marriage of latent growth modeling and latent class modeling, enable researchers to examine whether multiple pathways of development underlie the between-persons differences in religious development over the life course. People who are classified as belonging to a single trajectory class can be thought of as individuals who “took the same path” of development, even though heterogeneity in development is also permitted by allowing individual trajectory components to vary within each trajectory class. Having established these qualitatively distinct trajectory classes (insofar as they exist), we can predict trajectory class membership on the basis of background variables. Such models could be most helpful for identifying the varieties of religious development.

### Trajectories of Religious Development as Lifelong Patterns of Cultural Consumption

Which factors would determine whether an individual follows a specific pathway of development over the other possible pathways? Rational choice theory (e.g., Finke & Stark, 1992; Sherkat & Wilson, 1995; Stark & Finke, 2000)—called the “new paradigm” in the sociology of religion (Sherkat & Wilson, 1995; Warner, 1993)—is an interesting model for guiding predictions. Even though rational decision making is often overshadowed by nonrational processes (e.g., Kahneman, 2003; Lerner & Keltner,

2001), rational choice is useful for understanding many aspects of human behavior, religiousness included. C. Smith (2003) observed that rational choice theory, along with evolutionary psychology, predominates current social-scientific accounts of human behavior—religion in particular. This is especially true of the study of religion in the United States, where religiousness is generally high and people experience a freedom to choose among many religious options (including none at all), but it applies to religion in other nations as well (for review, see Finke & Stark, 2003).

The fundamental tenet of rational choice theory is that people make rational choices that are consistent with their preferences and tastes insofar as the available information, their ability to understand that information, and external constraints on their choices permit it. Rational choice theory has been notably influential in the field of economics (Iannaccone, 1998); thus applying rational choice theory to religion inexorably leads one to conceptualize religion as a cultural product or commodity (e.g., a set of ideas, beliefs, behaviors, rituals, institutions, and social networks), and a trajectory of religious development during adulthood as a temporal pattern of consumption (e.g., attending services, thinking about God, praying, reading scripture or other religious literature, and purchasing tangible religious goods) of this product. Some people may consistently consume high levels of religion throughout adulthood, others may eschew the product entirely, and still others may consume high levels of the product only at certain points in their lives, thereby manifesting a fluctuating consumption pattern. Thus, in light of rational choice theory, explaining why people belong to certain religious trajectory classes is a matter of discovering the determinants of lifelong patterns of religious consumption.

### *Religious Preferences and Religious Consumption*

In rational choice theory, one conceives of being religious as a preference-based choice that has implications for how one spends resources (e.g., time, attention, effort, and money). Whence do people’s preferences for religion or any other cultural product arise? In part, they are caused by proximity to others (e.g., one’s parents, family members, coworkers, or members of one’s social class) who have similar preferences (Sherkat & Wilson, 1995). Thus, people who were raised in highly religious homes are expected to acquire a strong preference for religion as adults, which they do (McCullough, Tsang, & Brion, 2003; Sherkat & Wilson, 1995).

People also acquire preferences by occupying social roles with which the preference tends to be associated or by living during an historical era in which a given religious “commodity” is particularly popular. People tend to perceive women as more religious than men (McCullough, Worthington, Maxey, & Rachal, 1997), and religion is part of the stereotypically feminine sex role (Francis & Wilcox, 1998), so it seems reasonable to assume that girls are socialized to become more religious than boys. If this is the case, women might tend to develop stronger preferences for religion than do men, and as a result, become more religious than men. The gender difference in religiousness is well established (Stark, 2002). Similarly, people from some birth cohorts may develop stronger preferences for religion than do people from other birth cohorts (e.g., Hamberg, 1991) if religion were particularly fashionable during a time in their lives when their preferences were most malleable. For these reasons, one might expect that people with

strong religious backgrounds will develop patterns of relatively heavy religious consumption during adulthood, women will be more inclined than men to pursue consistently high levels of religious consumption over the life course (Sherkat & Wilson, 1995), and people from particular birth cohorts may develop distinctive patterns of religious consumption.

### *Social Constraints on Religious Consumption*

People who make rational decisions about religious consumption do not choose exclusively on the basis of personal preference; for example, they might also consume high levels of religion out of concern for others or in response to pressure from others (Sherkat, 1998), or to set an example for others (Sherkat & Wilson, 1995). In this light, it could be expected that people might engage in high levels of religious consumption when they seek mates, get married, and have children. They might make this decision during this phase of life for two reasons. First, they may perceive that religion has utility for people they care about, even if they perceive religion to have limited utility for them personally. Adults sometimes eat their vegetables at a particular meal or turn off the TV not because they believe that these choices will be especially good or bad for them, but because they believe that encouraging their children to adopt similar patterns of consumption (or nonconsumption) would be good for their children. Similarly, adults might attend church or temple at certain times because they believe that religion might have present or future utility for their children (e.g., exposing them to other children or caring adults, or a well-articulated system of traditions, values, and morality), even if it has limited utility for them personally.

### *Costs of Religious Consumption: Who Is Willing to Pay?*

Insofar as religion is a cultural product, religious institutions are the purveyors of this product (Finke & Stark, 1992; Iannaccone, 1998). The utility that religion affords—social belongingness, existential certainty, a moral framework, access to potential mates, or even “a place on the basketball team” (Sherkat & Wilson, 1995, p. 999)—is diluted by “free riders” who take advantage of these resources without helping to replenish them (Finke & Stark, 1992). Therefore, religious institutions often exert social pressures on consumers to contribute to the welfare of the religious system itself. Requiring commitment in the form of regular attendance at worship services, financial giving, caring for the poor, evangelism, working in religious charities, and the like helps to build up the religion’s utility even as it deters free riders. Generally, the more people stand to gain from a religious institution, the more conformity and contribution to the common good are required (Finke & Stark, 1992).

If everyone’s religious preferences were the same, who would be most amenable to bearing the costs associated with adhering to a formal religious system? It is here that personality may play a role. Of the Big Five personality traits, Conscientiousness and Agreeableness may be especially important predictors because they are the most reliable Big Five correlates of religiousness (McCullough et al., 2003; Saroglou, 2002). Conscientious people abide by rules and conventions because they are organized, prompt, and form new habits easily. Thus, highly conscientious people might easily bear the costs that religious involvement

requires, whereas less conscientious people might have difficulty adhering to these external demands upon their time, attention, energy, and finances. Agreeableness also motivates people to abide by convention, largely out of concern for the feelings and rights of others and an ability to tolerate interpersonal frustrations (Jensen-Campbell et al., 2002). Agreeable people also respond more constructively to interpersonal conflict (Graziano, Jensen-Campbell, & Hair, 1996). On this basis, rational choice theory might lead to the hypothesis that highly agreeable people maintain high religious involvement simply because they are more tolerant of religious institutions’ impositions upon their time, attention, energy, and finances than are less agreeable people.

### Religion and Rational Choice in the Terman Study

The present study used growth mixture modeling to explore religious development with data from the Terman Life Cycle Study of Children With High Ability (Terman, Sears, Cronbach, & Sears, 1990). All longitudinal data are locked into the time and place in which they were collected, and the Terman data are no exception: The study’s sample of bright young Californians grew up to be considerably less religious, on average, than the general American public. Thus, the present study in part can be seen as an attempt to make sense of the religious lives of a particular set of people who, in general, were much brighter and much less religious than those around them. However, the present study was also theoretically driven. On the basis of rational choice theory, we hypothesized that people’s lifelong patterns of religious consumption would be related to variables relevant to their preferences—namely, gender, emphasis placed on religion in their childhood homes, and birth cohort. Second, we hypothesized that getting married and having children—variables that should guide consumption irrespective of preferences—would also be related to lifelong consumption patterns. Third, we hypothesized that highly conscientious and agreeable people would manifest relatively high religious consumption over the adult life course.

## Method

### *Participants*

The Terman study initially involved 1,528 intellectually bright (IQs exceeding 135) boys and girls who were residents of California. In the present study, we used 1,151 of the original Terman study participants (56% male, 44% female; ages in 1940 ranged from 24–40 years). The 377 participants we excluded either (a) were lost to follow-up or died before 1940, (b) were missing data on at least one of the between-persons predictors of trajectory class membership, or (c) did not have at least one nonmissing measure of religiousness.

As of 1940, these mostly White, middle-class adults were well educated (approximately 99% had high school diplomas, 89% had at least some college experience, 70% had at least a bachelor’s degree, 45% had at least a master’s degree, and 8% had one or more doctoral degrees). In 1940, the participants were approximately 45% Protestant, 3% Catholic, 5% Jewish, 2% other; the remaining 45% indicated no church affiliation. Most (65%) were married (31% single and 3% divorced) and by the end of their lives, 91% of them had married at least once. Of those who eventually married, the mean and median number of children was 2.0 ( $SD = 1.4$ ). No one who stayed unmarried reported having any children.

### Measures of Religious Consumption

Although Terman and successive directors of the Terman study collected extensive data on participants' religious lives (including dozens of items in checklist or Likert-type format), none of the religious questions posed to participants was repeated in exactly the same way across surveys. For example, in 1940 participants indicated their degree of interest in religion with a single item by using a 5-point scale (1 = *none* and 5 = *very much*), they indicated how much they liked reading the Bible with a 3-point scale (1 = *like*, 2 = *indifferent*, and 3 = *dislike*), they indicated their agreement with the idea that giving children religious instruction is essential for a successful marriage by using a 5-point scale (1 = *very essential* and 5 = *decidedly not desired*), and they indicated the number of religious activities in which they were involved (out of five possible activities). Many participants also wrote qualifications to their closed-ended responses in the margins of their surveys. In contrast, the 1991 survey included items that instructed respondents to indicate how important nine different aspects of religion and church (e.g., worship and prayer; spiritual reading, or radio/TV; and trying to understand religious truths more deeply) were to them (on a 3-point scale ranging from *very* to *not at all*), and a series of items that instructed them to indicate whether those nine aspects of religion or church had become more or less important in recent years.

Clearly, then, religious information on these participants was plentiful, but not directly comparable across waves of data collection. Such frustrations are not uncommon in longitudinal work (Elder, Pavalko, & Clipp, 1993), but social scientists have found a productive way to cope with them: As in other recent work on religious development (Wink & Dillon, 2001, 2002) we used a "recasting" method (Elder et al., 1993) to develop a 6-point rating scale for measuring participants' religiousness. This measure is conceptually similar to other measures of religiousness that have been used in previous longitudinal research on religious development among adults (e.g., Argue et al., 1999; Wink & Dillon, 2001). A single rater (A. R. J.) read all information that participants provided regarding their religiousness in six waves of data collection (1940, 1950, 1960, 1977, 1986, and 1991). After reading the religious information on a given participant for a given year, the rater then provided a single integer value reflecting her perceptions of the participant's religiousness at that point in the participant's life. The points on the rating scale were defined as follows:

–1 = Actively antireligious, noted by lack of personal religious interest/inclination, total lack of life satisfaction gained from religion, and some degree of hostility/suspicion regarding religion or religious beliefs;

0 = Religion has no importance in subject's life, as noted by no religious interest, no religious inclinations, and total lack of life satisfaction gained from religion;

1 = Religion has slight importance in subject's life, as noted by slight interest in religion, slight religious inclination, or a slight degree of life satisfaction gained from religion;

2 = Religion has moderate importance in subject's life, as noted by average interest in religion, moderate religious inclination, or a moderate degree of life satisfaction gained from religion;

3 = Religion has above average importance in subject's life, as noted by above-average interest in religion, above-average religious inclination, or a high degree of life satisfaction gained from religion;

4 = religion has very high importance in subject's life, as noted by very high interest in religion, very high religious inclination, or very high degree of life satisfaction gained from religion.

Very few participants received scores of –1. Therefore, to minimize computational difficulties (as in McCullough & Boker, in press), we combined scores of –1 with scores of 0, which resulted in a 5-point scale ranging from 0 to 4.

*Interrater reliability.* To estimate interrater reliability, a second rater (M. E. M.) also applied the rating scale to the religious material from 148 randomly selected participants, and the ratings for the two raters were compared. The reliability analysis was a 148 (participants) × 6 (years) × 2 (raters) fully crossed design with missing data (i.e., not all participants provided religiousness scores for all six time points). We wished to estimate the amount of variance in the measurements that could be attributed to nonartifactual sources. That is, we wished to know what percentage of variance in the religiousness ratings could be attributed to (a) consistent individual differences among the 148 participants (i.e., the extent to which some participants were consistently more religious than others across all six points in time); (b) consistent effects of time on participants' religiousness (i.e., the extent to which all participants were, on average, consistently more religious at certain measurement points than at others); and (c) the interaction of participants and time (i.e., the extent to which time affected some participants' religiousness in different ways than others).

In this rating design there were four artifactual sources of error: (a) rater bias (i.e., the extent to which one rater rated people more religious than did the other rater); (b) the interaction of participants and raters (i.e., the extent to which one rater rated some participants higher in religiousness than did the other rater), (c) the interaction of time and raters (i.e., the extent to which one rater rated participants differently at specific time points than did the other rater), and (d) the interaction of raters, participants, and time (i.e., the extent to which one rater rated some participants higher in religiousness at specific points in time than did the other rater), which was confounded with error. We conducted a variance components analysis to estimate the variance in the ratings attributable to each of the abovementioned sources (Hoyt & Melby, 1999). We intended that the results generalize beyond the raters, participants, and years of measurement included in this study, so we treated the sources of variance as random effects.

Approximately 95% of the variance in our measures could be attributed to substantive sources (see Table 1). Roughly 66% of the variance could be attributed to consistent differences among the 148 participants (i.e., people who were more religious than their peers at any point in time tended to stay relatively religious relative to their peers at other points in time), and 26% could be attributed to the interaction of participants and time (i.e., unique effects of the passage of time on individual participants' religiousness scores, with very little variance due to rater bias and the interactions of

Table 1  
Variance Accounted for by Seven Sources of Variance for Religiousness

Source of variance	Variance accounted for	% Variance accounted for
Participants	1.485	65.75
Time	0.0789	3.49
Raters	0 <sup>a</sup>	0.00
Participants × Time	0.583	25.81
Participants × Raters	0.01661	0.74
Time × Raters	0.000414	0.02
Participants × Time × Raters	0.09458	4.19
Substantive sources (Participants + Time + Subjects × Time)	2.1469	95.06
Artifactual sources (Rater effects + interactions with rater effects)	0.111604	4.94
Total	2.258504	100.00

<sup>a</sup> Variance estimate exceeded lower bound and so was constrained to zero.

rater bias with other effects. Table 2—which displays the correlations of the measures of religiousness from the 1940, 1950, 1960, 1977, 1986, and 1991 data—highlights that religiousness manifested high rank-order stability over adulthood; that is, people who were highly religious relative to their peers at any point in time also tended to be highly religious relative to their peers at other points in time.

*Validity.* To determine whether the measures of religiousness had adequate construct validity, we performed two analyses. First, we calculated participants' means on the six measures of religiousness and correlated these means with the means from six measures of formal religious participation that we also developed for each participant (for these analyses, we used all available religion data, not simply from those participants who had all nonmissing covariates). Scores on the measure of formal religious participation ranged from 0 (*no formal religious association, as noted by lack of involvement with religious organizations or institutions and no affiliation with a religious tradition*) to 4 (*very high degree of formal religious association, as noted by involvement in three or more religious organizations or activities, perhaps in addition to identification with a formal religious tradition [e.g., "I'm Catholic"]*). Individuals' mean levels of religiousness over their adult life course were highly correlated with their mean levels of formal religious participation over their adult life course,  $r(N = 1356) = .64, p < .001$ .

We also examined the within-persons associations of our measures of religiousness and religious participation using the hierarchical linear model (Raudenbush & Bryk, 2002) statistical package. In this model, each individual's religiousness at a single measurement occasion was modeled as a function of the individual's mean religiousness over the life span, his or her formal religious participation score at that same point in time (centered on each individual's mean religious participation score), and an occasion-specific residual. Within-persons fluctuations in formal religious participation were significantly associated with within-persons fluctuations in religiousness (coefficient = .275,  $SE = .0229$ ), effect size  $r(N = 1139) = .34, p < .001$ . In other words, on occasions when a person's religiousness was higher than was typical for him or her, his or her formal religious participation also tended to be higher than was typical for him or her. Taken together, these analyses suggest that our measure of religiousness measures between-persons and within-persons differences in religiousness with adequate reliability and validity.

### Measures of Preference for Religion

To measure individual preferences for religion, we measured the strength of participants' religious upbringing with two items. The first item, administered in 1940, instructed them to indicate "religious training received," where 1 = *none* and 5 = *very strict*. A second item, administered in 1951, instructed them to indicate their "religious training in childhood and youth," where 1 = *none* and 4 = *very strict*. Although the two items were administered more than a decade apart, their correlation was  $r = .78$ . We used the mean of these two items, which had an internal consistency reliability of .86. We also measured participants' gender (0 = *male*; 1 = *female*) as a preference measure because it is believed that

women are more strongly socialized than men to have strong preferences for religion (Sherkat & Wilson, 1995).

In addition, we explored the possibility of cohort differences in religious consumption by using birth cohort (0 = *born in 1910 or earlier*; 1 = *born 1911 or later*) as a predictor. We used 1910 as the cutoff point for the birth cohorts for four reasons. First, it is psychologically meaningful because people commonly define their generational identities in terms of their decades of birth (Rogler, 2002). Second, 1910 is a year that social theorists (Putnam, 2000; Rogler, 2002) often use to identify the beginning of "the long civic generation." People from the long civic generation were born between 1910 and 1940 and received their distinction because their experiences in World War II led them to become highly involved in civic pursuits. Because these individuals had apparently strong preferences for civic activities, their preferences for religion also may have been influenced (see also Hamberg, 1991; Putnam, 2000). Third, it is statistically convenient because it splits the sample into two cohorts of approximately equal size, thereby maximizing statistical power for cohort comparisons. Fourth, this cutoff point has been used in prior work with this data set to create birth cohorts (Elder, Shanahan, & Clipp, 1997).

### Social Constraints on Religious Consumption

People who eventually marry and have relatively large numbers of children may be prone to high levels of religious consumption irrespective of their preferences, so we included measures of whether participants ever married in their lifetimes (0 = *no*; 1 = *yes*) and the number of children they had in their lifetimes (range = 0–5).

### Measures of Personality

To measure personality traits that might influence one's pattern of religious consumption over the life course, we measured Conscientiousness, Extraversion, Agreeableness, and Neuroticism by using measures previously developed for use with the Terman data (Martin & Friedman, 2000). These scales were based on participants' responses in 1940 to a series of self-report items including 53 items that Terman and his associates drew from an existing inventory (Bernreuter, 1933). On the basis of extensive psychometric analyses, including structural equation models confirming that the psychometric properties of the individual items were essentially the same in the Terman sample as in a contemporary sample of adults, Martin and Friedman developed measures of Conscientiousness (7 items;  $\alpha = .65$ ), Extraversion (7 items;  $\alpha = .65$ ), Agreeableness (11 items;  $\alpha = .72$ ) and Neuroticism (17 items;  $\alpha = .85$ ). These scales were highly correlated with the target scales from the Revised NEO Personality Inventory (monomethod-heterotrait  $r$ s ranged from .63 to .81) and only modestly correlated with the off-target scales from the Revised NEO Personality Inventory (heterotrait-heteromethod  $r$ s ranged from .101 to .136).

### Analyses

We used growth mixture models to examine whether the heterogeneity in individuals' religious consumption during adulthood resulted from their

Table 2  
Number of Observations and Pearson Correlations for Measures of Religiousness, 1940–1991

Year	N	1940	1950	1960	1977	1986	1991
1940	1,110	—					
1950	983	.61	—				
1960	894	.58	.92	—			
1977	650	.59	.83	.88	—		
1986	606	.53	.59	.63	.73	—	
1991	399	.55	.63	.68	.78	.80	—

Note.  $N$ s for correlation coefficients range from 353 to 1,103. All correlations are significant at  $p < .001$ .

membership in distinct trajectory classes rather than from parametric differences among people drawn from a single trajectory class. To do so, we began by using the Mplus statistical software (Muthén & Muthén, 2004) to conduct a single-class growth curve model (Hedeker, 2004). In this model, we specified that the individual differences in religious development were produced by interindividual differences in (a) intercepts, centered on age 53.5, which was the midpoint age for the sample; (b) rates of linear change in religiousness over the life course; and (c) rates of quadratic change, or curvature, in religiousness. The within-person models were of the form:

$$RC_{ij} = \beta_{0j} + \beta_{1j}(\text{year}_{ij}) + \beta_{2j}(\text{year}_{ij})^2 + r_{ij} \quad (1)$$

where  $RC_{ij}$  = person  $j$ 's religious consumption at time  $i$ ;  $\beta_{0j}$  = person  $j$ 's religious consumption at the intercept, or midpoint of the age range that we investigated (age 53.5 years), which can also be interpreted as person  $j$ 's mean level of religiousness over the life course (controlling for higher-order effects for age);  $\beta_{1j}(\text{year}_{ij})$  = person  $j$ 's constant rate of linear change in religiousness between ages 27 and 80;  $\beta_{2j}(\text{year}_{ij})^2$  = curvature in person  $j$ 's longitudinal trajectory; and  $r_{ij}$  = an occasion-specific residual in person  $j$ 's religious consumption score at time  $i$  that cannot be predicted on the basis of his or her intercept, constant rate of change, and curvature between ages 27 and 80. To minimize collinearity among the intercept and the linear and quadratic growth components, we used orthogonal polynomials to represent the basis coefficients (Hedeker, 2004), which centered individuals' growth curves on age 53.5. We also attempted to run models including parameters for cubic-order change, but these models did not converge.

The one-class model yielded a statistic called the sample size-adjusted Bayesian Information Criterion (BIC), which is a parsimony goodness-of-fit index based on the log-likelihood adjusted for the number of parameters. The sample size-adjusted BIC for the one-class model provided a baseline measure of goodness of fit to which we were able to compare models positing multiple trajectories of development. Lower BIC values reflect better model fit.

Having evaluated a one-class growth curve model, we then used Mplus to conduct a growth mixture model in which the interindividual differences in religious development were posited to result from the presence of two qualitatively distinct trajectory classes. This model also yielded a BIC value, along with a measure of entropy, which is a measure of classification quality (values range from 0 to 1, with values closer to one indicating that individuals are classified into individual trajectory classes with good precision). The two-class model also yielded the Lo-Mendell-Rubin likelihood ratio test (Lo, Mendell, & Rubin, 2001), which provided a significance test of whether two trajectory classes provided a better fit to the data than did the one-class model. In the two-class model and successive growth mixture models, we allowed the trajectory components within classes to vary (i.e., variance components for the growth factors were freely estimated), and we allowed the level-1 residual variances to vary across classes. Having computed a two-class model, we proceeded to estimate models that posited the existence of three and four latent trajectory classes, respectively.

After determining the most parsimonious growth mixture solution, we then used the measures of religious preference (i.e., religious upbringing, gender, and cohort); social constraints on religious consumption (i.e., history of marriage and number of children); and personality traits (i.e., Conscientiousness, Extraversion, Agreeableness, and Neuroticism) to predict trajectory class membership. This portion of the model, which regresses one or more latent categorical variables (representing membership in a specific trajectory class) on the set of covariates, can be interpreted as a multinomial logistic regression. In this case,  $k - 1$  (where  $k$  = the number of latent trajectory classes) sets of logistic regression coefficients are obtained that express the log-odds of belonging to a specific trajectory class relative to a reference class.

## Results

### Descriptive Statistics

Means, standard deviations, and ranges for the major study variables appear in Table 3.

### One-Class Versus Multiclass Models

*One-class model.* The one-class model yielded a sample size-adjusted BIC of 11616.75 (see Table 4). The mean growth trajectory in this model resembled a parabola with negative curvature (i.e., downward concavity). For the growth trajectory in this model, the mean estimated religiousness was 1.34 at age 27. This value increased until age 56 (peaking at an expected value of 2.00), and then decreased through the remainder of the life course. At age 80, the typical individual in this sample was expected to have a value of 1.57 for religiousness. The net (i.e., linear) change in religiousness across the 27–80 age span did not differ from zero.

*Two-class model.* A two-class model yielded a sample size-adjusted BIC of 10688.92, which was lower than the BIC for the one-class model. This model also yielded a significant adjusted Likelihood Ratio Test = 1106.48,  $p < .001$ , suggesting that the two-class model provided a better fit to the data than did the one-class model. In this model, classification quality was adequate, as noted by the high entropy value (.803) and the high classification probabilities (which were .980 and .890 for Classes 1 and 2, respectively). Class 1, which comprised 59.08% of the sample, included people who tended to have moderate religiousness early in life (mean religiousness at age 27 = 2.25), marked increases in religiousness until approximately age 58 (at which time religiousness peaked at 3.19) and declines in religiousness throughout the remainder of the life course (with only trivial net changes in religiousness from age 27 to age 80). For this first class, the expected value of religiousness at age 80 was 2.68. Class 2, which comprised 40.92% of the sample, included people who tended to have very low religiousness early in adulthood (mean religiousness

Table 3  
*Means, Standard Deviations, and Ranges for Major Study Variables*

Variable	<i>M</i>	<i>SD</i>	Range
1940 Religiousness	1.33	1.19	0–4
1950 Religiousness	1.74	1.42	0–4
1960 Religiousness	1.79	1.46	0–4
1977 Religiousness	1.75	1.51	0–4
1986 Religiousness	1.48	1.47	0–4
1991 Religiousness	1.45	1.48	0–4
Gender (0 = male, 1 = female)	44 <sup>a</sup>	NA	0–1
Religious upbringing	2.68	0.77	1–4.50
Cohort (0 = pre-1910, 1 = post-1910)	49 <sup>a</sup>	NA	0–1
Ever married (0 = no; 1 = yes)	91 <sup>a</sup>	NA	0–1
No. of children	1.86	1.41	0–5
Conscientiousness	0.02	3.91	–11.73–10.51
Extraversion	0.02	3.99	–10.13–10.15
Agreeableness	–0.05	5.63	–16.07–11.48
Neuroticism	0.02	9.10	–17.27–28.69

Note. NA = not applicable.

<sup>a</sup> Percentage of participants falling in the category coded as 1.

Table 4  
*Bayesian Information Criterion (BIC), Entropy Index, and  
 Lo–Mendell–Rubin Adjusted Likelihood Ratio Test (LRT)  
 Values for One-, Two-, and Three-Class Models*

Model	BIC	Entropy	Lo–Mendell–Rubin adjusted LRT
One-class	11616.75	NA	NA
Two-class	10688.92	.803	1106.48*
Three-class	10456.53	.790	413.13*

Note. NA = not applicable.

\*  $p < .05$ .

at age 27 = 0.43), slight increases to age 52 (with a maximum value of 0.74 for expected religiousness), and reductions in religiousness throughout the remainder of the life course (expected religiousness at age 80 was 0.38).

*Three-class model.* The three-class model yielded a sample size-adjusted BIC of 10456.53, which was lower than in the two-class model. This model also yielded a significant adjusted Likelihood Ratio Test = 413.13,  $p < .001$ , suggesting that the three-class model provided a better fit to the data than did the two-class model. In this model, classification quality was adequate, as noted by a high entropy value (.790) and the high classification probabilities (probabilities that individuals were classified into the correct classes ranged from .853 to .924).

A class comprising approximately 40.4% of the sample consisted of individuals with intermediate levels of religiousness early in adulthood (estimated religiousness at age 27 = 1.37). The most distinctive feature of the trajectory of people in this group, however, was that they appeared, on average, to experience relatively large increases in religiousness until age 54, at which time their values tended to reach a maximum value of 2.31. After this point in the life course, people in this class experienced reductions in religiousness throughout the remainder of the life course. By age 80, their mean religiousness was 1.37—exactly the same as it was at age 27. We therefore named this class the “parabolic” class. The mean growth curves for the three trajectory classes are depicted in Figure 1.

A second class comprising roughly 40.8% of the sample consisted of people with very low religiousness in early adulthood (estimated mean religiousness at age 27 = 0.51) and small declines in religiousness through age 80. We therefore named this the “low/declining” class.

A third class comprising 18.8% of the sample consisted of people who tended to have high religiousness in early adulthood (mean at age 27 = 2.90), and small linear increases through age 80. Estimated religiousness for the typical individual in this sample peaked at age 68 with a score of 3.75). We named this class the “high/increasing” class.<sup>1</sup>

*Four-class model.* The four-class model with free variances and covariances for the growth parameters failed to converge even after many attempts to find acceptable starting values. Such convergence failures tend to indicate that the maximum number of classes has been extracted and that further attempts to extract new classes are likely to be unproductive. By constraining the variances and covariances among the growth parameters to zero, we were able to obtain convergence for a four-class model, but the model

was not noticeably more useful than the three-class model, and led to only marginal changes in goodness-of-fit. These results strongly suggest that the three-class model is superior to the four-class model (Muthén, 2003).

### *Predictors of Trajectory Class Membership for the Three-Class Model*

Having concluded that the three-class model was the best depiction of the trajectory classes present in this population of trajectories, we then examined whether variables influencing religious preferences (i.e., gender, religious upbringing, and cohort); social constraints on religious consumption (i.e., whether participants ever married and the number of children they had); and personality traits (i.e., Conscientiousness, Extraversion, Agreeableness, and Neuroticism) predicted membership in the three trajectory classes. Table 5 shows the results of regressing participants’ latent class memberships upon these predictors simultaneously. The coefficients are logistic regression coefficients representing the increase in log-odds of membership in the low/declining religious consumption class relative to membership in the parabolic religious consumption class, or membership in the high/increasing religious consumption class relative to membership in the parabolic class, respectively, that is associated with a one-unit increase in each predictor. The estimated odds ratios result from exponentiating the base of the natural log  $e$  to the power of the logistic regression coefficient. The continuous predictors were centered on their grand means and dichotomous variables were centered on their zero values, which allowed us to assess the interactions among predictors (which were consistently nonsignificant, and therefore are not presented or discussed herein). Because the parabolic class was the closest description of the trajectory to emerge from the one-class growth model, we used it as the reference class.

*Membership in the low/declining religious consumption class.* People in the low/declining trajectory class differed from those in the parabolic class on two variables associated with religious preferences, one variable associated with social constraint on religious consumption and one personality variable. First, women were less likely than men to belong to the low/declining trajectory class: as Table 5 shows, the women’s log-odds of being classified in the low/declining trajectory class versus the parabolic class were .673 lower than the men’s. Converted to an odds ratio, this implies that women’s odds of belonging to the low/declining religious consumption class were only 51% as high as they were for men, holding other covariates constant. In addition, a one-unit increase in religious upbringing was associated with a .550 decline in

<sup>1</sup> Because mixture model analyses are particularly sensitive to local maxima on the likelihood, the random starting value option in Mplus 3 was used to investigate the quality of the final model. Specifically, 100 random perturbations of our initial starting values were generated, and these 100 sets of starting values were used to estimate the three-class model for a total of 20 iterations. Based on the log likelihood values from this initial estimation phase, the 20 “best” sets of starting values were chosen, and the model was subsequently estimated 20 times, once for each set of starting values. The 15 solutions that ultimately converged produced log likelihood values and parameter estimates that were virtually identical, so the subsequent results do not appear to represent a local maximum.

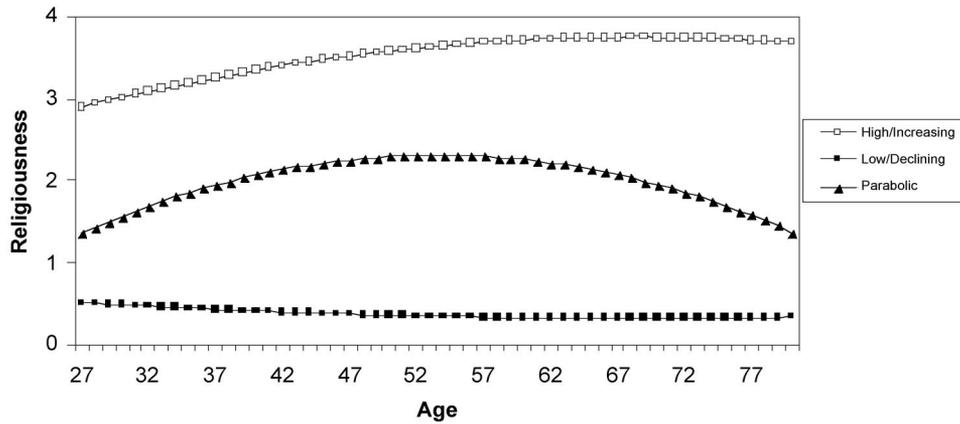


Figure 1. Mean growth curves for the trajectory classes resulting from the three-class growth mixture model. The high/increasing growth trajectory class includes individuals who tended to be highly religious in early adulthood, becoming more religious with age. The low/declining growth trajectory class includes largely nonreligious individuals who tended, on average, to become progressively less religious as they aged. The parabolic growth trajectory class includes individuals who were somewhat religious in early adulthood, becoming more so in midlife, and then becoming less religious through the remainder of the life course.

log-odds (or, using the odds ratio from Table 5, a  $1 - .577 = 42.3\%$  reduction in odds) of belonging to the low/declining religious consumption class versus the parabolic class.

Participants with relatively small families were less likely to belong to the low/declining class of religious consumption than were individuals with larger families. The addition of one child to one's family was associated with a .136 reduction in the log-odds of belonging to the low/declining religious consumption class. Converted to an odds ratio, this implies that the odds that an individual with three children would belong to the low/declining class of religious consumption were only 87.3% as high as they were for an individual who had only 2 children, holding other covariates constant. This association only trivially exceeded conventional criteria for statistical significance (i.e.,  $p = .053$ , two-tailed).

Finally, a one-unit increase in Agreeableness was associated with a .035 reduction in the log-odds of belonging to the low/

declining class as opposed to the parabolic class. Converted to an odds ratio, this implies that the odds of being in the low/declining class for an individual at a given level of Agreeableness were 96.6% as high as they were for someone who scored one unit lower in Agreeableness, holding other covariates constant.

*Membership in the high/increasing religious consumption class.* People in the high/increasing religious consumption class differed from those in the parabolic class in terms of one variable associated with religious preferences, one variable associated with social constraints on religious consumption, and one personality variable. A one-unit increase in religious upbringing was associated with a .651 increase in log-odds (or a 91.7% increase in odds) of belonging to the high/increasing religious consumption class instead of the parabolic class. Getting married during one's lifetime was associated with a 1.186 reduction in log-odds (or a  $1 - .305 = 69.5\%$  reduction in odds) of belonging to the high/increasing religious consumption class (10.6% of them stayed unmarried, whereas only 3.7% of people in the parabolic trajectory class stayed unmarried). In other words, heavy religious consumption that increased over the life span was associated with staying unmarried for one's entire life, holding other covariates constant. Finally, a one-unit increase in Agreeableness was associated with a .066 increase in log-odds (or a 6.8% increase in odds) of belonging to high/increasing religious consumption class as opposed to the parabolic class. In other words, heavy and increasing religious consumption was particularly common among agreeable adults, holding other covariates constant.

*Characterizing the parabolic pattern of religious consumption.* In the preceding paragraphs, people in the parabolic religious consumption class were used as a reference class and so they are implicitly characterized by describing how people in the two other religious consumption trajectory classes differed from them. Nevertheless it is useful to summarize the characteristics of people in the parabolic religious consumption class. There were more women in the parabolic class than in the low/declining class but their gender composition did not differ from those in the high/

Table 5  
Predictors of Membership in the Low/Declining Trajectory Class and the High/Increasing Trajectory Class

Variable	Low/declining class vs. Parabolic class		High/increasing Class vs. parabolic Class	
	Coefficient	Odds ratio	Coefficient	Odds ratio
Intercept	0.753	2.123	0.087	1.091
Gender	-0.673*	0.510	-0.139	0.870
Religious upbringing	-0.550*	0.577	0.651*	1.917
Post-1910 cohort	-0.180	0.835	-0.095	0.909
Ever married	-0.649	0.523	-1.186*	0.305
No. of children	-0.136†	0.873	0.094	1.099
Conscientiousness	-0.031	0.969	-0.004	0.996
Extraversion	-0.007	0.993	0.027	1.027
Agreeableness	-0.035*	0.966	0.066*	1.068
Neuroticism	-0.012	0.988	0.000	1.000

\*  $p < .05$ . †  $p = .053$ .

increasing class. Their religious upbringings were stronger than those of people in the low/declining class, but weaker than those of people in the high/increasing class. They were more likely to get married at some point during their lives than were people in the high/increasing class, and they had more children than did people in the low/declining class. Finally, they were more agreeable than people in the low/declining class, but less agreeable than people in the high/increasing class.

### Discussion

Using growth mixture modeling, we found evidence for three distinct trajectories of religious development during adulthood among participants in the Terman study. The first trajectory class, comprising approximately 40% of the sample, consisted of people who entered adulthood only slightly religious, but who became increasingly religious through midlife (at which time religion was, on average, “moderately important” in their lives). Following midlife, these people tended to experience declines in religiousness that were almost perfectly symmetrical to the increases that they experienced until midlife.

A second trajectory class, comprising approximately 41% of the sample, included people with low levels of religiousness in early adulthood that gradually became even lower as they passed through the adult life course. A third trajectory class, comprising approximately 19% of the sample, included people with relatively high levels of religiousness in early adulthood (i.e., religion was of “above average” importance at age 27) that increased throughout most of adulthood. This trajectory most closely resembled the typical trajectory of religious development in representative samples of adults in the United States (Argue et al., 1999). That such a small percentage of participants in this sample belonged to this trajectory class is probably due to the fact that the Terman participants were considerably less religious than the U. S. general population: Only 40% of the Terman participants were church members in 1941, whereas 72% of American adults belonged to a church or synagogue in 1940 (Gallup, 1995). Moreover, 45% of Terman participants indicated no religious affiliation in 1941—a sevenfold increase in comparison to adults in the general population as of 1947 (Gallup, 1986).<sup>2</sup>

#### *Change and Stability in Religiousness Over the Adult Life Course*

As Figure 1 shows, the three religious trajectory classes were surprisingly distinct: The trajectories did not cross each other and at every point in time, the mean differences among the trajectory classes were substantial. Thus, although cross-sectional differences in religiousness are thought to paint only a limited portrait of how individuals’ religious beliefs and values develop over time (Brennan & Mroczek, 2002), our findings suggest that cross-sectional differences in religiousness may in one sense be adequate proxies for people’s trajectories of religious development. For example, if we knew that an individual had a religiousness score of 3.0 at age 27, we could safely predict that he or she was likely to belong to the high/increasing trajectory class. If, in addition to knowing how religious this person was at age 27, we also knew how religious this person was at age 35, we could predict his or her trajectory class membership with even greater certainty, and on

this basis, we could make some good predictions for how his or her religiousness was going to develop over the subsequent 45 years.

The clear separation of the three growth trajectories certainly arises in part from the relatively good rank-order stability of religiousness over adulthood. As our variance components analysis demonstrated, nearly two thirds of the variation in religious consumption could be attributed to stable, interindividual differences: People who scored high on religiousness relative to other people in the sample at any given point in time were likely to score high on religious consumption relative to other people in the sample at any other point in time. Indeed, religious consumption in 1940 was correlated at .55 with religious consumption in 1991, suggesting moderate rank-order stability even over a 50-year period. Over shorter time spans, rank-order stability was even better (approaching .90 for some 10-year intervals).

These findings yield a surprising and important insight: Although between-persons differences in religiousness are relatively stable across the adult life course, there is also within-persons variability (with some individuals becoming more religious, some becoming less religious, and some becoming more and then less religious as they age). The theme of interindividual stability in the presence of intraindividual change has also been an important lesson to emerge in the last decade regarding personality development during adulthood more generally (Helson et al., 2002; Roberts & DelVecchio, 2000; Roberts et al., 2002), with many personality traits showing impressive rank-order stability (e.g., people tend to maintain their ranking on a given personality trait relative to their peers over several decades), while at the same time showing evidence of mean-level change (e.g., people’s absolute values on a given trait can change over time). The present findings illustrate that a complete understanding of religious development over the adult life course must take into account that people who are highly religious relative to their peers tend to stay highly religious relative to their peers, while at the same time, the intensity of individuals’ religiousness can increase, decrease, or even increase and then decrease over the adult life course (see Ingersoll-Dayton et al., 2002).

#### *Trajectories of Religious Development as Lifelong Patterns of Religious Consumption*

Having found three trajectories of religious development, we then set out to explain why some people are more prone to adopt certain religious trajectories than others, based on rational choice theory (e.g., Finke & Stark, 1992; Sherkat & Wilson, 1995; Stark & Finke, 2000).

*Predicting trajectory class membership with preference-related variables.* Sherkat and Wilson (1995) argued that preferences for a given cultural product are “adaptive” in that they change as familiarity with the product increases. Our findings are consistent with their argument: A history of proximity to religious role models (viz., parents) and being female—the gender that is most strongly socialized to be religious and with which being religious is most commonly associated (McCullough et al., 1997) were linked to heavier religious consumption.

<sup>2</sup> As far as we have been able to discern, 1947 was the first year that this item was included in a Gallup survey.

Specifically, the stronger one's religious upbringing during childhood, the heavier one's religious consumption through adulthood: People with the parabolic pattern of religious consumption had stronger religious upbringings than did people in the low/declining trajectory class and weaker religious upbringings than did people in the high/increasing trajectory class. Moreover, women were less likely than men to adopt a pattern of low/declining religious consumption through adulthood. Taken together, our findings show that variables related to one's social roles and socialization history can exert lifelong effects on religious consumption.

*Predicting trajectory class membership with variables related to social constraints on choice.* Sherkat and Wilson (1995) observed that one's choices about which cultural products to consume are not based solely on "a calculus of rewards and costs, reflecting a schedule of preferences." Rather, "we consume not only to maximize our own utility, but also to please those around us or avoid their wrath" (p. 998). In support of Sherkat and Wilson's argument, we found that two variables reflecting social constraints upon one's choices regarding religious consumption were useful for predicting trajectory class membership. Relative to people who never married, those who married at some point during their lives were more likely to belong to the parabolic trajectory class (which is characterized by modest religious consumption in early adulthood that increased in midlife, only to decline again after midlife) than to the high/increasing trajectory class. Also, we discovered that people with the parabolic pattern of religious consumption had, on average, more children than did people who had low and decreasing levels of religious consumption. In other words, people in the parabolic class were more likely than people in other classes to manifest traditional family structures: Nearly all (i.e., 96.3%) of them married and had relatively large numbers of children.

A rational choice interpretation of these findings is that after statistically equating people in the three trajectory classes on the basis of their religious preferences (i.e., by statistically controlling gender, religious upbringing, and cohort), people with the parabolic consumption pattern were more prone than others to increase their religious consumption during their 30s and 40s as they established families and raised children. They might have done so to set a good example for their children or because they believed that religion might have utility for their families and children in the present (e.g., opportunities to interact with other children and caring adults, integration in the community, or exposure to a well-articulated system of traditions, values, and morality) or in the future. It is well-known that many people increase their religiousness in response to getting married or having children, and then become less religious when their children leave the home or they divorce (Ingersoll-Dayton et al., 2002; Sherkat & Wilson, 1995; Stolzenberg et al., 1995). Moreover, the parabolic pattern of religious consumption is certainly consistent with what one would expect if the individuals in the Terman study who adopted the parabolic pattern of religious consumption also increased their religious consumption for a few decades because of such family life-cycle considerations.

However, people in the parabolic trajectory class did not begin to reduce their religious consumption until they reached their mid-50s—probably some years after most of them had completed their child-rearing duties. At first glance, this fact might cast doubt

on our assertion that these people increased their religious consumption through midlife because of the social constraints associated with family formation and child rearing, but we think the social constraint explanation is still feasible: Through the many years of elevated religious consumption that preceded their eventual disengagement from religion, these individuals probably developed strong ties to their religious communities that sustained their involvement for several years after their children left home, even though the primary concerns that motivated them to increase their religious consumption in the first place (viz., raising children) had become moot.

The parabolic shape of this trajectory—indicating that this class of people tended to increase their religious consumption for several decades only to reduce it through the remainder of the life course—would seem to contradict Iannaccone's (1990) "religious capital" model of religious participation. The religious capital model predicts that these participants would have perceived their religious involvement until midlife as "investments" for which they would have then continued to seek returns through the rest of life, thereby producing mean-level stability or perhaps even further increases in religiousness through the remainder of the life course. Perhaps our social constraint explanation for this growth trajectory and the religious capital explanation can be reconciled by proposing that within any sample, the most religious and the least religious people will show high degrees of mean-level stability over time, indicating their intention to seek return on their investments in religion (for the very religious) or, alternatively, other nonreligious pursuits (for the least religious). People who have a lot invested in religion from the first half of adulthood are not likely to forsake those investments, and those who have shown no interest in religion are not likely to begin investing in belief late in life. This is certainly consistent with the growth trajectories for the high/increasing and low/declining trajectory classes in this study. Conversely, among people who are moderately (but not very) religious in early life, social constraints will be more determinative of their religious trajectories over the life course.

*Predicting trajectory class membership with personality traits.* Rational choice theorists who have discussed individual differences have focused mostly on social status, socialization history, and family structure (e.g., Iannaccone, 1994; Sherkat & Wilson, 1995), but we found that agreeableness may also play a role. Agreeableness in early adulthood predicted religious development over the adult life course, just as it predicts religiousness cross-sectionally (McCullough et al., 2003; Saroglou, 2002). Specifically, the more agreeable one is, it appears, the more religion one consumes over the adult life course.

The key to a rational choice interpretation of this finding is that religion is not a private good but a public one. The religious goods a religious institution provides can be depleted by uncommitted people who do not help to replenish them (Iannaccone, 1994). For this reason, religious communities impose costs on consumers. Costs come in many forms: financial contributions, participation in communal activities, active involvement in charities, evangelism, working to maintain the church property once every few months, forsaking alternative (i.e., nonreligious) activities, and even engaging in behaviors that set oneself off as different from others (e.g., observing purity rituals, speaking in tongues, or maintaining distinct modes of dress). Rational choice theorists commonly assert that such costs are imposed in part to discourage free riders who

would take advantage of the commons (Finke & Stark, 1992; Iannaccone, 1994), but many of these costs also replenish the religion's utility directly.

Agreeable people may be especially favorable to social pressures to contribute to the common good in such ways. Agreeableness is a basic personality dimension associated with the ability to control oneself out of concern for the feelings and rights of other people as well as when one's goals are blocked by other people (for review, see Jensen-Campbell et al., 2002). It is particularly relevant that highly agreeable people refrain from overusing resources that are easily depleted in commons dilemmas (Koole, Jager, van den Berg, Vlek, & Hofstee, 2001). They also have less conflict in their social relationships (Asendorpf & Wilpers, 1998; Graziano et al., 1996). Thus, the association of agreeableness with patterns of heavy religious consumption may reflect the fact that agreeable people are dispositionally suited to respond positively to social pressures to put money, time, and effort back into their religious congregations and traditions—and that they work hard to avoid interpersonal conflicts that could detract from a positive congregational climate.

### Directions for Future Research

These results lead to several directions for future research. First, applying growth mixture modeling to nationally representative data could tell us more about the diversity of religious development in the U.S. population. Second, it would be useful to explore a broader range of developmental and personality antecedents that might explain why individuals tend to follow certain trajectories of religious development, including variables related to individuals' life experiences during childhood and adolescence and variables later in the life course (e.g., changes in work, income, or family composition). Third, it would be informative to apply the approach we used in this study to questions about the associations of religiousness with health and well-being (Koenig, McCullough, & Larson, 2001; McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; T. B. Smith, McCullough, & Poll, 2003). By considering religiousness as a developmental process, rather than simply as an individual difference on which people might differ at any discrete point in time, we can address more sophisticated questions regarding the ways that religious involvement may influence health and well-being over the adult life course, as well as the ways that health might influence religious development (cf. Kelley-Moore & Ferraro, 2001).

### Conclusion

The present study is the first of which we are aware to use growth mixture modeling to describe religious development over the life course. We think it yields two overarching lessons about religious development. The first is that within any population's religious trajectories, several discrete and meaningful pathways of development may exist. This fact might inform attempts to develop formal theories regarding adult religious development (cf. Reich, 1992). The second is that religious preferences, social constraints on religious choices, and personality traits that might suit one to thrive in religious social settings, by virtue of their effects on people's trajectory class membership, can exert enduring influences on people's religious development.

### References

- Argue, A., Johnson, D. R., & White, L. K. (1999). Age and religiosity: Evidence from a three-wave panel analysis. *Journal for the Scientific Study of Religion, 38*, 423–435.
- Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology, 74*, 1531–1544.
- Bahr, H. M. (1970). Aging and religious disaffiliation. *Social Forces, 49*, 59–71.
- Bernreuter, R. G. (1933). The theory and construction of the Personality Inventory. *Journal of Social Psychology, 4*, 387–405.
- Bloom, B. S. (1964). *Stability and change in human characteristics*. New York: Wiley.
- Brennan, M., & Mroczek, D. K. (2002). Examining spirituality over time: Latent growth curve and individual growth curve analyses. *Journal of Religious Gerontology, 14*, 11–29.
- Brown, S. L., Nesse, R. M., House, J., & Utz, R. L. (2004). Religion and emotional compensation: Results from a prospective study of widowhood. *Personality and Social Psychology Bulletin, 30*, 1165–1174.
- Elder, G. H., Jr., Pavalko, E. K., & Clipp, E. C. (1993). *Working with archival data: Studying lives*. Newbury Park, CA: Sage.
- Elder, G. H., Jr., Shanahan, M. J., & Clipp, E. C. (1997). Linking combat and physical health: The legacy of World War II in men's lives. *American Journal of Psychiatry, 154*, 330–336.
- Finke, R., & Stark, R. (1992). *The churching of America, 1776–1990: Winners and losers in our religious economy*. Piscataway, NJ: Rutgers University Press.
- Finke, R., & Stark, R. (2003). The dynamics of religious economies. In M. Dillon (Ed.), *Handbook of the sociology of religion* (pp. 96–109). New York: Cambridge University Press.
- Fowler, J. (1981). *Stages of faith: The psychology of human development and the quest for meaning*. New York: Harper & Row.
- Francis, L. J., & Wilcox, C. (1998). Religiosity and femininity: Do women really hold a more positive attitude toward Christianity? *Journal for the Scientific Study of Religion, 37*, 462–469.
- Gallup, G., Jr. (1986). *The Gallup Poll: Public opinion 1986*. Wilmington, DE: Scholarly Resources.
- Gallup, G., Jr. (1995). *The Gallup Poll: Public opinion 1995*. Wilmington, DE: Scholarly Resources.
- Graziano, W. G., Jensen-Campbell, L. A., & Hair, E. C. (1996). Perceiving interpersonal conflict and reacting to it: The case for agreeableness. *Journal of Personality and Social Psychology, 70*, 820–835.
- Hamberg, E. M. (1991). Stability and change in religious beliefs, practice, and attitudes: A Swedish panel study. *Journal for the Scientific Study of Religion, 30*, 63–80.
- Hedeker, D. (2004). An introduction to growth modeling. In D. Kaplan (Ed.), *The Sage handbook of quantitative methodology for the social sciences* (pp. 215–234). Thousand Oaks, CA: Sage.
- Helson, R., Jones, C., & Kwan, V. S. Y. (2002). Personality change over 40 years of adulthood: Hierarchical linear modeling analyses of two longitudinal samples. *Journal of Personality and Social Psychology, 83*, 752–766.
- Hites, R. W. (1965). Change in religious attitudes during four years of college. *Journal of Social Psychology, 66*, 51–63.
- Hoyt, W. T., & Melby, J. N. (1999). Dependability of measurement in counseling: An introduction to generalizability theory. *The Counseling Psychologist, 43*, 430–447.
- Iannaccone, L. R. (1990). Religious practice: A human capital approach. *Journal for the Scientific Study of Religion, 29*, 297–314.
- Iannaccone, L. R. (1994). Why strict churches are strong. *American Journal of Sociology, 99*, 1180–1211.
- Iannaccone, L. R. (1998). Introduction to the economics of religion. *Journal of Economic Literature, 36*, 1465–1496.
- Idler, E. L., & Kasl, S. V. (1997). Religion among disabled and nondis-

- abled persons. II: Attendance at religious services as a predictor of the course of disability. *Journal of Gerontology: Social Sciences*, 52B, S306–S316.
- Ingersoll-Dayton, B., Krause, N., & Morgan, D. (2002). Religious trajectories and transitions over the life course. *International Journal of Aging and Human Development*, 55, 51–70.
- Jensen-Campbell, L. A., Rosselli, M., Workman, K. A., Santisi, M., Rios, J. D., & Bojan, D. (2002). Agreeableness, conscientiousness, and effortful control processes. *Journal of Research in Personality*, 36, 476–489.
- Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist*, 58, 697–720.
- Kelley-Moore, J. A., & Ferraro, K. F. (2001). Functional limitations and religious service attendance in later life: Barrier and/or benefit mechanism? *Journal of Gerontology: Social Sciences*, 56B, S365–S373.
- Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). *Handbook of religion and health*. New York: Oxford University Press.
- Koole, S. L., Jager, W., van den Berg, A. E., Vlek, C. A. J., & Hofstee, W. K. B. (2001). On the social nature of personality: Effects of extraversion, agreeableness, and feedback about collective resource use on cooperation in a resource dilemma. *Personality and Social Psychology Bulletin*, 27, 289–301.
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, 81, 146–159.
- Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, 88, 767–778.
- Lubinski, D., Schmidt, D. B., & Benbow, C. P. (1996). A 20-year stability analysis of the study of values for intellectually gifted individuals from adolescence to adulthood. *Journal of Applied Psychology*, 81, 443–451.
- Martin, L. R., & Friedman, H. S. (2000). Comparing personality scales across time: An illustrative study of validity and consistency in life-span archival data. *Journal of Personality*, 68, 85–110.
- McCullough, M. E., & Boker, S. M. (in press). Dynamical modeling for studying self-regulatory processes: An example from the study of religious development over the life span. In A. D. Ong & M. V. Dulmen (Eds.), *Handbook of methods in positive psychology*. New York: Oxford.
- McCullough, M. E., Hoyt, W. T., Larson, D. B., Koenig, H. G., & Thoresen, C. E. (2000). Religious involvement and mortality: A meta-analytic review. *Health Psychology*, 19, 211–222.
- McCullough, M. E., Tsang, J., & Brion, S. L. (2003). Personality traits in adolescence as predictors of religiousness on early adulthood: Findings from the Terman Longitudinal Study. *Personality and Social Psychology Bulletin*, 29, 980–991.
- McCullough, M. E., Worthington, E. L., Maxey, J., & Rachal, K. C. (1997). Gender in the context of supportive and challenging religious counseling interventions. *Journal of Counseling Psychology*, 44, 80–88.
- Miller, A. S., & Nakamura, T. (1996). On the stability of church attendance patterns during a time of demographic change: 1965–1988. *Journal for the Scientific Study of Religion*, 35, 275–284.
- Muthén, B. O. (2003). Statistical and substantive checking in growth mixture modeling: Comment on Bauer and Curran (2003). *Psychological Methods*, 8, 369–377.
- Muthén, B. O., Brown, C. H., Masyn, K., Jo, B., Khoo, S., Yang, C., et al. (2002). General growth mixture modeling for randomized preventive interventions. *Biostatistics*, 3(4), 459–475.
- Muthén, B. O., & Muthén, L. K. (2004). *Mplus user's guide* (3rd ed.). Los Angeles: Muthén & Muthén.
- Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Reich, K. H. (1992). Religious development across the life span: Conventional and cognitive developmental approaches. In D. L. Featherman, R. M. Lerner, & M. Perlmutter (Eds.), *Life-span development and behavior* (pp. 145–188). Hillsdale, NJ: Erlbaum.
- Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3–25.
- Roberts, B. W., Helson, R., & Klohnen, E. C. (2002). Personality development and growth in women across 30 years: Three perspectives. *Journal of Personality*, 70, 79–102.
- Rogler, L. H. (2002). Historical generations and psychology: The case of the Great Depression and World War II. *American Psychologist*, 57, 1013–1023.
- Saroglou, V. (2002). Religion and the five factors of personality: A meta-analytic review. *Personality and Individual Differences*, 32, 15–25.
- Sasaki, M., & Suzuki, T. (1987). Changes in religious commitment in the United States, Holland and Japan. *American Journal of Sociology*, 92, 1055–1076.
- Sherkat, D. E. (1998). Counterculture or continuity: Competing influences on baby boomers' religious orientations and participation. *Social Forces*, 76, 1087–1115.
- Sherkat, D. E., & Wilson, J. (1995). Preferences, constraints, and choices in religious markets: An examination of religious switching and apostasy. *Social Forces*, 73, 993–1026.
- Smith, C. (2003). *Moral, believing animals: Human personhood and culture*. New York: Oxford University Press.
- Smith, T. B., McCullough, M. E., & Poll, J. (2003). Religiousness and depression: Evidence for a main effect and the moderating influence of stressful life events. *Psychological Bulletin*, 129, 614–636.
- Stark, R. (2002). Physiology and faith: Addressing the “universal” gender difference in religious commitment. *Journal for the Scientific Study of Religion*, 41, 495–507.
- Stark, R., & Finke, R. (2000). *Acts of faith: Explaining the human side of religion*. Berkeley: University of California Press.
- Stolzenberg, R. M., Blair-Loy, M., & Waite, L. J. (1995). Religious participation in early adulthood: Age and family life cycle effects on church membership. *American Sociological Review*, 60, 84–103.
- Terman, L., Sears, R., Cronbach, L., & Sears, P. (1990). Terman Life Cycle Study of Children with High Ability, 1922–1986 [Data file]. Cambridge, MA: Henry A. Murray Research Center, Radcliffe Institute for Advanced Study, Harvard University.
- Warner, R. S. (1993). Work in progress toward a new paradigm for the sociology of religion in the United States. *American Journal of Sociology*, 98, 1044–1093.
- Wink, P., & Dillon, M. (2001). Religious involvement and health outcomes in late adulthood: Findings from a longitudinal study of women and men. In T. G. Plante & A. C. Sherman (Eds.), *Faith and health* (pp. 75–106). New York: Guilford Press.
- Wink, P., & Dillon, M. (2002). Spiritual development across the adult life course: Findings from a longitudinal study. *Journal of Adult Development*, 9, 79–94.

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