Religious Ambivalence, Liminality, and the Increase of No Religious Preference in the United States, 2006-2014

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Word count: 4,061

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Abstract

Americans identified less and less with organized religion over the past two decades. Yet apparently, many people who no longer identify with a religion are not consistently non-religious. Reinterviews reveal that many people who express no religious preference in one survey name a religion when asked the same question in a subsequent interview. Past research called this phenomenon a "liminal" status. This paper improves estimates of liminality by using three interviews and a better statistical model. About 20 percent of Americans were liminal in recent years,10 percent were consistently nonreligious, and 70 percent were consistently religious. Falling religious identification in cross-sectional data over the last three decades reflects slow change in religious identity, but some of the rise of the nones is due to more liminals saying they have no religion. Liminals appear equally among people raised conservative Protestant, mainline Protestant, or Catholic.

Introduction

Sociologists of religion routinely classify people as either religious or not. Religious people identify with a specific religion; nonreligious people identify with no religion. Lim, MacGregor, and Putnam (2010) raised the prospect that some people might be in-between: committed neither to a particular religion nor to having no religion. They noted that many people expressed no religious preference in one survey then named a religion when asked the same question in a reinterview. They labelled this in-between status "liminal," from the Latin *limen* for "threshold." Standing on the threshold of organized religion, liminals, when asked about their religion, either enter by declaring a religious preference or step outside by stating no religious preference.

The liminal orientation is hidden in cross-sectional data when the question is posed in the usual way, as in the General Social Survey (GSS) question: "What is your religion, would that be Protestant, Catholic, Jewish, no religion, or something else?" (Smith, Marsden, Hout, and Kim 2015). Liminality only becomes visible when data provide multiple answers from the same person, as in panel data. A person with a definite religious orientation can be expected to give the same answer — the name of a specific religion — every time the question is asked; a person committed to having no religion can be expected to answer consistently, too — in this case saying "no religion." A person with a liminal orientation might state a religious preference during one of the interviews but say "no religion" during another interview. "[W]e found that religious nones comprise two distinct groups: one whose members consistently claim no religious preference and the other whose members do so in one wave [of a panel study] but choose something else at another time, despite that they did not appear to have experienced significant religious changes

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between the waves" (Lim et al., 2010, p. 613).

Committed nones and liminals were roughly equal parts of the U.S. adult population in the mid-2000s — 10 percent each — according to calculations from two-wave panel data in Lim et al. (2010). About 16 percent of adults stated no religious preference in the mid-2000s; the sum of committed nones and liminals exceeded 16 percent because, in any given survey, some of the liminals will declare a religious preference and the rest will not. The calculations in Lim et al. (2010) were crude; they counted all inconsistency as liminality, though some might, be real change while failing to count liminality that might, by chance, be hidden among consistent responses. This paper improves on their estimates by using three-wave panel data and specifying a latent class model to analyze it.

To begin, think of liminality is a special case of response inconsistency, a phenomenon known to scholars of social attitudes for decades and famously formalized by Converse (1964). Many people give inconsistent answers in panel studies. Some people accurately report a real change in their status or attitude, some questions elicit unreliable responses because they are confusing or refer to obscure things, and some people vary in their commitment to their first answer. Liminality is a special case of this third source. Separating real change (the first) from unreliable questions (the second) and ambivalent people (the third) requires at least three waves of panel data and a statistical model designed to make the distinctions.[1]

Philip E. Converse (1964) gave a particularly influential expression to the idea that some people may be inconsistent. He declared that some people have attitudes and some do not. Some issues are just too complicated for some people; other issues may be simpler but obscure so some

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[1]Even three waves may not be sufficient if, for example, a substantive debate requires deciding whether the latent trait is continuous or discrete (Duncan et al., 1988).

people ad lib an answer. Under either of these conditions, people with attitudes answer consistently and with certainty; others offer an answer despite their lack of an attitude but do so with considerable uncertainty. According to Converse those who answer despite uncertainty cloud social survey data with their "nonattitudes." With a second answer, a researcher can estimate the prevalence of fixed attitudes and non-attitudes. Two-waves of panel data can detect uncertainty but cannot distinguish between real change and uncertainty. A third answer provides crucial evidence about the prevalence of nonattitudes (Duncan et al., 1988).

This paper adapts the Converse model of nonattitudes to the study of religious identities, including liminality. Three-wave panel data collected between 2006 and 2014 allow that model to estimate the (1) the relative prevalence of religious, liminal, and nonreligious identities, (2) short-term trends in each, (3) the probability that a person with a liminal orientation will say she prefers no religion, and (4) the short-term trend in that probability. The results confirm the key elements of the original research by Lim et al. (2010).

A Latent Class Model

Lim et al. (2010) established that liminals probably exist by showing that almost as many people followed an answer of "no religion" with some religion as switched from some religion to no religion in a second interview. If liminality works as they say it does, though, their estimate of 10 percent might be too low. Let p be the probability that a person with a liminal orientation answers "no religion" when asked a question like the GSS question quoted above or the one Pew Research uses (Cooperman et al., 2015). Let the probability of liminals naming a religion be $1 - p$. If enough time passes between waves of a panel, we can reasonably assume that people forget their first answer when the question comes up again, making the two answers statistically independent.

Under these conditions, we would expect some liminals to give different answers; that works out to be $2p(1 - p)$. On the other hand, some liminals can be expected to give the same answer twice, purely by chance. For each person with a liminal orientation, the probability answering "no religion" twice in two waves of a panel is p^2 and the probability of naming a religion both times is $(1 - p)^2$ (among liminals). In the aggregate, we can expect $p^2 + (1 - p)^2$ liminals to give consistent answers by chance.[2] To illustrate, suppose $p = .3$, then in two waves of data, 21 percent of the liminals can be expected to answer that they prefer no religion in the first wave and express a religious preference in the second, 21 percent to go from a preference to no preference, 49 percent to consistently state a preference for some religion, and 9 percent to consistently state a preference for no religion. In this illustration, 58 percent of the liminals are hidden among the people who gave consistent responses. Considering the full range of p between .01 and .99 reveals that at least half of liminals are hidden among the consistent answers (when $p = .5$) and as many as 98 percent may be hidden (when $p = .01$ or $p = .99$).

These illustrative calculations used a constant p. If liminals become more likely to say they have no religion over time, as Lim et al. (2010) hypothesize, then we have to put a time stamp on p, using a subscript t. If p_t increases as t increases, then expected moves from some religion to no religion will exceed expected moves from no religion to some religion, even if the nonreligious population does not increase.

To this point we have not considered any substantive changes, even though most of the literature assumes that is all that is going on (Putnam and Campbell, 2010; Hout and Fischer, 2002, 2014). If that prevailing point of view is correct, then some of the inconsistent responses reflect change, not liminality. The cross-sectional data imply that stating no religious preference

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[2]If p is either zero or one the chance element disappears and liminality disappears with it.

increased at about one-half of one percentage point per year since the late 1980s (Hout and Fischer, 2014). If real changes dominated, the estimate of liminality in Lim et al. (2010) would be too high.

To improve on Lim et al. (2010), we need a statistical model that can separate liminality from real change. Research on political "nonattitudes" provides a plausible model. Converse (1964) long ago posited that some people lack fixed views on many issues of the day. When asked to agree or disagree with a proposition in a survey, people with nonattitudes respond at least partly by chance, just as Lim et al. (2010) say liminals do when asked about religion. Duncan (1985), Brody (1986), and Duncan et al. (1988) formalized Converse's ideas about nonattitudes, and I will use a model based on their work to estimate the prevalence of liminality and the (possibly increasing) probability that liminals will answer "no religion" when asked.

The Converse model supposes that there are three kinds of people in the population: people with fixed views of one type, people with fixed views of the opposing type, and people who do not have fixed views. Here, consider people to be religious (label them with an "r"), nonreligious (labelled "n," and liminal (labelled "l"). Religious people (r) always answer questions about their religion with the name of a religion. Nonreligious people (n) always answer "no religion." People who have a liminal orientation to religion (l) name a religion sometimes and say "no religion" at other times. We use the notation in Duncan et al. (1988) to represent the prevalence of each group: π_r is the proportion of the population that has a specific religious preference, π_n is the proportion who prefer no religion, and π_l is the proportion who are liminal. As everyone has to be in one of these three categories, $\pi_r + \pi_n + \pi_l = 1$, so knowing two of the proportions implies the third one, as in $\pi_l = 1 - \pi_r - \pi_n$. Liminals say "no religion" with probability p_t and name some religion with probability $(1 - p_t)$, where t indicates the year the

interview took place ($t = 2006, 2008, \ldots, 2014$, in the GSS panel data analyzed here).

Asking people their religion in three waves of a panel study and coding their response as some religion and no religion at each occasion yields eight possible response patterns. The expected count for each response pattern can be expressed as a function of the three πs and the three p_ts as shown in Table 1. Each row also has three counts, showing the number of people observed for that response pattern in each of the three GSS panels.[3]

(Table 1 about here)

Each GSS panel consists of three interviews with a sample of adults living in representative households. The first panel began in 2006 with 2,000 persons drawn at random from the 2006 GSS and reinterviewed in 2008 and 2010. The second one began in 2008 with all the respondents from the 2008 GSS; they were reinterviewed in 2010 and 2012. The last one started in 2010 with all the respondents from the 2010 GSS; they were reinterviewed in 2012 and 2014. Each began with about 2,000 respondents of whom 1,276, 1,295, and 1,304 completed all three waves; 724, 728, and 740 people dropped out, died, emigrated, or moved to a residence that was not a household (for example, military barracks or a nursing home) and were dropped from this analysis. See Smith and Son (2011) for some details about people who dropped out of the first two GSS panels. The sample sizes for this analysis — 1,260, 1,278, and 1,294 — are slightly smaller than the number of interviews due to nonresponses to the religion question. I made no attempt to attribute religions to the 16, 17, and 10 cases that had a missing response in one of the waves.

The model is overidentified. With one three-wave panel, there are eight combinations of the two possible outcomes but only five independent parameters to be estimated (two of the three

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[3]The counts in Table 1 used no sampling or poststratification weights.

πs and the three p_ts); with the additional constraint that the sum of the expected counts equal the sum of observed counts, the model leaves two degrees of freedom for testing its fit to the data. With three overlapping panels measured at five discrete time points, we gain additional degrees of freedom and statistical power because information about p_{08}, p_{10}, and p_{12} comes from more than one dataset. With 24 combinations of the two possible outcomes, seven parameters of interest (two of the three πs and five p_ts), and three additional parameters to ensure that the sum of expected counts for each $2{\times}2{\times}2$ table equals the observed total for that table, fitting the model leaves 14 degrees of freedom.

Fitting latent class models usually requires specialized software, but Converse's model is equivalent to a loglinear Rasch model (Duncan et al., 1988) that can be fit with conventional software.[4] Duncan et al. (1988, p. 1308) provide formulas to transform the exponentiated Rasch parameter estimates into estimates of the πs and p_ts.[5]

Hypotheses

Lim et al. (2010) hypothesized that the proportion of Americans with no religion grew, in part, because people with a liminal orientation became more likely to say "no religion" in recent years. In the terms of the Duncan et al. (1988) model, that amounts to hypothesizing that $\hat{p}_{06} < \hat{p}_{08} < \hat{p}_{10} < \hat{p}_{12} < \hat{p}_{14}$. Furthermore, if there is no increase in $\hat{\pi}_n$ across the three panels, then we can say that changing behavior among liminals accounted for all of the increased

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[4]I used `Stata`.

[5]The nonlinear transformation from the parameters of the Rasch model to those of the latent class model does not work for the standard errors, unfortunately. I report Rasch model estimates and standard errors as supplementary material at the end of this paper to give an indication of precision.

preference for no religion observed in the cross-sectional data (Hout and Fischer, 2002; Cooperman et al., 2015).

The alternative hypothesis would be that the cross-sectional increases in no religion came instead from an increase in either the proportion of confirmed nones (π_n) or the proportion with a liminal orientation (π_l) or both. Most people writing about "the rise of the nones" have assumed that π_n increased (e.g., Hout and Fischer (2002); Putnam and Campbell (2010); Cooperman et al. (2015); Hout and Fischer (2014)).

Results

The GSS panel data counts in Table 1, when converted to annual percentages, replicate the cross-sectional finding that, with each passing year, more Americans preferred no religion. Of the people interviewed in 2006, 14 percent had no preference. That rose to 16 percent in 2008, 17 percent in 2010, 19 percent in 2012, and 21 percent in 2014. The data also confirm that an even larger percentage preferred no religion at least once in three interviews. In the 2006-08-10 panel, 23 percent said "no religion" at least once; that rose to 24 percent in the 2008-10-12 panel and 28 percent in the 2010-12-14 panel. The fact that the percentages who ever prefer no religion exceed the percentages who prefer no religion at any given time confirm that some liminals exist, but we cannot infer that their prevalence from the difference. Nor can these percentages adjudicate between the hypothesis that liminals became more likely to say no religion in recent years and the hypothesis that more Americans became confirmed in a nonreligious identity. For that, we turn to the latent class results in Table 2.

(Table 2 about here)

Before trying to interpret the modeling results, it is important to assess how well the

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model fits the observed counts. The answer is "very well." Chi-square tests for the difference between the observed frequencies and those expected under the latent class model are not significant for the general version of the model (L^2 = 21.55; X^2 = 22.39; df = 14). The general model estimates change with four year-specific parameters. We can simplify that model and improve statistical power by reducing that to two year-specific parameters: one for 2006 and one for 2014, each measured relative to the pooled effect for 2008, 2010, and 2012. The simplification saves two degrees of freedom and costs less than two chi-squared points so it is considered to be a reasonable improvement by usual standards of goodness of fit (ΔL^2 = 1.81; df = 2, p > .10). Substantive discussion will be based on the parameter estimates from the simplified model.

The proportion of American adults in the religious class decreased across the three panels by five percentage points from 72 percent to 67 percent. That is substantial change in just eight years, the same magnitude as the five percentage point increase in Americans' preference for no religion between 2006 and 2014. Declining attachment to organized religion was split between rising liminality and non-religiousness; the proportion liminal increased by two percentage points, and the proportion nonreligious increased by three percentage points. A rising propensity among liminals to express a preference for no religion also contributed (that propensity increased ten points, from .33 to .43).[6]

These results confirm the main insight in Lim et al. (2010): some Americans are ambivalent about organized religion and over time they became more likely to prefer no religion

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[6]The increased propensity among liminals to prefer no religion is statistically significant. Comparing the simplified model to a "no change" model that stipulates that $p_t = p^*$ for all t, results in rejection of the no change model. The no change model leaves significant residual variation (L^2 = 40.89; df = 18; p < .05), and is significantly worse than the simplified model (ΔL^2 = 17.53; df = 2, p < .01).

over naming one. To Lim et al. (2010), these results add precision, showing that liminals were actually twice as numerous as Lim et al. (2010) thought, and slightly more numerous over time. The results also confirm that an increase in the percentage of Americans confirmed in a nonreligious identity also increased, confirming the prevailing interpretation of the cross-sectional evidence (Hout and Fischer, 2014), but at a slower pace than the cross-sectional data suggest.

Denominational Roots of the Liminal

Hout and Fischer (2002) and Cooperman et al. (2015) considered the religious origins of the religiously unaffiliated, using cross-sectional data to calculate the percentage of people raised in each tradition who now have no religious preference. We can sharpen our view of liminals by comparing people with different religious origins. Table 3 shows the results for the simplified model applied to people raised in a conservative Protestant denomination, a mainline Protestant denomination, or in the Roman Catholic Church.[7]

Table 3 about here

A greater proportion of people raised in conservative Protestant denominations or as Catholics share a consistent religious identity than among those raised in mainline Protestant denominations. The percentage religious declined for all three origins by between 3 and 7 percentage points. Liminals were roughly 20 percent of each group, perhaps a percentage point or two less than in the general population (there is not enough data to infer a significant difference). The nonreligious were a significantly lower share of the conservative Protestant group (4 or 5 percent) than of the other two (5 to 12 percent, depending on panel and denomination).

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[7]The conservative denominations are those designated "fundamentalist" in the GSS codebook (Smith et al., 2015) plus people who said that they were raised "Christian."

Liminals varied in their propensity to say no religion, depending on the religion they were raised in. Those raised conservative Protestant were significantly less likely to say no religion ($p_t \approx .33$) than were those raised mainline Protestant ($p_t \approx .38$); liminals raised Catholic were most likely to say no religion ($p_t \approx .40$).

Small sample size precluded a detailed analysis of persons who were raised without religion,[8] but a further simplified analysis (not shown in the table) indicates that people raised with no religion are quite distinct. Not surprisingly, substantially more people raised with no religion fell into the nonreligious class; the surprise was that less than half — 41 percent — did so. Over one-third (36 percent), were liminal, and the remaining 24 percent adopted a consistently religious identity despite having been raised without one. Among liminals, only one-third stated a preference for no religion.

Belief and Behavior Related to Liminality

Hout and Fischer (2002) emphasized that the trend away from organized religion involved a relatively new kind of person, the "unchurched believer." They (Hout and Fischer, 2014) and Lim et al. (2010) revisited that discussion in subsequent research. Three-wave panel data can potentially help clarify this discussion as well. The Rasch model on which the latent class analysis rests, gives people a score on the latent variable ("religiosity," defined as consistent identification with a religion), one point for each time the person names a religion. In this part of the paper, I add to that score one point for every time a person says they are a "strong X" (where X is the religion they named as their preference). The result is a scale from 0 (said "no religion" in each of the three waves of the panel study) to 6 (said "strong X" in each of the three waves).

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[8]Only 292 persons in the three panels combined were raised with no religion.

The discussion in Hout and Fischer (2002) and Lim et al. (2010) referred to belief in God, belief about the Bible, and attendance at religious services as key indications of religiosity relevant to potentially being an unchurched believer. Figure 1 displays the answers to those three questions (see Hout and Fischer (2002); Smith et al. (2015) for the exact wording of the questions and answer options) arrayed by religiosity score for the three-wave panel data.

Figure 1 about here

Beliefs and behavior strongly correlate with the religiosity score. People who are consistently strongly religious (score 6) are far more likely than other Americans to believe in God without doubt, to believe that the Bible is the literal word of God, and to frequently attend religious services. On the other hand, about half of those who are consistently nonreligious are atheist or agnostic, three-fourths of them think the Bible is a book of fables, and the small minority of them who ever attend religious services do so about once a year. In between are the liminals and people who, though consistently religious, are not strongly so. The higher their scores, the stronger their tendency to believe in God, view the Bible as inspired (and at the higher scores, literally true), and attend religious services. They never do so to the same extent as consistently strongly religious people, but the tendency rises as the score rises.

Summary and Discussion

The liminal phenomenon first identified by Lim et al. (2010) is even more important than they realized. Hidden in cross-sectional evidence of greater estrangement from organized religion are many people, roughly one-in-five adults, who are not committed to being religious or nonreligious. Lim et al. (2010) estimated that the liminal population was about the same size as the nonreligious population; findings here double that estimate to about two liminals for every

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committed nonreligious person. Lim et al. (2010) underestimated the prevalence of liminals in part because liminals say they prefer a specific religion more often than not. They also underestimated the prevalence of liminals because some liminals gave consistent answers by chance (more of a risk with two-wave panel data than with three-wave panel data).

Though more prevalent than originally thought, liminality is not increasing much, just two percentage points from 2006 to 2014. Nor are liminals more likely to say they have no religion than not; they name a religion about 60 percent of the time.

Liminality is, by definition, not an identity. Liminals do not identify. They perch on the threshold, saying one thing in one survey and something else in another survey.

In extending and further specifying the idea of liminality, this research puts more pressure on the standard binary of sociology of religion. Most Americans are religious in some consistent way, some are consistently nonreligious, but about 20 percent are liminal, lacking in any consistent orientation to religion. Some are unchurched believers (Hout and Fischer, 2002); some are married to people committed to a religious identity (Lim et al., 2010). As they stand on the threshold between religious and nonreligious, nothing in the logic of their position or the evidence at hand foreordains that they will eventually step in the direction of being nonreligious. Two key observations point the other direction, toward a religious identity. Liminals are more likely to name a religion than not. A minority of persons raised with no religion displayed a consistent nonreligious identity as adults; a third of them were liminal and a quarter of them were consistently religious. The net change in the United States over the last twenty-five years has been away from organized religion, but focusing on the net change misses substantial flux that moves both toward and away from organized religion.

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Table 1. Religious Preference Response Patterns in Three-Wave Panel Studies, Formal Expression of the Expected Frequencies for the Model, and Observed Frequencies by First and Last Year of the Panel: Adults, United States, 2006-2014

				Observed count		
				First and last year of panel:		
Answer in wave:				2006-	2008-	2010-
1	2	3	*Formal Expression of the Model*	2010	2012	2014
Some	Some	Some	$N[(1 - p_1)(1 - p_2)(1 - p_3)\pi_l + \pi_r]$	966	965	933
Some	Some	None	$N(1 - p_1)(1 - p_2)p_3\pi_l$	43	36	51
Some	None	Some	$N(1 - p_1)p_2(1 - p_3)\pi_l$	33	35	41
Some	None	None	$N(1 - p_1)p_2p_3\pi_l$	36	23	34
None	Some	Some	$Np_1(1 - p_2)(1 - p_3)\pi_l$	39	38	30
None	Some	None	$Np_1(1 - p_2)p_3\pi_l$	19	18	20
None	None	Some	$Np_1p_2(1 - p_3)\pi_l$	24	15	22
None	None	None	$N[p_1p_2p_3\pi_l + \pi_n]$	100	148	163
Total				1,260	1,278	1,294

Notes: N is sample size, p_t for $t = 1, 2, 3$, is the probability a person with a liminal orientation will answer "no religion," π_l is the proportion of the population that has a liminal orientation, π_r is the proportion of the population that answers with the name of a religion with certainty, and π_n is the proportion of the population that answers "no religion" with certainty.

Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).

Table 2. Estimates of Parameters of General and Simplified Model by Years of Panel: Adults, United States, 2006-2014

Quantity of interest	Symbol	General model			Simplified model		
		Years of panel			Years of panel		
		2006-2010	2008-2012	2010-2014	2006-2010	2008-2012	2010-2014
Composition:							
Religious	π_r	.72	.70	.67	.72	.70	.67
Liminal	π_l	.20	.21	.22	.20	.21	.22
Not religious	π_n	.08	.10	.11	.08	.09	.11
If liminal, probability of "no religion":							
2006	p_{06}	.34	—	—	.33	—	—
2008	p_{08}	.38	.38	—	.38	.38	—
2010	p_{10}	.36	.36	.36	.38	.38	.38
2012	p_{12}	—	.40	.40	—	.38	.38
2014	p_{14}	—	—	.43	—	—	.43
Goodness of fit:							
Likelihood ratio	L^2		21.55			23.36	
Pearson	X^2		22.39			23.58	
Degrees of freedom	df		14			16	
Number of observations		1,260	1,278	1,294	1,260	1,278	1,294

Note: The general model estimates the p_ts relative to the baseline in 2010; the simplified model constrains the p_ts for t = 2008, 2010, and 2012, to a single value, estimating only p_{06} and p_{14}.

Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).

Table 3. Estimates of Parameters of Simplified Model by Religion Raised In: Persons Raised Protestant or Catholic, United States, 2006-2014

		Religion raised in								
		Conservative Protestant			Mainline Protestant			Catholic		
Quantity of interest	Symbol	2006-2010	2008-2012	2010-2014	2006-2010	2008-2012	2010-2014	2006-2010	2008-2012	2010-2014
Composition:										
Religious	π_r	.78	.78	.74	.72	.71	.66	.78	.72	.71
Liminal	π_l	.18	.18	.20	.19	.19	.21	.17	.20	.20
Not religious	π_n	.04	.04	.05	.09	.09	.12	.05	.09	.09
If liminal, probability of "no religion":										
2006	p_{06}	.33	—	—	.37	—	—	.27	—	—
2008	p_{08}	.33	.33	—	.38	.38	—	.42	.42	—
2010	p_{10}	.33	.33	.33	.38	.38	.38	.42	.42	.42
2012	p_{12}	—	.33	.33	—	.38	.38	—	.42	.43
2014	p_{14}	—	—	.42	—	—	.47	—	—	.43
Goodness of fit:										
Likelihood ratio	L^2		23.94			21.67			17.16	
Pearson	X^2		18.90			23.32			16.37	
Degrees of freedom	df		16			16			16	
Number of observations		425	436	438	300	296	314	382	394	389

Note: The simplified model constrains the p_ts for t = 2008, 2010, and 2012, to a single value, estimating only p_{06} and p_{14}. The πs were rounded independently so some columns appear not to sum to 1.00; the unrounded numbers sum to one.
Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).

Supplementary Tables

Table S1. Rasch Model Parameter Estimates and Standard Errors by Model and Data Set: Adults, United States, 2006-2014

Quantity of interest	*Each panel separately* Model			*Three panels together* Model		
	1a	1b	1c	2	3	4
Composition:						
S_0	6.873	6.872	6.838	6.888	6.884	6.848
	(.032)	(.032)	(.033)	(.031)	(.031)	(.030)
S_1	3.749	3.580	3.381	3.605	3.665	3.636
	(.134)	(.147)	(.149)	(.086)	(.063)	(.059)
S_2	3.482	2.902	2.605	3.040	3.163	3.141
	(.227)	(.258)	(.252)	(.143)	(.082)	(.073)
S_3	4.931	4.962	4.190	4.734	4.922	4.906
	(.320)	(.341)	(.322)	(.189)	(.077)	(.054)
Year						
2006	-.249	—	—	-.098	-.206	—
	(.177)			(.126)	(.097)	
2008	-.077	-.037	—	.060	0.000	—
	(.175)	(.192)		(.109)	—	
2010	0.00	0.00	0.00	0.00	0.00	—
	—	—	—	—	—	
2012	—	.072	.393	.145	0.000	—
		(.190)	(.178)	(.108)	—	
2014	—	—	.511	.283	.231	—
			(.178)	(.119)	(.087)	
Dataset						
Panel 2	—	—	—	-.025	-.018	.014
				(.043)	(.042)	(.040)
Panel 3	—	—	—	-.054	-.049	.027
				(.044)	(.044)	(.040)
Goodness of fit:						
Likelihood ratio (L^2)	4.91	1.52	0.74	21.55	23.36	40.89
Pearson (X^2)	4.82	1.54	0.73	22.39	23.58	41.29
Degrees of freedom (df)	2	2	2	14	16	18
Number of observations (N)	1,260	1,278	1,294	3,832	3,832	3,832

Note: Standard errors are in parentheses.
Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).

Table S2. Rasch Model Parameter Estimates and Standard Errors for the Simplified Model and Religion Raised In: Persons Raised Protestant or Catholic, United States, 2006-2014

Quantity of interest	Religion raised in		
	Protestant		Catholic
	Conservative	Mainline	
Composition:			
S_0	5.870	5.437	5.750
	(.052)	(.132)	(.054)
S_1	2.449	2.147	2.454
	(.112)	(.132)	(.116)
S_2	1.744	1.649	2.133
	(.159)	(.171)	(.146)
S_3	2.943	3.441	3.743
	(.169)	(.159)	(.145)
Year			
2006	.000	-.045	-.675
	(.193)	(.194)	(.201)
2008-2010-2012	0.000	0.000	0.000
	—	—	—
2014	.389	.365	.036
	(.173)	(.177)	(.166)
Dataset			
Panel 2	.026	-.021	-.056
	(.071)	(.088)	(.076)
Panel 3	-.116	-.032	-.075
	(.073)	(.090)	(.077)
Goodness of fit:			
Likelihood ratio (L^2)	23.94	21.67	17.16
Pearson (X^2)	18.90	23.32	16.37
Degrees of freedom (df)	16	16	16
Number of observations (N)	1,299	910	1,165

Note: Standard errors are in parentheses.

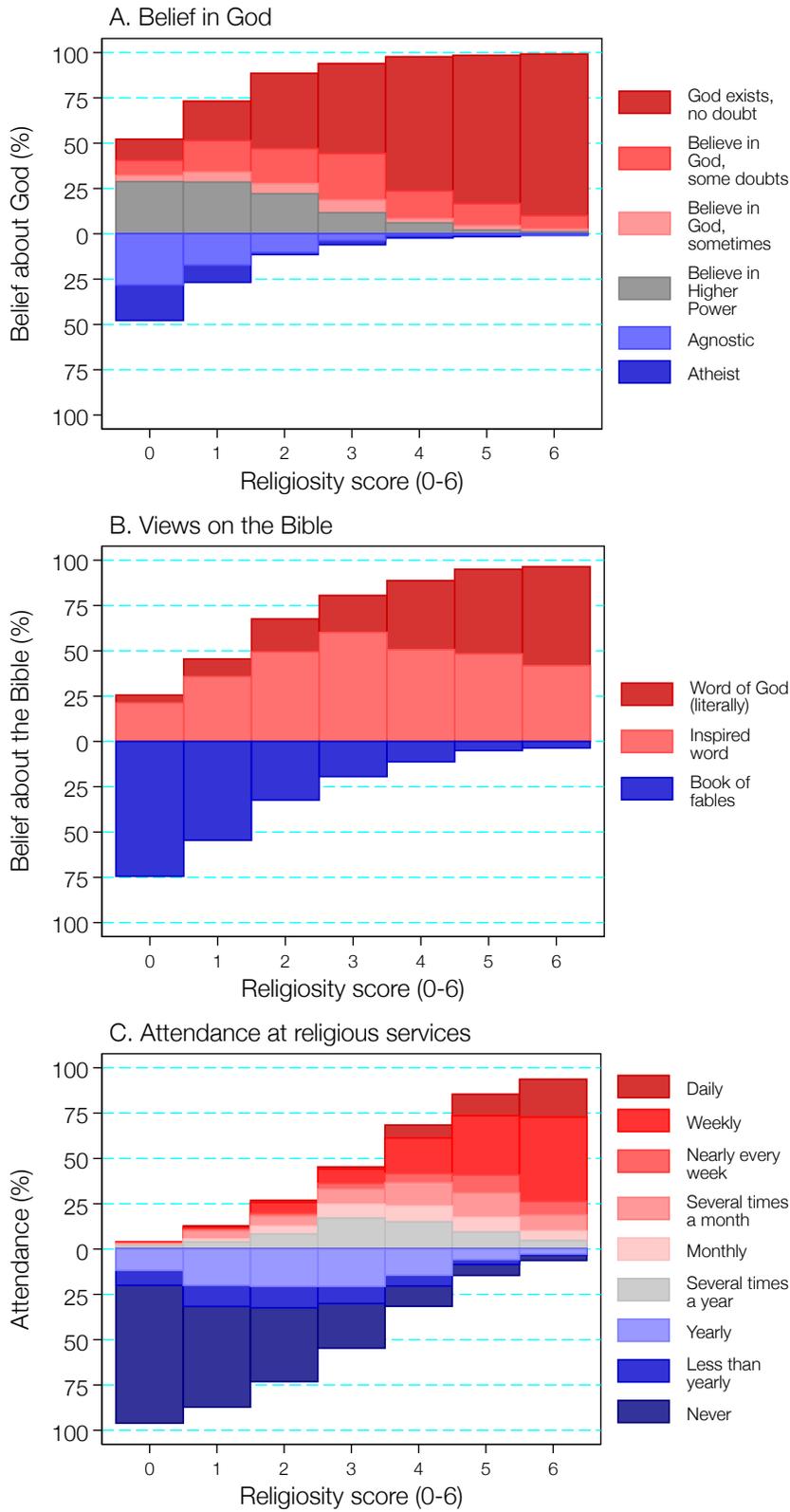Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).

Figure 1. Religiosity Measures by Religiosity Score
Source: Authors' calculations from the General Social Survey Panels (Smith et al., 2015).