On religious ambiguity: Childhood family religiosity and adult flourishing in a twin sample

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ABSTRACT

Ambiguity is an important notion in sociology, denoting situations where social actors and groups carry on without shared meaning. The current article applies this concept to the context of religiosity during people's upbringing, recognizing that multiple factors make family-level religion a complex experience. Indeed, though recent research portrays household religiosity in childhood as a sociocultural exposure with long-term implications for well-being, existing studies have yet to incorporate multiple inputs to consider the cohesiveness of that exposure. Using twin data from a national sample, we investigate whether consistency in recalled household religiosity is associated with mid-life flourishing. Multi-level linear regression models reveal that similarity in twin reports matter, above and beyond the actual level of religiosity individuals report and net of dis/similarity across other childhood recollections. We conclude that coherence in religious upbringing—whether religion was understood to be important or not—is a key ingredient for thriving later in life and then reflect more broadly on manifestations of sociocultural ambiguity in families and in larger social units.

1. Introduction

There is now considerable evidence that religious people enjoy relatively high well-being across many outcomes (Koenig et al. 2012). Researchers taking a life course view, moreover, demonstrate that the protective effects of religion span back to childhood, much the same as other early life exposures such as socioeconomic conditions or neighborhood dis/advantage influence adult health (Hayward and Gorman 2004; Vartanian and Houser 2010). Though religion's "long arm" is contingent and modifiable, the religious context of one's childhood home is nevertheless linked decades later to mental health, mortality, chronic disease, health behaviors, cognitive health, and overall flourishing (Upenieks et al. 2021; Upenieks and Schafer 2020; Upenieks et al. 2021; Upenieks and Thomas 2023; Upenieks and Zhu 2023).

Yet existing studies on childhood religion and later-life well-being make an important, untested assumption: that one person's report is sufficient to adequately convey this family-level exposure. Two long-running panel surveys, the National Longitudinal Survey of Youth (NLSY79) and Panel Study of Income Dynamics (PSID), provide reports from the child or the parent on early life religiosity, enabling researchers to prospectively document how church attendance or religious importance (intensity of belief) predict a range of later health outcomes (Chiswick and Mirtcheva 2013; Pope et al. 2014). Studies using the Midlife Development in the United Study (MIDUS), by contrast, have relied on participants' recollections about religion's importance in their childhood household (Upenieks

et al. 2021a; Upenieks et al. 2021b). Neither of these designs, however, have been used to obtain *different inputs* on the religious nature of the family from multiple members, ruling out concordance or discordance across multiple reports.

As we argue in the current paper, multiple reports could be helpful for indicating the coherence of a complex and multifaceted sociocultural exposure such as religion. Beyond offering clues about potential measurement error, (dis)similarity in retrospective reports by two people experiencing an identical household context at the same time in their lives—twins—may give us substantive insight about family religiosity as a potentially *ambiguous* phenomenon. The main hypothesis is that correspondence between twins' recollections is associated with higher adult well-being, net the assumed positive contributions of childhood religion and concordance in other childhood-family recollections.

We operationalize well-being with *flourishing*, a multidimensional concept that integrates psychological, emotional, and social domains. Looking beyond the absence of illness, flourishing attempts to capture positive states such as meaning, social belonging, joy, and integration (Keyes 2007; Keyes and Simoes 2012)—in other words, the wholistic "experience of life going well" (Huppert and So 2013:838). Through this lens, we investigate whether there is a well-being cost to receiving "mixed signals" on matters often assigned ultimate meaning.

2. Religious ambiguity

Ambiguity is a pervasive—indeed unambiguous—feature of social life, the uncertainty arising from complexity (Kovacic and Louisa Jane Di Felice, 2019). Sociologists document that popular, seemingly uncontested concepts, such as "diversity", hide conflicted ambiguities that emerge only under pointed questioning (Bell and Douglas 2007). Ambiguity is pragmatic and often strategic; actors who cloud their intentions during questionable exchanges (e.g., bribery) can head off opprobrium (Schilke and Rossman 2018), while scientists who slide between incongruous classification schemes smooth over epistemic conflict with collaborators and preserve their cultural authority (Panofsky and Bliss 2017). And in the realm of family, researchers commonly examine how ambiguity around family boundaries or around members' roles contributes to a sense of contradiction and intensify the complex mix of solidarity and conflict characterizing family systems (Connidis 2015; Sarkisian 2006).

Building from that backdrop, the current article contends that there are multiple possible expressions for *religious ambiguity* within a family unit. We identify four relevant forms that complicate the idea of family religiosity as a straightforward early life exposure.

First, the family, as a unit, may prioritize certain aspects of religion and downplay others. This is perhaps the archetypal version of "mixed signals"—for instance, regular prayer at mealtime, but lax church attendance; enrollment at a religious school, but no discussion of religion or spirituality at home. Documenting these complex combinations of religious (non-)behavior requires an extensive battery of measures that are not available in most data sources.

Second, individual parents may differ in their affiliation, attendance, commitment, or other dimensions of religiosity. The PSID includes information from multiple parents, but to our knowledge no research on the long-term consequences of early life religiosity has incorporated parental discrepancy data.

Third, families' priorities may change over time; childhood is a duration, not a momentary experience. Accordingly, family's religious profile could have intensified, faded, or ebbed and flowed over the years. Though the Longitudinal Study of Generations survey retrospectively tracks this type of religious change over a decade among adults in their 50s and 60s (Silverstein and Bengtson 2018), we are not aware of any studies that track such spells of (dis)engagement/re-engagement prospectively or retrospectively across childhood.

Fourth, there may be cases where parent(s) claim a religious identity, but betray that identity by immoral or hurtful behavior. Religious hypocrite is challenging to measure directly with survey data, but may be an important threat to a household's religious coherence.

We suspect that each of these forms of ambiguity, on their own or in combination, leads to less flourishing later in life. First and foremost, a lack of clarity surrounding religious beliefs or practices can be disorienting and disruptive for children's development. As with other formative social contexts, families produce and convey cultural frames—lenses which explain how the world works—and cultural scripts—templates for expected behavior (Abrutyn et al. 2020; Benford and Snow 2000; Harding 2007). Particular contexts vary in the extent to which these cultural objects are uniform and widely-shared versus mixed and enigmatic by group members; groups whose culture leans toward the heterogeneity side send weaker signals about what life pathways are optimal or desirable (Harding 2007). Families marked by shared norms, values and expectations, on the other hand, appear best suited for launching young people into the challenges of adulthood (e.g., Anthony and Stone 2010; Pruett and Pruett 2009; Wickens and Greef 2006).

Relatedly, religious accord, marked by norms of expected (non)religious behavior and practice, tends to foster positive intergenerational relationships between parents and children (Pearce and Axinn 1998), a central component of later life flourishing (Chen et al. 2019). Religious discord, by contrast, can promote frustration and an environment of heightened conflict, ultimately inscribing "normal" conflict with religious meaning.

Though speaking less directly to the role of childhood socialization and development, two other streams of research hint to how religious ambiguity versus coherence may relate to adult flourishing. First, studies building on the "dark side of religion" framework—referring to the pernicious mental health consequences of religious doubt, uncertainty, and disaffiliation (Ellison and Lee 2010; Hill et al. 2021; Upenieks 2021)—suggest that being "all in" or "all out" on religion is preferable to occupying a tenuous middle ground (Fenelon and Danielsen 2016; May 2018). This inner, psychological form of religious ambiguity in adulthood could, in fact, represent an outgrowth of ambiguous religious socialization, though we are unaware of any evidence documenting that precise longitudinal process. Second, religious commonality among marital dyads is linked to better individual health than is discordance in belief and practice (Lichter and Carmalt 2009; Upenieks et al. 2022). The well-being of individuals across a range of ages may be attuned to

religious dis/harmony in their familial context, whether the alignment is governed by parental, caregiving figures or in relation to a spouse.

3. Approach of the current article

This article relies on wholistic retrospective reports of religious importance, an approach intended to capture the coherence of religiosity as a childhood experience. The retrospective reports are obtained independently from twins and offer a dyad-level understanding of family religiosity. Our assumption is that higher/lower concordance within a given twin pair signals lower/higher levels of religious ambiguity for someone growing up in that household.

The current strategy does not pinpoint which of the four features of ambiguity (identified above) drives dyadic discordance in perceived childhood family religiosity. Still, by sidestepping parental reports of religiosity (whether measured prospectively or retrospectively), our approach leans into the child's overall understanding of religion in their home, which may be more important for later-life outcomes than what one or both parents say about discrete behaviors or mere affiliation. For instance, if a mother was the guiding presence in the home and she attended church regularly while the father played Sunday golf, it may be most relevant to know that she made the household a highly religious place—this despite a discrepancy score between mother's and father's self-reports of church attendance.

Relying on retrospective summary reports of religious importance, however, raises the possibility that discordances are nothing more than measurement error. A discrepancy may mean that the "true" religion of the family is somewhere between two response options in an ordinal scale, or that one member of the twin dyad misremembers or is biased in their recollection. It will therefore be important to account for how twins' recollections are (mis)matched along a variety of dimensions in order to isolate the role of religious dis/similarity.

4. Method

4.1. Sample

The current study uses data from the MacArthur Foundation Survey of Midlife Development in the United States (MIDUS), a national study launched to understand the interplay between social environments and diverse aspects of well-being over the life course. The MIDUS project began in 1995 with a nationally representative sample of non-institutionalized individuals aged 25–74 in the continental United States. MIDUS respondents were initially interviewed by phone, then received a self-administered questionnaire (SAQ) to be returned by mail. A twin subsample, featuring an identical phone and SAQ survey protocol, was derived from the main MIDUS sample by screening approximately 50,000 households by telephone survey to determine whether anyone had a twin within the same age range as an immediate relative (Keyes 2002; Kessler et al. 2004). Nearly 15% of contacted respondents indicated that they had a relative who was a twin. Sixty percent of those identified by this method then consented to participate in a twin-based study. The final response rate for complete twin interviews was approximately 26% (i.e., two twins in a pair were successfully reached by interviewer, both provided consent, and both completed a zygosity screening questionnaire).[1] In all, 1914 individuals participated in the survey after undertaking the screening questionnaire. We removed an additional 73 cases where records could not be matched to identify twin pairs due to unclear birth year records; we also focus our attention on twins, so we removed 7 identified as part of triplets and quadruplets. Among this set of respondents, 137 failed to return their SAQ (7.5%), which contained multiple measures used in the current study. Finally, 3.5% of the remaining sample had missing scores on one or more study variables. Therefore, the analytic sample comes to 1631 once we dropped cases missing on any study variables. This analytic sample is slightly older, whiter, more female, and more educated than the original twin sample.

4.2. Dependent variable

We use the concept of flourishing to understand adult well-being in a wholistic manner. Building from Keyes (2002), we derive an overall flourishing score from three subdomains of emotional, psychological, and social well-being measured in the MIDUS survey (see Keyes 2002; Keyes and Simoes 2012). Emotional well-being included (a) a six-item scale of positive affect (Crawford and Henry 2004) assessing whether people felt happy, calm, etc. over the past 30 days, and (b) a one-item measure of life satisfaction (measured 0–10). We standardized all scores because positive affect and life satisfaction were measured on different scales. Standardized scores were then summed to create an index of emotional well-being ($\alpha = 0.72$). Psychological well-being was assessed with an 18-item index developed by Ryff (1989). The 18 items, all measured on the same 1 (strongly agree) – 7 (strongly disagree) scale, tap (a) self-acceptance ("When I look at the story of my life, I am pleased with how things have turned out"), (b) personal growth ("It is important to have new experiences that challenge how I think about myself and the world"), (c) positive relations with others ("People would describe me as a giving person, willing to share my time with others"), (d) purpose in life ("Some people wander aimlessly through life, but I am not one of them"), (e) environmental mastery ("In general, I feel I am in charge of the situation in which I live") and (f) autonomy ("I have confidence in my own opinions, even if they are different from the way most other people think"). We

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[1] As previous authors have noted (e.g., (Lundborg 2013), the twin sample is more female, more white, and slightly younger than the RDD sample.

standardized and summed the items ($\alpha = 0.71$). Finally, social well-being was assessed by a 15-item index developed by Keyes and Simoes (2012). This index captures (a) social acceptance ("I believe that people are kind"), (b) social contribution ("I have something valuable to give to the world"), (c) social actualization ("The world is becoming a better place for everyone"), (d) social coherence ("I find it easy to predict what will happen in society") and (e) social integration ("I feel close to other people in my community"). As with the other subdomains, we standardized and summed the 15 items ($\alpha = 0.74$).

We follow the procedure proposed by another recent study on the early origins of adult flourishing (Chen et al. 2019), summing the standardized emotional, psychological, and social well-being subdomain values to produce one overall flourishing score. The score ranges from -6.1 to 4.38, reflecting a moderate left skew. That said, only 4% of cases fell beyond -2 standard deviations from the mean. Supplementary analyses also used an unstandardized flourishing score, which simply averaged the emotional, psychological, and social well-being indexes, and results were unchanged.

4.3. Independent variable

The main explanatory variable comes from childhood religiosity recollections. All respondents were asked, "How important was religion in your home when you were growing up?" Response options were: (1) "Very important," (2) "Somewhat important," and (3) "Not very important," and (4) "Not at all important." Overall, the sample tended to report high levels of childhood religiosity, 43% endorsing the highest level, while about 20% said it was not at all or not very important in their upbringing. The recommended model specification for dyadic (dis)similarity (discussed below) relies on information about variable means, so main analyses will treat twins' reports as quasi-continuous numeric scores. Supplementary analyses, however, will examine them in categorical form.

4.4. Other childhood recollections and Twin concordance

It is important to account for other features of the childhood home that may overlap with religiosity and go on to affect adult well-being. For one, issues like household socioeconomic status or family structure may be confounders of the association between religion and flourishing. Second, because childhood variables are measured retrospectively, we are able to discern whether discordance in perceived religiosity corresponds with discrepancies in other domains of family life. Accounting for generalized concordance within a twin pair, then, provides a way to isolate the relevance of (dis)similarity in religion scores.

We incorporate a diverse array of variables measuring childhood conditions and events. These include variables measuring individual level experiences, namely whether the child experienced physical abuse (e.g., mother, father "kicked, bit, or hit you with a fist", average frequency from "never to often") and whether their own relationship with parents(s) was warm and nurturing (based on a 4-item index, averaged for both parents, with items such as "how much love and affection did she [he] give you?", alpha = 0.88). Both variables, referring to the period when MIDUS respondents "were growing up", are strong predictors of adult well-being in previous studies (Andersson 2016; Upenieks et al. 2021).

Another set of variables addresses what happened during childhood at the family-level. This includes (1) number of moves to a new neighborhood or town, (2) description of residential area (rural, small town, medium-sized town, suburbs, city, moved around), (3) whether both biological parents were in the home (yes/no), (4) number of siblings in family, excluding the twin, (5) whether the family ever received welfare (yes/no), (6) the family's financial standing relative to other families ("a lot better off" to "a lot worse off"), (7) and mother's highest level of education (from less than high school to college degree or higher).

In principle, each of these scores would be aligned within each twin pair, assuming perfect measurement. Therefore, besides accounting for the independent score of each respondent, we also create a twin-level summary score of retrospective concordance. This score is '1' when twins are aligned on all 7 reports, and approaches '0' the more their scores contradict. Table 1 details its construction. The concordance variable is intended to adjust for several overlapping measurement error issues—(a) various family complications that may underlie and explain religious ambiguity (e.g., genuine household instability or drastic socioeconomic mobility that defy easy categorization), and (b) the unreliability of memory.

4.5. Demographic covariates

Multivariable analyses will also adjust for respondents' age, sex, race (white vs. non-white) and zygosity (monozygotic, dizygotic, or unable to determine).

4.6. Other adult variables

It is beyond the scope of the present article to explore potential mechanisms mediating the relationship between twin-level childhood religiosity scores and adult flourishing, so we abstain from including adulthood covariates that may intervene in that association (e.g., adult socioeconomic status).[2] That said, supplementary analyses will incorporate two adulthood covariates that could conceivably influence retrospective religiosity reports. As previous research notes (Hayward et al. 2012; Upenieks et al. 2021), adults who are currently highly religious may overstate the extent to which they or their family was religious growing up. Robustness checks

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[2] On the problems induced by conditioning on post-treatment variables (i.e., overcontrol bias), see Elwert and Winship (2014). Main results, however, were unchanged when accounting for education and household income in regression models.

Table 1
Details of twin concordance scoring, Midlife Development in the United States Study (MIDUS) twin sample ($N = 1631$).

Retrospective reports	Measurement	Concordance Scoring	Average value across twin pairs	Correlation with religious concordance[a]
Moves	Count	$\text{Twin}_{\text{low score}}/\text{Twin}_{\text{high score}}$	0.75	0.08
Residential region	6 unordered categories:	1 if match; 0 if not	0.69	0.04
Both biological parents	2 categories: yes/no	1 if match; 0 if not	0.94	0.03
Number of siblings	Count	$\text{Twin}_{\text{low score}}/\text{Twin}_{\text{high score}}$	0.93	0.06
Welfare	2 categories: yes/no	1 if match; 0 if not	0.95	−0.03
Financial status	7 ordered categories:	$\text{Twin}_{\text{low score}}/\text{Twin}_{\text{high score}}$	0.83	0.06
Highest education	4 ordered categories:	$\text{Twin}_{\text{low score}}/\text{Twin}_{\text{high score}}$	0.90	0.03
Overall twin concordance score		Summed from 7 preceding items	6 (SD = 0.83)	0.09

[a] Consistent with other ordered categorical variables, religious concordance defined as $\text{Twin}_{\text{low score}}/\text{Twin}_{\text{high score}}$.

therefore incorporate reports of current religious importance (measured "not at all" to "very"). Another threat to the interpretation of religious discrepancy as signs of real ambiguity is the possibility that the twins have an antagonistic relationship and therefore reconstruct the past in contradictory ways. We therefore also consider a measure of current family strain (4 items, e.g., "how often do they [members of family not including spouse] criticize you", alpha = 0.79).

4.6.1. Analysis

The analysis begins with a general overview of the childhood recollections and how childhood religious concordance is related to general concordance/discordance within twin pairs.

The main stage of the analysis uses multilevel linear regression to examine whether (dis)similar religiosity reports are linked to lower levels of adult flourishing, net of individual's own reports. Multilevel modeling accounts for the clustering of individuals (level 1) within twin pairs (level 2) and allows inclusion of level-two variables, such as twin retrospective concordance. Models employ robust standard errors because twin observations are not independent.

Following the best-practice recommendations of Rogers et al. (2018), our preferred model specification for dyadic (dis)similarity as a predictor relies on three key terms: (1) X_{tw1} = raw childhood religiosity score, Twin 1; (2) X_{tw2} = raw childhood religiosity score, Twin 2; and (3) $Z_{\text{tw1}}\text{x}Z_{\text{tw2}}$ = the interaction term for Z-standardized scores of Twin 1 and Twin 2.[3] This interaction term's coefficient is the crucial test of how dyadic properties shape individual-level outcomes; if positive and statistically significant net of X_{tw1} and X_{tw1} main effects, $Z_{\text{tw1}}\text{x}Z_{\text{tw2}}$ indicates that pair-level agreement is associated with higher flourishing for Twin 1.

A downside of this model specification, however, is its reliance on mean-based Z scores. Retrospective religion is measured on an ordinal scale, and so an alternative model specification will incorporate twin childhood religion concordance in explicitly categorical terms (1 = reported same religiosity value; 0 = otherwise) as a level-two variable.[4]

Several additional robustness checks will be used to examine sensitivity of the results. These, described in more detail below, include different adjustment strategies for overall retrospective concordance, attention to dis/similarity in religion reports at various ends of the variable's distribution, and specifications which control for factors during adulthood that may color retrospective religiosity reports.

Total missing data on the outcome, predictor variables, and covariates were moderate (10.8%). Final models used listwise deletion, as multi-level imputation approaches for twin data remain a method in development (Sullivan et al. 2021).

5. Results

5.1. Descriptive findings

Descriptions of central tendency and dispersion for flourishing and for each individual-level covariate can be found in Appendix 1. In brief, the twin sample is predominantly white and women are slightly overrepresented. Twins tended to remember their parents as warm and caring (mean = 2.9 on 1–4 scale), and recalled physical abuse was relatively rare (mean = 1.3 on 1–4 scale).

Details about the concordance of retrospective twin reports are shown in Tables 1 and 2. Childhood religion, the variable of main interest, shows a concordance similar to some–but lower than most–other childhood reports. Specifically, 65% of the twin reports about childhood corresponded exactly, with extreme differences (e.g., "not at all" and "very" important reported by the same pair)

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[3] Unlike some dyad types (e.g., husbands-wives, supervisors-workers), twins are exchangeable (Gonzalez and Griffin 2012); therefore, the assignment of Twin 1 and Twin 2 is arbitrary within the twin pair.

[4] For clarity, we refer to the interaction term recommended by Rogers et al. (2018) as an indication of *similarity*, whereas we call *agreement* the binary condition where twin scores are matched.

Table 2
Correspondence between twins in retrospective childhood religiosity, Midlife Development in the United States study (MIDUS) twin sample ($N = 1631$).

	Twin 2				
Twin 1	Not at all	Not very	Somewhat	Very	Total
Not at all	17	30	11	1	59
Not very	30	129	95	13	267
Somewhat	11	92	357	140	600
Very	1	11	139	554	705
Total	59	262	602	707	1631

Note: Agreement Proportion: 1057/1631 = .65

Average Twin$_{low\ score}$/Twin$_{high\ score}$ = .85

quite rare (Table 2). This extent of agreement is similar to that of childhood region recollection, e.g., small town vs. suburbs (69%, Table 1), but considerably lower than concordance on whether twins lived with both biological parents or were on welfare (95% and 93%, respectively).[5] The binary indicator of agreement for religion, while not directly implemented in preferred regression specification below, will nevertheless be used in some multivariable analyses.

Childhood family religiosity can also be ordered, and so we compute the average fraction of low scores within a twin pair to high scores within pairs to examine how this measure of similarity compares to other dimensions of retrospective twin concordance. Childhood religiosity shows 0.85, higher than the concordance score for number of household moves (0.75) but lower than alignment on number of siblings (0.93) (Table 1).

Not surprisingly, twin pairs who tended to align on more childhood measures in Table 1 (as reflected by high overall twin concordance scores) had the highest levels of agreement on the religion measure. Those religiously aligned scored on average 6.03 out of 7, while those with discrepant religiosity recollections scored 5.93.

Our main hypothesis—tested below with multivariable regression—pertains to how religious similarity is linked to adult flourishing. But as a preliminary step, we also examined whether retrospective concordance in general is associated with the outcome. The zero-order correlation between overall twin concordance and flourishing was weak ($r = 0.09$).

5.2. Multi-level linear regression

Main multivariable findings are depicted in a series of multi-level regression models in Table 3. Prior to model A, we checked the reasonableness of assuming child religiosity operates as a quasi-continuous variable; an unadjusted model, excluding the lowest category of religion as reference, showed that each subsequent ordered category was associated with an approximately equal step increase in flourishing, suggesting a linear relationship. We also began by including all retrospective variables as individual-level controls (e.g., financial status, mother's education). Table 3 presents more parsimonious models because most were not statistically significant, and because these family recollections are included in the overall twin concordance scores as a level 2 variable.[6] Indeed, reports of parental abuse and warmth, conceptualized as level 1 predictors measuring personal experiences, overwhelmed the predictive power of other childhood variables.

Model A shows the preferred model specification, but without accounting for general retrospective concordance. The interaction term coefficient is positive and statistically significant, supporting our hypothesis. That is, net of each twin's own scores, higher similarity on the retrospective religion measure predicts higher flourishing as an adult. This association persists in Model B, which accounts for twins' generalized tendency to agree or not about their childhood household. The interaction term is unchanged with this addition to the model.

Model C shows an alternative way to conceptualize score alignment, not as an interaction term of mean-based Z scores, but as a categorical indicator of agreement (yes/no). This is an important point of comparison because retrospective religion is quite skewed and calls into question the validity of such Z scores. The results from this third model, which also adjusts for total retrospective concordance, remain in support of the hypothesis. Regardless of their own religiosity score, members of twin pairs who agreed on their level of childhood family religion scored 0.62 standardized units higher on the flourishing scale than those whose recollections were not aligned. Building on this way to conceptualize correspondence at the twin level (level 2), we analyzed an additional model

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[5] The relatively low levels of concordance on residential region may reflect the ambiguity of place labels, as measured in MIDUS. Survey response options include "rural", "small town", "medium-sized town", "suburbs", "city", and "moved around." The dividing line between many of these categories is not obvious, especially absent any formal designations (e.g., census bureau definitions).

[6] In this expanded model, higher levels of mother's education was linked to more adult flourishing, and growing up in a rural area was associated with greater adult flourishing than was growing up in a small or medium-sized town. Controlling for these and other retrospective reports individually, however, had no impact on twin similarity coefficients.

Table 3

Multi-level linear regression coefficients (robust standard errors) predicting adult flourishing, Midlife Development in the United States Study (MIDUS) twin sample ($N = 1631$).

	Model A	Model B	Model C
	Preferred specification	Preferred specification + overall twin concordance	Alternative specification for twin similarity
Retrospective religion			
Childhood family religiosity - twin 1 (tw1)	0.17 (0.09)	0.16 (0.09)	0.03 (0.09)
Childhood family religiosity - twin 2 (tw2)	−0.03 (0.08)	−0.04 (0.08)	−0.17 (0.09)*
Twin similarity: Ztw1 x Ztw2	0.22 (0.07) **	0.21 (0.07) **	
Twin consistency: tw1 = tw2 (yes/no)			0.62 (0.14) ***
Other retrospective reports			
Parental abuse	−0.16 (0.11)	−0.16 (0.11)	−0.15 (0.11)
Parental warmth	1.11 (.11) ***	1.11 (.11) ***	1.08 (.11) ***
Overall twin concordance, family-level measures[a]		0.16 (0.10)	0.15 (0.10)
Demographic covariates			
Age	0.02 (0.01) ***	0.02 (0.01) ***	0.02 (0.01) **
Female	0.20 (0.12)	0.20 (0.12)	0.21 (0.12)
Non-white	−0.61 (0.26) *	−0.57 (0.26) *	−0.59 (0.26) *
Constant	−4.58	−5.47	−4.85
Log pseudolikelihood	−3568.73	−3566.72	−3562.47
N	1631 (878 twin pairs)	1631 (878 twin pairs)	1631 (878 twin pairs)

Note: All models adjust for zygosity of twins and are clustered by twin identification.

***$p<.001$; **$p<.01$; *$p<.05$.

[a] Includes number of moves, residential region, whether both biological parents were in the home, number of siblings, whether family ever received welfare, family's financial standing relative, and mother's education.

including a pair-based average of childhood religiosity (not shown); the coefficient for religious agreement in this supplementary model was identical to that in Model C ($b = 0.62$).

5.3. Additional robustness checks

Table 4 contains a set of checks to scrutinize the robustness of our conclusions in Table 3. Our primary estimate from that table, Model A, is provided for reference. First, we examined whether the results held when regression estimates were probability-weighted by overall retrospective twin concordance. This approach provides another way to condition on twin-level measurement error and underlying ambiguity in family circumstances, essentially giving more importance to twin pairs whose childhood recollections most coalesced. The interaction term coefficient for twin religion similarity remained positive and statistically significant under this approach (Robustness Check [RC] 1).

The next pair of robustness checks addresses several contemporaneous issues that may threaten the validity of retrospective reports. First, does current religion explain these results? It could be that people read backwards from their current religious importance when reporting about childhood; accordingly, it may actually be important whether twins *currently* converge on their religiosity scores for adult flourishing. Still, the interaction coefficient for twins' childhood religiosity remains unchanged when adult religiosity scores are included for both twins and as an additional interaction in RC 2. Family conflict, particularly with one's twin, could also possibly color perceptions of the past and undermine flourishing, so RC 3 includes an index to account for that possibility. The main result is again unchanged.

Finally, we consider whether similarity in twin reports seem to matter at different ends of the religiosity spectrum. One threat to our conclusion about recollection consistency as a sign of socialization coherence is the possibility that discrepancies reflect only individual-level measurement error—that is, some of those with highest/lowest scores mis-reported, and so the input of their twin "corrected" their flourishing score to be line with what their true childhood score would produce. A way to examine this is to focus separately on people who reported relatively low and relatively high religiosity. For example, given that higher religiosity is generally associated with more flourishing, someone scoring low in childhood religiosity could exhibit higher levels of that outcome if their twin was *discrepant*, rather than consistent on the low religiosity report. This scenario, however, was not borne out in Table 3; instead, twin consistency was associated with more flourishing even among people who reported low retrospective religiosity ("not at all" or "not very" important - RC 4). In fact, the coefficient for twin consistency was even higher for those agreeing with their twin that religion was relatively unimportant compared to those agreeing that it was relatively important (0.85 and 0.62, respectively, both significant at $p < .01$).[7]

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[7] An additional set of supplementary analyses broke the composite flourishing scale into its three components–psychological flourishing, emotional flourishing, and social flourishing. Results showed that religious concordance was consistently associated with all three sub-scales, though the effect size for psychological flourishing was smaller than that of emotional and social flourishing.

Table 4

Multi-level linear regression robustness checks, Midlife Development in the United States study (MIDUS) twin sample ($N = 1631$).

	Model A	Robustness Check (RC) 1	RC 2	RC 3	RC 4	RC 5
	Preferred specification estimates for comparison	Overall twin concordance as probability weight	Adjusting for current religiosity	Adjusting for current family conflict	Twin 1 reports low religiosity[a]	Twin 1 reports high religiosity[b]
Retrospective religion						
Childhood family religiosity - twin 1 (tw1)	0.17 (0.09)	0.16 (0.09)	0.12 (0.09)	0.20 (0.09)*		
Childhood family religiosity - twin 2 (tw2)	−0.03 (0.08)	−0.03 (0.08)	−0.06 (0.09)	−0.06 (0.08)		
Twin similarity: Z1tw1 x Z1tw2	0.22 (0.07) **	0.22 (0.07) **	0.19 (0.08) *	0.20 (0.07) **		
Twin consistency: tw1 = tw2 (yes/no)					0.85 (0.29) **	0.56 (0.15) ***
Robustness check covariates						
Current religiosity - twin 1 (tw1)			0.15 (0.08)*			
Current religiosity - twin 2 (tw2)			0.06 (0.07)			
Twin similarity: Z2tw1 x Z2tw2			0.07 (0.07)			
Current family conflict				−0.89 (0.10) ***		
Constant	−4.58	−5.2	−5.11	−2.16	−4.8	−4.23
Log pseudolikelihood	−3568.73	−21428.09	−3502.31	−3472.9	−729.99	−2839.49
N	1631 (878 twin pairs)	1631 (878 twin pairs)	1609 (872 twin pairs)	1617 (876 twin pairs)	326 (231 twin pairs)	1305 (760 twin pairs)

Note: All models adjust for covariates shown in Table 3, Model A and are clustered by twin pair identification.

***p<.001; **p<.01; *p<.05.

[a] Person reports that religion was "not very" or "not at all" important.

[b] Person reports that religion was "very" or "somewhat" important.

6. Discussion

This paper adds to the growing number of studies suggesting that childhood religiosity has long-term implications for health and well-being (Upenieks et al. 2021a; Upenieks et al. 2021b; Upenieks and Schafer 2020). Distinct from earlier studies, however, our analyses incorporate family-level data beyond a single informant. Using twins, we showed that net of one's own perception of religion's importance in the home, *concordance* on early life religiosity is a key predictor of adult flourishing. Accounting for twins' general tendency to report on their childhood in similar ways, we interpret similarity in retrospective religion as a coherent early life exposure. Put differently, complex phenomena such as familial religiosity are inherently ambiguous; but adults appear better off to the extent that such ambiguity reduces to a common recollection. A coherent religious exposure may help young people develop key psychosocial resources (e.g., optimism, coping), enhance the ongoing relationship with their parents as they age, and reduce the chances of their own individual sense of religious ambiguity.

This interpretation generally matches the takeaway offered by Bartkowski et al., (2008), who concluded from studying elementary school students that "a cohesive religious environment in the home yields significant benefits for children's behavioral, emotional, and cognitive development" (pg. 34). Interestingly, however, our results showed that the long-term benefits of twin concordance existed not only for those who saw their childhood home as highly religious, *but also for those at the other end of the spectrum*. This suggests that the clarity of the early life exposure to a pair of recipients may be as, or more, important than its "average level" aggregated across multiple respondents.

That said, a significant blind spot of the current study is that sources of ambiguity attributed to twin discrepancies are not observable due to the single-item measure of recalled family religiosity. The wholistic portrayal of one's childhood family sidesteps some difficulties of making sweeping inferences about childhood religiosity by comparing, say, one parent versus another on any single discrete religious behavior; but, it does leave open a question about *what aspect(s)* of religious coherence are most central to children's development and lifelong flourishing.

To that end, future research with different survey data could build on our findings by examining (a) within-family change on various dimension of religiosity to trace *temporal ambiguity*; (b) differences between parents on various dimensions of religiosity to understand *parental ambiguity*; and (c) latent classes of (non)religiosity across varied indicators within family units to understand *expressive ambiguity*. For instance, researchers could quantify attendance dis/similarity between mothers and fathers in the PSID, rather than using only one parent in the survey to represent a household head (Pope et al. 2014). The National Longitudinal Study of Adolescent to Adult Health (Add Health), for its part, boasts a large and relatively diverse battery of questions (e.g., affiliation, attendance, peer religiosity) that could be used to identify complex patterns of mixed religious expression in early life. In short, use of

multiple data sources and analytic approaches appears necessary for pinpointing which aspect(s) of religious ambiguity matter for later-life well-being, as well as for further clarifying the difference between ambiguity and varieties of irreligiosity.[8] Consulting other data sources is also relevant given the fact that the MIDUS twin sample underrepresents racial minority, male, and younger-age adults (Lundborg 2013); ascertaining generalizeability, then, can complement the goal of conceptual enrichment.

Another caveat of the current study is the baseline MIDUS data are now somewhat dated. Given recent secularization trends (Voas and Chaves 2016), the high levels of recalled religiosity among adults in 1995 would not replicate among current cohorts of middle- and older-age people. Lower average levels of religiosity in the population, however, would not necessarily mean that family-level coherence ceases to be important. Indeed, whether religious ambiguity within families is becoming more or less consequential represents an intriguing question for future research. This is all the more relevant given the growth of "spiritual but not religious" as a self-designation (Wixwat and Saucier 2021); such a trend likely introduces even another (and harder to define) dimension of ambiguity in families.

As for strengths of our study, the MIDUS survey offers a wholistic measure of human flourishing, an approach which targets the promotion of health and well-being rather than simply documenting the presence or absence of disease or incapacity (Chen et al. 2019; VanderWeele et al. 2019). Second, the MIDUS twin sub-sample allowed us to hold constant the timing of exposure of the participants, ensuring that both participants experienced the family's religiosity at the same point of their own development and at an identical period of their parents' lives. Indeed, this twin sample is a unique, though surprisingly underutilized resource for analyses of religion and life course health; we would echo earlier calls to see it put to wider use (Bradshaw and Ellison 2008).

Looking beyond the current empirical case, our attention to the ambiguity of religiosity invites other investigations into how families embody complexity and send mixed signals in the socialization process. Growing up under certain political orientations or gender role ideologies may have short- and long-term consequences for achievement and well-being (e.g., Gollwitzer et al. 2022; McFadden et al., 2021), but these too are complicated and multifaceted sociocultural exposures. In addition to tracing the impact of one or both parents' attitudes or beliefs on such issues, researchers may press into the ways that families evolve, differ internally, or manifest seemingly inconsistent behaviors and priorities on a range of sociocultural dimensions.

Finally, religious ambiguity itself exists within social units larger than families. Religious organizations such as temples, synagogues, and churches, exhibit an internal diversity of beliefs and behaviors—but tolerance of ambiguity varies systematically, and may relate to how organizations grow, decline, and enforce their boundaries (Hoge et al. 1978; Iannaccone 1994; Thomas and Olson 2010). As in scientific institutions, ambiguity could also prove strategic as organizational actors align their actions in a social field, such as how religious organizations can hold ambiguous positions on controversial cultural topics to maintain credibility with certain constituencies while seeking to avoid alienating other actors (Wellman and James, 1999). Systematizing the forms of religious ambiguity that manifest across different social units of varying scales may provide valuable new insight into the role of religion in collective life.

Acknowledgement

Appendix

Table A1
Descriptive Statistics for Main Study Variables, Midlife Development in the United States Study (MIDUS) Twin Sample ($N = 1631$)

	Mean/prop.	S.D.	Range
Flourishing	0.00	2.37	−11.24–5.49
Childhood family religiosity - twin 1 (tw_1)	3.2	0.84	1–4
Childhood family religiosity - twin 2 (tw_2)	3.2	0.84	1–4
Parental abuse	1.27	0.59	1–4
Parental warmth	2.94	0.64	1–4
Age	45.1	12.13	25–75
Female	0.56		0,1
Non-white	0.06		0,1

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[8] Discordance in retrospective religiosity reports implies, at least, that childhood homes were not unambiguously devout. Ambiguity, however, raises the prospect that less intense expressions of religion have varied implications for life course outcomes, not merely as a function of degree along an ordered continuum, but perhaps with respect to the many complex, intersecting dimensions that make up religious belief, identity, and behavior.

Note: S.D. = standard deviation.

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