# Childhood religious experiences with peers and primary caregivers: Associations with individual differences in adult religiosity

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## ABSTRACT

Peers and primary caregivers influence the development of religious beliefs during childhood and adolescence. However, previous research has not assessed whether childhood religious experiences with peers and primary caregivers are differently related to individual differences in adult religiosity. We investigated whether the frequency of childhood religious experiences with peers and primary caregivers are related to adult religious beliefs and religious service attendance. An online sample of adults ($n = 525$) completed a survey that included a measure of religious beliefs and two recently developed measures that assess the ways in which peers and primary caregivers influenced religious experiences during childhood and adolescence. Results suggest that the frequency of childhood religious experiences with peers and primary caregivers are differently related to individual differences in adult religiosity: 1) Participation in religious activities with a peer, and primary caregiver's disapproval of religious deviation, are positively associated with adult religious *attendance*, 2) participation in religious activities with a peer, and primary caregiver's religious assurance, are positively associated with adult religious *belief*, and 3) primary caregiver's encouragement of religious skepticism is negatively associated with adult religious belief. Discussion highlights limitations of the current study and important directions for future research.

## 1. Introduction

Childhood and adolescence (ages 7-20 years; Tamminen, 1994) are important periods for the development of religious beliefs and practices (Benson, Roehlkepartain, & Rude, 2003; Hood, Hill, & Spilka, 2018; Hyde, 1990). In early childhood, individuals are often introduced to religion by their primary caregivers (usually parents), become affiliated with the religious community of their primary caregivers (Myers, 1996), and tend to remain affiliated with the same religious community when they are adults (Hunsberger & Brown, 1984; Sherkat, 2001; Smith & Sikkink, 2003; Uecker, Regnerus, & Vaaler, 2007). During adolescence, individuals become increasingly sensitive to peer influences (Berndt, 1979), including religious influence (Donelson, 1999). Having religious peers during adolescence is associated with participation in religious activities (e.g., church, youth group; Madsen & Vernon 1983; Smith, Denton, Faris, & Regnerus, 2002) and religious service attendance as an adult (O'Hara, 1980; Thomas & Cornwall, 1990). Furthermore, religious conversion is more

likely to occur during adolescence than at any other time over the lifespan (Gillespie, 1991; Kose, 1996; Smith, Denton, Faris, & Regnerus, 2002). Taken together, religious socialization during childhood and adolescence appears to set the stage for religious belief and affiliation in adulthood. However, previous research has not investigated the specific ways in which childhood religious experiences with peers and primary caregivers influence adult religiosity. Thus, the goal of the current study was to investigate whether and how the frequency of religious experiences with peers and primary caregivers throughout childhood and adolescence are associated with adult religiosity.

## 2. The nature (and nurture) of religious development

### 2.1. Why do primary caregivers matter?

Primary caregivers are an important source of shared environmental influence for religious socialization (Hayes & Pittelkow, 1993; Kelley & De Graaf, 1997; Kelley, 2015; Myers, 1996). Shared environmental

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influence refers to environmental similarities (e.g., living in the same household) that create psychological similarities between family members (i.e., siblings, parents). Primary caregivers transmit their own religious beliefs *directly* to their children by communicating these beliefs (e.g., belief in God; Braswell, Rosengren, & Berenbaum, 2012; Hoge, Petrillo, & Smith, 1982), modeling religious behavior (e.g., prayer, traditions; Flor & Knapp, 2001), and engaging in religious dialogue (Boyatzis & Janicki, 2003). Primary caregivers also influence their children's religious beliefs *indirectly* by immersing them in social groups outside the home that facilitate religious socialization (Cornwall, 1988;1989; Erickson, 1992; Himmelfarb, 1979; Martin, White, & Perlman, 2003). That is, primary caregivers can direct their children towards religious non-shared environmental influences – unique environmental influences experienced between family members (Turkheimer & Waldron, 2000) – thereby facilitating the development of religious beliefs and practices. Primary caregivers therefore initiate and steer religious development by exposing their children to religious beliefs and practices, which are reinforced by non-shared environmental influences, such as religious education and interactions with peers.

### 2.2. Why do peers matter?

Peers are agents within one's social environment who model and transmit cultural information, social norms, and values (Bandura, 1971, 2003), and are therefore an important source of non-shared environmental influence (Harris, 1995). Peers may play an important role in religious socialization because they inhabit the same social environments and usually share socially-relevant characteristics, such as age, gender, ethnicity, socioeconomic status, interests, and social group affiliations (Hallinan & Williams, 1990; Madsen & Vernon, 1983). For example, peers model religious beliefs and practices, and engage in religious dialogue with one another (Kelley, Athan, & Miller, 2007; Schwartz, Bukowski, & Aoki, 2006; Schwartz, 2006). Peers also encourage participation in religious activities, such as religious services and youth groups (Regnerus, Smith, & Smith, 2004), and the frequency of church attendance during childhood and adolescence is strongly associated with peers' church attendance (Martin, White, & Perlman, 2003; Ozorak, 1989; Regnerus, Smith, & Smith, 2004; Smith, Denton, Faris, & Regnerus, 2002) and peers' religiosity (Cornwall, 1988; French, Purwono, & Triwahyuni, 2011). Peers' influence on religious participation increases from early to late adolescence (Madsen & Vernon 1983; O'Hara, 1980), perhaps due to individuals becoming increasingly sensitive to conformity pressure during this period of life (Berndt, 1979; Erickson, 1992; O'Hara, 1980). Further, having religious peers in childhood predicts religious service attendance as an adult (Thomas & Cornwall, 1990). In sum, interactions with peers during childhood and adolescence may influence individuals' religious beliefs and affect how frequently individuals participate in religious activities in adulthood.

### 2.3. Current study

Previous investigations of religious influence during childhood and adolescence have been limited empirically because they often did not assess the specific ways that peers and primary caregivers influence religious beliefs and practices (Tratner et al., 2017a, 2017b). In the current study, we examine specific, quantifiable, childhood religious experiences with peers and primary caregivers using two recently developed quantitative measures of childhood religious experiences. The Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC; Tratner et al., 2017a) measures four facets of religious influence from a primary caregiver: *Assurance*, which refers to positively valanced attempts to console and persuade an individual to adopt religious beliefs; *Disapproval and Punishment*, which captures a primary caregiver's direct derogation or disapproval of an individual's divergent beliefs;

*Social Involvement*, referring to attempts to facilitate individuals' participation in religious activities; and *Encouraged Skepticism*, which represents a primary caregiver's encouragement to freely choose beliefs and explore other religions. The Childhood Religious Experiences with a Peer Inventory (CREPI; Tratner et al., 2017b) measures three facets of peer religious influence: *Peer Proselytization*, which includes a peer's attempts to impose their beliefs; *Shared Activities*, which refers to participation in religious activities with a peer; and *Peer Dialogue*, representing discussions of religious beliefs and ideas with a peer.

Both of these measures were developed inductively using an act nomination procedure (Buss & Craik, 1983), which compiled individuals' reported religious experiences with a primary caregiver and a peer, followed by a series of principal component analyses (for the CREI-PC) and exploratory factor analyses (for the CREPI) to establish each scale's structure. As a result, the individual scale items and the facets of religious influence that comprise each measure differ, owing to the bottom-up approach to scale development. Although both measures assess the construct of religious influence, they assess different aspects of religious influence, which may facilitate different religious outcomes.

The goal of the current research was twofold: 1) further evaluate the psychometric properties of the CREPI and CREI-PC, and 2) investigate whether facets of childhood religious experiences with peers and primary caregivers are differently related to adult religious belief and service attendance. First, we hypothesized that confirmatory factor analyses will replicate the three-factor structure of the CREPI (H1a) and the four-component structure of the CREI-PC (H1b). Second, we hypothesized that all three subscales of the CREPI will be *positively* related to adult religious belief (H2a) and religious service attendance (H2b), that the three subscales of the CREI-PC (Assurance, Disapproval and Punishment, Social Involvement) will be *positively* related to adult religious belief (H3a) and service attendance (H3b), and that the Encouraged Skepticism subscale of the CREI-PC will be negatively related to adult religious belief (H4a) and religious attendance (H4b). We had no *a priori* predictions about the relative predictive power of each measure's subscales, given mixed findings from previous research on religious socialization (De Vaus, 1983; Desrosiers, Kelly, & Miller, 2011; Myers, 1996).

## 3. Methods

### 3.1. Participants and procedure

Participants were 525 adults (50.1% male), aged 18 years or older ($M = 32.4$; $SD = 7.2$, $Range = 18$-$51$), whose self-reported religious affiliations were as follows: 50.5% Christian, 17.1% Atheist, 16.8% Agnostic, 8.0% Hindu, 1.5% Jewish, 1.1% Buddhist, 0.6% Muslim, and 4.4% specified an unlisted religious denomination. Participants viewed an advertisement for the study on Amazon.com's MTurk job listings and were provided access to the survey if they met the MTurk filter requirements. MTurk filters were implemented according to specifications recommended by Peer, Vosgerau, and Acquisti (2013): MTurk workers (i.e., participants) must have successfully completed at least 95% of at least 500 accessed MTurk jobs. Participants completed an online survey comprised of demographic questions, a religious belief scale adapted from the World Values Values Survey (Inglehart et al., 2014), a scale assessing the frequency of childhood religious experiences with a peer (CREPI; Tratner et al., 2017a), and a scale assessing the frequency of childhood religious experiences with a primary caregiver (CREI-PC; Tratner et al., 2017b). Participants were compensated $2.00 USD upon completion of the survey.

## 4. Materials

### 4.1. Religious belief scale

Participants reported their current religious affiliation, indicated

how frequently they attend religious services (0 = *Never*, 9 = *Every day*), and stated the extent to which they agreed with a series of six religious belief statements, using a 10-point Likert scale (0 = *Strongly Disagree*, 9 = *Strongly Agree*). These items have been used previously in cross-cultural research on social/religious attitudes (Inglehart et al., 2014; Weeden & Kurzban, 2013). Examples of religious belief items include "God exists" and "There is a heaven" (for a full list of religious belief items, see Appendix A). Frequency of religious service attendance, and the aggregate score of the six religious belief statements were used as outcome variables in the analyses that follow.

### 4.2. Childhood Religious Experiences with a Peer Inventory (CREPI)

Participants identified a person from their childhood whom they considered their best (or closest) friend while they were growing up. Participants were instructed to select a friend that was 1) the same sex as them, 2) raised in a different household than them, and 3) less than 10 years older or younger than them. These criteria ensured that selected friends were social role-models (Bandura, 1971, 2003). The friendships began, on average, when the participants were 10 years old (*SD* = 3.2), and the majority (60.2%) of selected friends were the same age as the participant. Using a 7-point Likert scale (0 = *Never*, 6 = *Always*), participants indicated the frequency with which they experienced each of the 27 items. Examples of items include "My friend told me I should believe in God" and "My friend and I attended a youth group together" (see Appendix B for a full list of CREPI items; Tratner et al., 2017b).

### 4.3. Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC)

Participants selected a primary caregiver from their childhood who provided them with the majority of daily care while they were growing up. Participants also provided information about their relationship with the chosen primary caregiver (e.g., biological mother, step-father, paternal grandfather) as well as their primary caregiver's religious affiliation. A majority (87.6%) of participants selected their biological mother as their primary caregiver. Participants indicated the frequency with which they experienced each of the 16 items, on a 7-point Likert scale (0 = *Never*, 6 = *Always*). Examples of items include "My primary caregiver told me that my actions made God upset" and "My primary caregiver signed me up for a religious activity" (see Appendix C for a full list of CREI-PC items; Tratner et al., 2017a).

## 5. Results

### 5.1. Analytical procedure

Previous research employed exploratory factor analyses (CREPI) and principal component analyses (CREI-PC) to establish each measure's three-factor and four-component structures, respectively (Tratner et al., 2017b, 2017a). To confirm the established scale structure for each measure, we performed confirmatory factor analyses for the CREPI and CREI-PC using a maximum likelihood estimation technique. For the confirmatory factor analyses (CFA), we calculated Akaike Information Criteria (AIC) and four global fit indices, with suggested threshold for good model fit shown in parentheses (Hooper, Coughlan, & Mullen, 2008): (1) Chi-square to degrees of freedom ratio ($\chi^2/df$, $p >$ 0.05), (2) Root-Mean-Square Error of Approximation (RMSEA < 0.08), (3) Comparative Fit Index (CFI ≥ 0.90), and (4) Standardized Root Mean Residual (SRMR < 0.10). Next, we tested the hypotheses by performing linear regression analyses and investigating the relationship between childhood religious experiences (with a peer and with a primary caregiver) and self-reported adult religious belief and religious attendance.

### 5.2. CREPI confirmatory factor analyses

To investigate whether the current data replicated the previously established 27-item, three-factor structure of the CREPI (Tratner et al., 2017b), we performed a CFA. We specified a model consisting of three correlated factors replicating the three factors obtained by Tratner et al. (2017b). The three-factor CFA indicated mediocre model fit; AIC = 43067.177, $\chi^2$ ($n$ = 525, 321) = 1936.027, $p$ = 0.000; RMSEA = 0.098 (90% CI = 0.094 - 0.102); CFI = 0.905; SRMR = 0.043.[1] Prior to performing a second CFA, we removed five items that may have reduced model fit. Specifically, modification indices indicated potential issues with items 4, 15, 22, 24, and 27. Examination of these items indicated ambiguity in their wording or redundancy with other items, therefore these items were removed for the second CFA (see Appendix B for further discussion). Next, we performed a second CFA with the remaining 22 items loading onto 3 correlated factors. The second three-factor CFA indicated improved model fit; AIC = 34696.265, $\chi^2$ ($n$ = 525, 206) = 1024.793, $p$ = 0.000; RMSEA = 0.087 (90% CI = 0.082 - 0.092); CFI = 0.94; SRMR = 0.029). In sum, $\chi^2$ and AIC values decreased, and other indices indicated acceptable fit (i.e., RMSEA) or very good fit (i.e., CFI, SRMR). Although $\chi^2$ was below the suggested threshold for good model fit, this fit index may be unreliable when interpreting model fit as it is affected by sample size and non-normal scale scores, such that low sample size, skewness, and kurtosis may cause $\chi^2$ misfit (Hooper et al., 2008). In contrast, RMSEA is a more appropriate global fit index when interpreting models using samples with smaller $n$, because RMSEA provides a confidence interval (MacCallum, Browne, & Sugawara, 1996) and, therefore, allows for better interpretation of model fit (Hooper et al., 2008). Further, the second CFA demonstrated improvements for other global fit indices (CFI, SRMR). Thus, this CFA confirmed that the 22-item, three-factor CREPI model (see Figure 1) provided a better fit to the data and, therefore, provided support for H1a. This reduced scale was used in further analyses. Descriptive statistics for items and factors are listed on Table 1, and for a complete list of the finalized CREPI items, see Appendix D.

### 5.3. CREI-PC confirmatory factor analyses

To investigate whether the current data replicated the previously obtained four-component structure of the CREI-PC (Tratner et al., 2017a), we performed a CFA consisting of four correlated factors. We calculated AIC as well as four global fit indices: $\chi^2$, RMSEA, CFI, and SRMR. Fit indices for this first CFA indicated mediocre fit; AIC = 29636.461, $\chi^2$ ($n$ = 525, 98) = 520.737, $p$ = 0.000; RMSEA = 0.091 (90% CI = 0.083 - 0.098); CFI = 0.938; SRMR = 0.071, with some fit indices indicating good fit (i.e., CFI, SRMR) and others inadequate fit (i.e., $\chi^2$, RMSEA).

Before proceeding with the second CFA, we removed three items contributing to reduced model fit. Modification indices indicated potential issues with items 8, 11, and 14; further examination revealed redundancies between items and poor item content, therefore these items were removed (see Appendix C for further discussion). Next, we performed a second CFA with the remaining 13 items loading onto 4 correlated factors. The second CFA indicated improved model fit, with smaller AIC and $\chi^2$ values and improved fit indices; AIC = 23999.542, $\chi^2$ ($n$ = 525, 59) = 233.835, $p$ = 0.000; RMSEA = 0.075 (90% CI = 0.065 - 0.085); CFI = 0.968; SRMR = 0.052). With the exception of $\chi^2$, all indices indicated very good fit. Thus, this CFA confirmed that

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[1] Because there are high intercorrelations between the three CREPI subscales, we performed an additional CFA specifying a single-factor model instead of a three-factor model. Results for the single-factor model indicated very poor model fit. Thus, we proceeded with a three-factor model in line with Tratner et al. (2017b).
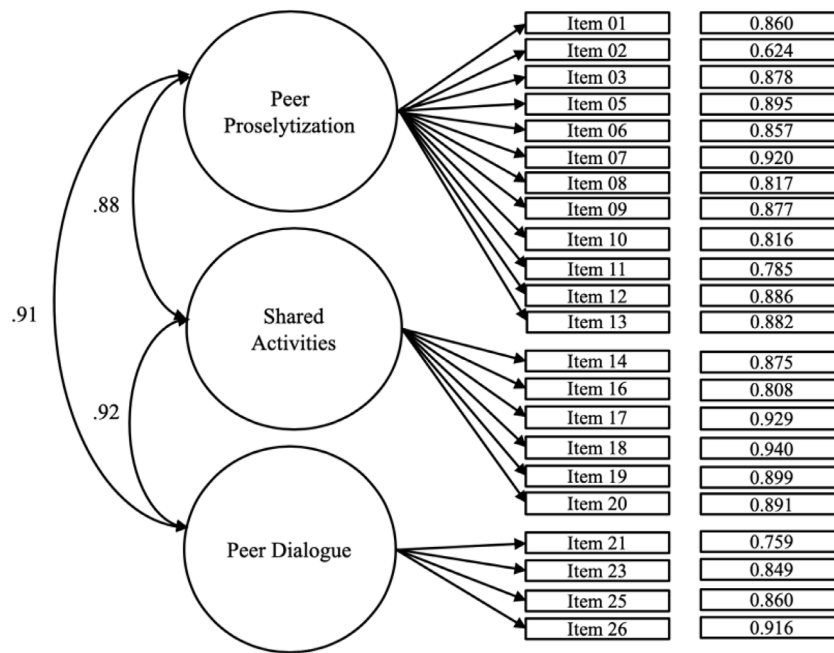
**Fig. 1.** Final CREPI CFA.
Left: Correlations between latent factors; Right: Factor loadings for scale items. Error terms omitted for presentation. All *ps* < 0.001.

**Table 1**
Descriptive statistics of the items and factors of CREPI (*n* = 525).

| Factor | *M* | *SD* | Skewness | Kurtosis | Factor Loading | Cronbach's α |
|---|---|---|---|---|---|---|
| **Peer Proselytization** | 1.71 | 1.62 | 0.66 | -0.80 | | 0.97 |
| Item 01 | 1.79 | 1.87 | 0.52 | -1.00 | 0.86 | |
| Item 02 | 1.01 | 1.65 | 1.42 | 0.74 | 0.62 | |
| Item 03 | 1.60 | 1.82 | 0.68 | -0.75 | 0.88 | |
| Item 05 | 1.81 | 2.02 | 0.60 | -1.04 | 0.90 | |
| Item 06 | 1.70 | 1.91 | 0.69 | -0.85 | 0.86 | |
| Item 07 | 1.62 | 1.94 | 0.78 | -0.70 | 0.92 | |
| Item 08 | 2.37 | 1.79 | 0.11 | -0.87 | 0.82 | |
| Item 09 | 1.61 | 1.95 | 0.78 | -0.78 | 0.88 | |
| Item 10 | 1.84 | 1.91 | 0.54 | -0.97 | 0.82 | |
| Item 11 | 2.10 | 1.98 | 0.32 | -1.19 | 0.79 | |
| Item 12 | 1.60 | 1.90 | 0.80 | -0.68 | 0.89 | |
| Item 13 | 1.50 | 1.87 | 0.89 | -0.51 | 0.88 | |
| **Shared Activities** | 1.45 | 1.74 | 0.95 | -0.41 | | 0.96 |
| Item 14 | 1.75 | 2.02 | 0.67 | -0.99 | 0.88 | |
| Item 16 | 1.52 | 1.94 | 0.84 | -0.74 | 0.81 | |
| Item 17 | 1.28 | 1.84 | 1.16 | 0.00 | 0.93 | |
| Item 18 | 1.32 | 1.83 | 1.11 | -0.39 | 0.94 | |
| Item 19 | 1.42 | 1.92 | 0.99 | -0.35 | 0.90 | |
| Item 20 | 1.43 | 1.94 | 0.95 | -0.55 | 0.89 | |
| **Peer Dialogue** | 1.66 | 1.64 | 0.77 | -0.48 | | 0.91 |
| Item 21 | 1.81 | 1.83 | 0.54 | -0.88 | 0.76 | |
| Item 23 | 1.86 | 1.82 | 0.47 | -0.93 | 0.85 | |
| Item 25 | 1.54 | 1.81 | 0.83 | -0.47 | 0.86 | |
| Item 26 | 1.45 | 1.89 | 0.96 | -0.44 | 0.92 | |

the 13-item, four-factor CREI-PC model (see Figure 2) provided a good fit to the data, replicated the four-factor structure established by Tratner et al. (2017a), and supported H1b. This reduced scale was used in further analyses. Descriptive statistics for items and factors are listed on Table 2, and for a complete list of the finalized CREI-PC items, see Appendix E.

### 5.4. Correlations

A correlation table was constructed to allow inspection of the relationships between all CRE and religiosity variables. Descriptive statistics and zero-order correlations for religious belief, religious

attendance, and all CREPI and CREI-PC subscales are presented in Table 3. Results indicated significant correlations between religious belief and religious attendance (*r* = .63, *p* < .01), religious belief and all CREPI and CREI-PC subscales, and religious attendance with all CREPI and CREI-PC subscales except *Encouraged Skepticism*. These findings suggest that childhood religious experiences with peers and primary caregivers are associated with adult religiosity, and therefore provide additional evidence for each measure's criterion validity.

### 5.5. Hierarchical multiple regression analyses

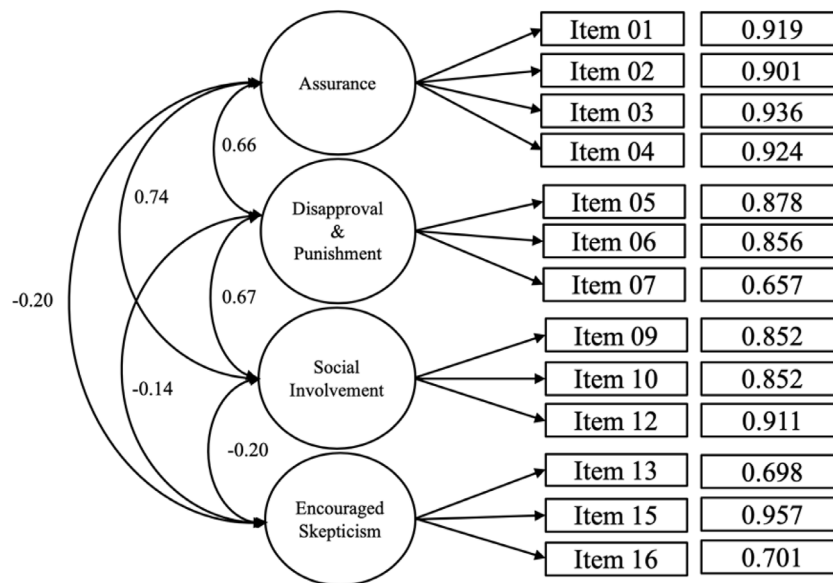Next, we performed four hierarchical multiple regression analyses

**Fig. 2.** Final CREI-PC CFA.
Left: Correlations between latent factors; Right: Factor loadings for scale items. Error terms omitted for presentation. All *ps* < 0.00.

**Table 2**
Descriptive statistics of the items and factors of CREI-PC (*n* = 525).

| Factor | *M* | *SD* | Skewness | Kurtosis | Factor Loading | Cronbach's α |
|---|---|---|---|---|---|---|
| **Assurance** | 2.89 | 1.93 | -0.12 | -1.16 | | 0.96 |
| Item 01 | 2.92 | 1.99 | -0.11 | -1.07 | 0.92 | |
| Item 02 | 2.92 | 2.10 | -0.84 | -1.21 | 0.90 | |
| Item 03 | 2.59 | 1.98 | 0.87 | -1.13 | 0.94 | |
| Item 04 | 3.11 | 2.15 | -0.19 | -1.24 | 0.92 | |
| **Disapproval & Punishment** | 1.67 | 1.64 | 0.82 | -0.25 | | 0.83 |
| Item 05 | 1.72 | 1.86 | 0.72 | -0.59 | 0.88 | |
| Item 06 | 1.63 | 1.94 | 0.82 | -0.62 | 0.86 | |
| Item 07 | 1.67 | 1.90 | 0.74 | -0.66 | 0.66 | |
| **Social Involvement** | 2.36 | 1.90 | 0.28 | -1.14 | | 0.90 |
| Item 09 | 2.74 | 1.98 | -0.02 | -1.11 | 0.85 | |
| Item 10 | 1.99 | 2.12 | 0.53 | -1.16 | 0.85 | |
| Item 12 | 2.35 | 2.12 | 0.27 | -1.29 | 0.91 | |
| **Encouraged Skepticism** | 2.69 | 1.90 | 0.14 | -1.14 | | 0.83 |
| Item 13 | 2.99 | 2.09 | -0.05 | -1.19 | 0.70 | |
| Item 15 | 2.98 | 2.25 | -0.61 | -1.38 | 0.96 | |
| Item 16 | 2.11 | 2.28 | 0.52 | -1.24 | 0.70 | |

to investigate the relationships between childhood religious experiences (with a peer and with a primary caregiver) and adult religiosity, and to examine the unique contribution of the peer vs. primary caregiver subscales. To test the study's main hypotheses, adult religious belief was selected as the outcome variable for the first two regression analyses, followed by religious service attendance as the outcome variable for the third and fourth regression analyses. All CREPI and CREI-PC subscales were entered as predictors, step-wise.

For the first hierarchical multiple regression analysis, we selected religious belief as the outcome variable, and added all of the CREPI subscales as predictors in the first step, followed by all of the CREI-PC subscales as predictors in the second step. The first step explained a significant portion of the variance [$F_{(3, 521)} = 25.55$, $MSE = 9.79$, $R^2 = 0.13$, $p < .001$], and indicated significant effects for *Shared Activities* with a peer on religious belief ($b = .69$, SE $= .16$, $\beta = .36$, $t = 4.32$, $p < .001$). The second step explained additional variance [$F\Delta_{(4, 517)} = 11.03$ $MSE = 9.09$, $R^2\Delta = .07$, $R^2 = 0.20$, $p < .001$] and indicated significant effects of primary caregiver *Assurance* ($b = 0.49$, SE $= .10$, $\beta = .29$, $t = 4.84$, $p < .001$), and primary caregiver's *Encouraged Skepticism* ($b = -.17$, SE $= .07$, $\beta = -.09$, $t = -2.26$, $p = .024$) on religious belief.

The second hierarchical multiple regression repeated the same steps but in reverse: CREI-PC subscales were entered as predictors in the first

**Table 3**
Zero-order correlations and descriptive statistics for self-reported religious belief, religious service attendance, childhood religious experiences with a peer[a], and childhood religious experiences with a primary caregiver[b].

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Religious Belief | __ | | | | | | | | |
| 2. | Religious Attendance | .63** | __ | | | | | | | |
| 3. | Peer Proselytization[a] | .30** | .47** | __ | | | | | | |
| 4. | Shared Activities[a] | .36** | .55** | .84** | __ | | | | | |
| 5. | Peer Dialogue[a] | .30** | .48** | .85** | .84** | __ | | | | |
| 6. | Assurance[b] | 38** | .40** | .46** | .46** | .46** | __ | | | |
| 7. | Disapproval & Punishment[b] | .25** | .42** | .48** | .47** | .48** | .61** | __ | | |
| 8. | Social Involvement[b] | .30** | .43** | .45** | .52** | .49** | .69** | .62** | __ | |
| 9. | Encouraged Skepticism[b] | -.10* | .01 | .18** | .11* | .16** | -.13** | -.05 | -.13** | __ |
| | Mean | 4.64 | 2.30 | 1.71 | 1.45 | 1.66 | 2.89 | 1.67 | 2.36 | 2.69 |
| | Standard Deviation | 3.34 | 2.69 | 1.62 | 1.74 | 1.64 | 1.94 | 1.64 | 1.90 | 1.90 |

*Note: p < .05*, p < .01***

[a] CREPI
[b] CREI-PC

step, followed by the CREPI subscales in the second step. The first step explained a significant portion of the variance [$F (4, 520) = 22.53$, $MSE = 9.59$, $R^2 = 0.15$, $p < .001$], and indicated significant effects of primary caregiver *Assurance* on religious belief ($b = 0.55$, $SE = .10$, $\beta = .32$, $t = 5.39$, $p < .001$). The second step explained additional variance [$F\Delta (3, 517) = 10.54$ $MSE = 9.09$, $R^2\Delta = .05$, $R^2 = 0.20$, $p < .001$] and indicated significant effects for *Shared Activities* with a peer on religious belief ($b = .59$, $SE = .16$, $\beta = .31$, $t = 3.69$, $p < .001$).

Thus, results of the first two hierarchical regression analyses indicated that more frequent participation in religious activities with a peer and primary caregiver's religious assurance was positively related to adult religious belief, whereas more frequent encouraged skepticism of religion from a primary caregiver was negatively related to adult religious belief. These findings provided partial support for *H2a* and *H3a*, and full support for *H4a*. In addition, these findings provide further evidence for the CRE scales' construct as well as criterion validity, as different facets of childhood religious experiences with peers and primary caregivers are differently related to individual differences in adult religious belief. Furthermore, these analyses revealed that the CREI-PC items, that is, childhood religious experiences with a primary caregiver, accounted for slightly more variance (~2%) in adult religious belief than did the CREPI items, or childhood religious experiences with a peer.

In the third hierarchical multiple regression analysis, we selected religious attendance as the outcome variable, and added all of the CREPI subscales as predictors in the first step, followed by all of the CREI-PC subscales as predictors in the second step. The first step explained a significant portion of the variance [$F (3, 521) = 77.38$, $MSE = 5.03$, $R^2 = 0.31$, $p < .001$], and indicated significant effects for *Shared Activities* with a peer on religious attendance ($b = .80$, $SE = .12$, $\beta = .52$, $t = 6.95$, $p < .001$). The second step explained additional variance [$F\Delta (4, 517) = 8.58$ $MSE = 4.75$, $R^2\Delta = .04$, $R^2 = 0.35$, $p < .001$] and indicated significant effects of primary caregiver's *Disapproval and Punishment* ($b = .20$, $SE = .08$, $\beta = .12$, $t = 2.52$, $p = .012$) on religious attendance.

The fourth hierarchical multiple regression analysis repeated the same steps in reverse, with the CREI-PC subscales entered in the first step, followed by the CREPI subscales in the second step. The first step explained a significant portion of the variance [$F (4, 520) = 39.71$, $MSE = 5.58$, $R^2 = 0.23$, $p < .001$], and indicated significant effects of primary caregiver's *Disapproval and Punishment* ($b = 0.33$, SE = .08, $\beta = .20$, $t = 3.84$, $p < .001$) and *Social Involvement* ($b = .33$, SE = .81, $\beta = .23$, $t = 4.06$, $p < .001$) on religious attendance. The second step explained additional variance [$F\Delta (3, 517) = 31.18$ $MSE = 4.75$, $R^2\Delta = .12$, $R^2 = 0.35$, $p < .001$] and indicated significant effects for *Shared Activities* with a peer on religious attendance ($b = .70$, $SE = .12$, $\beta = .46$, $t = 6.13$, $p < .001$).

Results of the third and fourth hierarchical regression analyses indicated that more frequent primary caregiver disapproval and punishment of divergent beliefs and participation in religious activities with a peer was positively related to adult religious service attendance. These findings provided partial support for *H2b* and *H3b*, but failed to provide support for *H4b*.

Results also revealed that the CREPI items, that is, childhood religious experiences with a peer, accounted for more variance (~8%) in adult religious attendance than did the CREI-PC items, or childhood religious experiences with a primary caregiver. These findings provide further evidence for CREPI and CREI-PC scales' validity.

*5.6. Exploratory MANOVAs*

Exploratory MANOVAs were conducted to compare differences in childhood religious experiences between religious groups. Although our sample did not include a sufficient number of individuals from certain religious denominations (e.g., Jews, Muslims, Hindus) to compare differences in the frequency of childhood religious experiences across

religions, we compared religiously affiliated (i.e., Christians, Jews, Muslims) and non-affiliated individuals (i.e., Atheists and Agnostics). First, we performed a MANOVA to investigate differences between religiously affiliated and non-affiliated individuals in the frequency of childhood religious experiences with a primary caregiver. Results indicated that religiously affiliated and non-affiliated individuals reported different frequencies of childhood religious experiences with a primary caregiver [*Wilks' Lambda* $= 0.92$, $F (4, 523) = 11.55$, $p < .001$, $\eta p^2 = .082$]. Tests of between-subjects effects indicated the following: religiously affiliated (vs. non-affiliated) individuals reported more frequent primary caregiver *Assurance* [$F (1, 523) = 41.24$, $p < .001$, $\eta p^2 = .073$], *Disapproval and Punishment* [$F (1, 523) = 25.90$, $p < .001$, $\eta p^2 = .047$], and *Social Involvement* [$F (1, 523) = 31.31$, $p < .001$, $\eta p^2 = .056$], and reported less frequent *Encouraged Skepticism* [$F (1, 523) = 3.07$, $p = 0.08$, $\eta p^2 = .006$; marginally significant; Gelman, 2013], replicating previous findings (Tratner et al., 2017a).

A second MANOVA was performed to investigate differences between religiously affiliated and non-affiliated individuals in the frequency of childhood religious experiences with a peer. Results indicated that religiously affiliated and non-affiliated individuals reported different frequencies of childhood religious experiences with a peer [*Wilks' Lambda* $= 0.90$, $F (4, 523) = 18.48$, $p < .001$, $\eta p^2 = .096$]. Tests of between-subjects effects showed that religiously affiliated (vs. non-affiliated) individuals reported more frequent *Peer Proselytization* [$F (1, 523) = 37.94$, $p < .001$, $\eta p^2 = .068$], *Shared Activities* [$F (1, 523) = 54.94$, $p < .001$, $\eta p^2 = .095$], and *Peer Dialogue* [$F (1, 523) = 33.20$, $p < .001$, $\eta p^2 = .060$].

In sum, individuals who nominally reported a religious affiliation as an adult reported more frequent childhood religious experiences with a primary caregiver and with a peer, with the exception of primary caregiver's encouraged skepticism.

## 6. Discussion

Childhood and adolescence are important developmental periods for the acquisition of religious beliefs and practices, and previous research has documented that the influence of peers and primary caregivers is related to individual differences in adult religiosity (Erickson, 1992; Desrosiers, Kelly, & Miller, 2011; Regnerus, Smith, & Smith, 2004). However, the constructs of peer and primary caregiver religious influence have not been adequately operationalized, and the specific ways that they exert their influence have not been established in previous studies. To address this, the current research evaluated the psychometric properties of two recently developed measures, the Childhood Religious Experiences with a Peer Inventory (CREPI) and the Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC). Confirmatory factor analyses replicated the previously obtained four and three factor structures, respectively (Tratner et al., 2017a, 2017b), and further analyses using these scales revealed that the frequency of religious experiences with peers and with primary caregivers is related to individual differences in adult religious belief and attendance. Specifically, results indicated that different facets of childhood religious experiences with a peer and primary caregiver are differently associated with adult religious belief and attendance.

For instance, the frequency of participation in religious activities with a peer (e.g., a religious youth group) is positively related to adult religious belief. However, the frequency with which primary caregivers attempted to involve their children in religious activities (e.g., encouraging attendance at a religious camp, encouraging participation in a religious youth group) is unrelated to adult religious belief, suggesting that development of religious beliefs may rely more on interactions with peers during religious activities than on a primary caregiver's insistence on participation in religious activities. Close peers may contribute to the development of religious beliefs via mutual participation in religious activities and involvement in religious groups, perhaps reinforcing shared beliefs and encouraging their long-term maintenance.

However, the frequency of a peer's attempts to proselytize and the frequency of engaging in discussions about religious beliefs with a peer are unrelated to adult religious belief in this sample (cf. Kelley, Athan, & Miller, 2007; Schwartz, 2006). This suggests that shared religious *behavior*, rather than *discourse*, with a peer is related to adult religious belief.

Qualitative research on religious socialization indicates that primary caregivers attempt to facilitate the development of religious beliefs by communicating religious beliefs to their children (Boyatzis & Janicki, 2003; Dollahite, & Thatcher, 2008; Flor & Knapp, 2001). However, the precise methods primary caregivers use to present their religious beliefs to their children may render their influence more or less efficacious. Our results indicated that individuals whose primary caregivers more frequently present a consolatory view of religious belief (e.g., "God has a plan for everything"; "Believing in God will help you through difficult times") were more religious as adults. Conversely, individuals whose primary caregivers more frequently allowed them to freely choose their own religious beliefs and opt out of attending religious services had, on average, less religious beliefs as adults. Interestingly, the frequency with which primary caregivers disparaged their children's beliefs (*Disapproval and Punishment*, e.g., questioning an individuals' beliefs when they differed from their own; Telling individuals their actions made God upset and they will suffer in the afterlife) is unrelated to adult religious belief, perhaps indicating that this fire-and-brimstone approach to religious communication is less effective in instilling long-term religious beliefs than other forms of communication.

Further analyses indicated that the frequency of participation in religious activities with a peer is positively related to adult religious service attendance. Peers may therefore influence both belief and attendance synergistically through involvement in religious activities during childhood and adolescence. Results also showed that the frequency of a primary caregiver's religious disapproval and punishment is modestly and positively related to adult religious service attendance, but not adult religious belief. Identifying the precise ways in which this type of religious communication increases adult religious service attendance is beyond the scope of the current study. We note, however, that frequent exposure to this type of religious communication may instill a felt obligation to attend religious services as adults. Future research is needed to identify the pathways by which these childhood religious experiences lead to adult religious service attendance.

Taken together, this research supports the notion that religious beliefs and commitments are shaped differently by peers and primary caregivers. On one hand, close peers, a source of non-shared environmental influence, may encourage the development of religious beliefs and religious service attendance via mutual participation in religious activities. On the other hand, primary caregivers, a source of shared environmental influence, may encourage the development of religious beliefs and religious service attendance by communicating their own religious values via *Religious Assurance, Encouraged Skepticism,* and *Disapproval and Punishment*. Thus, the CREPI and CREI-PC can be used to investigate whether and to what extent shared and non-shared environmental influences are associated with adult religious outcomes.

### 6.1. Disentangling the nature and nurture of religious development

Scholarly work on religious development has typically emphasized the role of familial, peer, and community influences on the transmission of religious beliefs and practices, and on religious affiliation (Allport, 1950; Bandura, 1971; Bengtson, Copen, Putney, & Silverstein, 2009; Boyatzis, Dollahite, & Marks, 2006; Cornwall, 1988; Erickson, 1992; Hoge, Petrillo, & Smith, 1982; Regnerus, Smith, & Smith, 2004; Schwartz, Bukowski, & Aoki, 2006). This emphasis on social influences may stem from an assumption that religion is primarily a culturally transmitted phenomenon (Cavalli-Sforza, Feldman, Chen, & Dornbusch, 1982), and that religiosity (i.e., belief), like many other psychological attributes (e.g., personality, political orientation),

is determined primarily by family upbringing and community socialization (Alford, Funk, & Hibbing, 2005; Harris, 2011; Wozniak, 1984). The common observation that people's religious beliefs and affiliation resemble those of their family, friends, and community at-large may also buttress this assumption. For example, people raised in Catholic households in predominately Catholic communities usually become Catholic adults. Thus, previous work on religious development has often focused on assessing familial influences (i.e., parents; shared environmental influence) rather than biological factors (i.e., shared heritable characteristics). Although religious affiliation (i.e., religious denomination) is largely determined by country of origin, geographic location, and family background (Boomsma, de Geus, van Baal, & Koopmans, 1999; Gunnoe & Moore, 2002; Kelley, 2015; Van Tubergen, 2006), adult religious *beliefs* and *attitudes* are more strongly influenced by biological factors, such as heritable traits (D'Onofrio, Eaves, Murrelle, Maes & Spilka, 1999) and non-shared environmental influences, such as interactions with peers during childhood and adolescence (Desrosiers, Kelley, & Miller, 2011; Schwartz, 2006).

Research in behavioral genetics has documented that adult social attitudes and beliefs are more strongly influenced by heritable traits than by vertical cultural transmission from parents (Martin et al., 1986; D'Onofrio et al., 1999). Studies comparing adult monozygotic twins have indicated that genetic influences account for the largest portion of the variance (~50% or more) in self-reported religiosity across different measures of religious belief (e.g., Bradshaw & Ellison, 2008; Bouchard & McGue, 2003; Waller et al., 1990). However, shared environmental influences account for more variance in religious belief than genetic influences during childhood (Eaves, Hatemi, Prom-Womley, & Murrelle, 2008) and adolescence (Koenig, McGue, Krueger, & Bouchard, 2005). For instance, research comparing adult monozygotic twins has documented that although shared environmental influences account for a larger portion of variance in retrospectively reported childhood religiosity, genetic influences account for a larger portion of the variance in adult religious beliefs (e.g., conservative religious beliefs, biblical literalism, born-again conversion) and non-shared environmental influences account for a larger portion of the variance in adult religious service attendance (Bradshaw & Ellison, 2008).

In sum, these reviewed studies corroborate the idea that religious belief and affiliation are shaped by a confluence of genetic and environmental factors, and that individuals may be differently influenced by these factors at different stages of development. Religious belief and affiliation may be initially more influenced by shared environmental factors, but gradually yield to non-shared environmental factors and genetic factors as individuals transition to adulthood (Bouchard, 2004). That is, as individuals progress from childhood to adulthood, the impact of shared environmental factors (i.e., parenting) on religiosity, as on other psychological characteristics (e.g., personality; Harris, 1995/2011), diminishes. Nonetheless, adult religious beliefs and commitments are likely shaped by a combination of shared and non-shared environmental influences during childhood and adolescence, such as interactions with primary caregivers (i.e., parents) and peers (i.e., friends, classmates, community members). Parents may set the stage for children's religiosity by exposing them to religious groups and belief systems; however, these beliefs may then be elaborated and strengthened by interactions with peers throughout development. Finally, as individuals transition into adulthood, the heritability of religiosity increases, and social networks maintain religious beliefs and practices. We contend that future investigations of, and theorizing about, religious development should consider the influence of heritable traits, shared environmental influences, and non-shared environmental influences in tandem, and assess how these different inputs predict adult religiosity.

## 6.2. Future directions and limitations

The CREPI and CREI-PC assess religious experiences during childhood and adolescence because these periods appear to be particularly important for establishing adult religiosity. Both measures capture different facets of religious influence and integrate them into single set of psychometrically-validated scales that may be used in future research to investigate the ways that peers and primary caregivers shape religious development. Moreover, these inventories assess the construct of peer religious influence, a source of non-shared environmental influence, and the construct of primary caregiver religious influence, a source of shared environmental influence. Thus, these psychometrically-validated measures afford profitable future investigation of the ways in which peers and primary caregivers influence childhood religious experiences. We recommend that future research employs our confirmed, reduced scales (for directions, scoring, and complete lists of items, see Appendices D and E).

Although the current study contributes to the literature on religious socialization, it has limitations. Several limitations pertain to the scale measures used in this study. For instance, the CREPI and CREI-PC are retrospective measures that require participants to reflect on attitudes and behaviors from several years if not decades prior, which may result in inaccurate recall of childhood religious experiences (Henry, Moffitt, Caspi, Langley, & Silva, 1994). Another possibility is that individuals may be susceptible to biased memories of childhood religious experiences. For instance, an adult religious person may be more likely to recall religious experiences from childhood than a non-religious person because those memories are more salient in light of their current beliefs. Further, these measures of childhood religious experiences assess the influence of only one same-sex peer and one primary caregiver. Different types of peers (e.g., peer groups, opposite-sex peers, familial peers; Schwartz, Bukowski, & Aoki, 2006) and primary caregivers (e.g., grandparents; Copen, & Silverstein, 2007) may influence religious beliefs differently. Primary caregiver influence may also depend on individuals' attachment style and relationship with their primary caregiver (Kim-Spoon, Longo, & McCullough, 2012; Kirkpatrick, 1998; Kirkpatrick & Shaver, 1990), which is not assessed by the CREI-PC.

However, future research could address this by investigating how relationship quality with and attachment to primary caregivers is related to the frequency of childhood religious experiences, and whether this affects adult religiosity. In addition, the CREPI cannot assess the aggregate influence of religious social networks, an important facet of religious socialization (Patacchini & Zenou, 2016). Lastly, because these two measures were originally developed using a primarily Christian sample, their items may reflect the childhood religious experiences of Christians, and therefore may be more suitable for Christian populations than other religious groups.

Other limitations pertain to the sample of adult MTurk workers and the scope of this research. Although the MTurk sample was relatively heterogeneous (e.g., similar numbers of men and women, variety of religious denominations), most participants were nominally affiliated with a religion (a majority were Christian), whereas atheists and agnostics only comprised one-third of the sample. This sample improved upon previous research that relied on college student convenience samples (Cutting & Walsh, 2008); however, the current research would have benefitted from recruiting larger, more representative samples of both religious and non-religious participants to further examine whether differences in childhood religious experiences are related to adult religious affiliation and beliefs. Another limitation of this study is that it did not secure data on participant ethnicity and geographic location. Individuals from different ethnic backgrounds and geographic locations report differences in religious affiliation (Gunnoe & Moore, 2002; Kelley, 2015; Van Tubergen, 2006), and future research should assess whether individuals from different racial/ethnic groups and geographic locations report different frequencies of childhood religious experiences with peers and primary caregivers. Recruiting a large, multi-generational sample would also allow for researchers to investigate differences in childhood religious experiences between different age cohorts, as individuals born since the 1990s report decreased religiosity and lower religious affiliation than do older cohorts (Schwadel, 2010; Schwadel 2011). Thus, future research should secure data from both religiously affiliated and non-affiliated individuals, as well as a from a more diverse array of countries, racial/ethnic backgrounds, geographical locations, and age cohorts.

## Appendices

*Appendix A*

Religiosity Scale
Religious Attendance
1. Apart from weddings and funerals, about how often do you attend religious services?

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0 = Never
1 = Once every two years
2 = Once a year
3 = Only on certain holidays (very special holidays, for example Christmas)
4 = On holidays
5 = Once a month
6 = Once a week
7 = More than once a week
8 = Every other day
9 = Everyday

---

*Religious Beliefs*
State the extent to which you agree or disagree with the following statements using the scale provided.

---

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| Strongly Disagree | | | | | | | | Strongly agree | |

---

2. God exists.
3. There is such thing as sin.

4. There is life after death.
5. Every individual has a soul that exists even after one's body dies.
6. There is a hell.
7. There is a heaven.

*Appendix B*

Childhood Religious Experiences with a Peer Inventory (CREPI)

| Read: *Peer's name...* | |
|---|---|
| 01 | … encouraged me to attend a place of worship. |
| 02 | … encouraged me to change my religious beliefs. |
| 03 | … told me that stories in religious texts were true. |
| 04 | … encouraged me to participate in a religious tradition.* |
| 05 | … told me I should believe in God. |
| 06 | … told me about the religious meaning of a holiday. |
| 07 | … encouraged me to pray. |
| 08 | … told me about their religion. |
| 09 | … told me they prayed for me. |
| 10 | … told me religious events are fun. |
| 11 | … told me that when loved ones die they are in a "better place". |
| 12 | … told me they felt the presence of God. |
| 13 | … told me quotes from a religious text. |
| 14 | … and I participated in religious practices at our place of worship. |
| 15 | … attended the same place of worship as me.* |
| 16 | … and I attended a youth group together. |
| 17 | … and I read a religious text together. |
| 18 | … and I prayed together. |
| 19 | …'s religious beliefs made us closer. |
| 20 | … and I sang a religious song together. |
| 21 | … and I discussed our different religious beliefs about the afterlife. |
| 22 | … and I talked about our struggles with our religious beliefs.* |
| 23 | … and I talked about our similar religious beliefs. |
| 24 | … told me we should be tolerant of other religions.* |
| 25 | … and I talked about our interpretations of a religious text. |
| 26 | … and I talked about prayers being effective. |
| 27 | … told me that when loved ones die, our loved ones are still "with us."* |

Items 1-13: Factor I – Peer Proselytization
Items 14-20: Factor II – Shared Activities
Items 21-27: Factor III – Peer Dialogue
*Items removed by confirmatory factor analyses.

Item 4 from the Peer Proselytization subscale (i.e., "My friend encouraged me to participate in a religious tradition") was interpreted as being vague and not contributing additional information to the factor compared to other items (e.g., "My friend encouraged me to change my religious beliefs"; "My friend told me that stories in religious texts were true"), and was therefore removed. Item 15 of the Shared Activities subscale (i.e., "My friend attended the same place of worship as me") was identified as being redundant with other items in the same factor (e.g., "My friend and I participated in religious practices at our place of worship") and not indicative of peer religious influence *per se*. That is, simply attending the same place of worship as a peer may not reflect religious influence from a peer in and of itself. Thus, item 15 was removed. Modification indices suggested significant overlap between item 22 of the Peer Dialogue subscale (i.e., "My friend and I talked about our struggles with our religious beliefs") and two other items, item 2 (i.e., "My friend encouraged me to change my religious beliefs") and item 21 (i.e., "My friend and I discussed our different religious beliefs about the afterlife"). This overlap can be problematic for model fit (Gunzler & Morris, 2015) and, therefore, item 22 was removed for being less informative for the construct of peer religious influence than items 2 and 21. Item 27 from the Peer Dialogue subscale (i.e., "My friend told me that when loved ones die, our loved ones are still 'with us'") was removed due to its redundancy with item 11 (i.e., "My friend told me that when loved ones die they are in a 'better place'"). Furthermore, items 24 (i.e., "My friend told me we should be tolerant of other religions") and 27 (i.e., "My friend told me that when loved ones die, our loved ones are still 'with us'") were removed because they reflect unidirectional peer influence rather than bidirectional peer dialogue and, therefore, do not fit the constitutive definition of the Peer Dialogue subscale compared to other items (e.g., "My friend and I talked about our interpretations of a religious text").

*Appendix C*

Childhood Religious Experiences Inventory - Primary Caregiver (CREI-PC)

| Read: (*Primary Caregiver*)… | |
|---|---|
| 01 | … told me that God has a plan for everything. |
| 02 | … told me that God has blessed our family. |
| 03 | … told me that believing in God will help me through difficult times. |
| 04 | … told me that God loves me. |
| 05 | … told me that my actions made God upset. |
| 06 | … told me that I would suffer in the afterlife if I misbehaved. |
| 07 | … questioned my religious beliefs when they differed from his/her religious beliefs. |

| | |
|---|---|
| 08 | ... told me that I should value religion over science.* |
| 09 | ... signed me up for a religious activity. |
| 10 | ... encouraged me to attend a religious camp. |
| 11 | ... forced me to participate in a religious youth group.* |
| 12 | ... encouraged me to join a religious youth group. |
| 13 | ... allowed me to choose whether or not I attended religious services. |
| 14 | ... told me that she was tolerant of religions that were different than his/hers.* |
| 15 | ... allowed me to choose my own religious beliefs. |
| 16 | ... told me that I could explore other religions. |

Items 1-4: Factor I – Assurance
Items 5-8: Factor II – Disapproval and Punishment
Items 9-12: Factor III – Social Involvement
Items 13-16: Factor IV – Encouraged Skepticism
*Items removed by confirmatory factor analyses.

Item 8 (i.e., "My primary caregiver told me that I should value religion over science") was removed from the Disapproval and Punishment subscale, and Item 14 (i.e., "My primary caregiver told me that he/she was tolerant of religions that were different than his/hers") was removed from the Encouraged Skepticism subscale because they did not represent the constitutive definitions of their corresponding factors as well as other items. For instance, Item 8 does not capture primary caregiver disapproval and punishment content-wise as clearly as other items (e.g., "My primary caregiver told me that I would suffer in the afterlife if I misbehaved"). Similarly, Item 14 does not capture primary caregiver's encouraged skepticism of religion compared toas clearly as other items (e.g., "My primary caregiver allowed me to choose whether or not to attend religious services"), and does not clearly represent a type of influence *per se*, instead reflecting the primary caregiver's own views about the tolerability of other religions. Item 11 (i.e., "My primary caregiver forced me to participate in a religious youth group") was removed due to its redundancy with another item in the subscale (i.e., "My primary caregiver encouraged me to join a religious youth group").

*Appendix D*

Finalized Version of the Childhood Religious Experiences with a Peer (CREPI) Inventory
Directions
In this survey, we refer to religion as a set of beliefs concerning the cause, nature, and purpose of the universe, especially when considered as the creation of a divine agency or agencies, usually involving devotional and ritual practices, and often containing a moral code governing the conduct of human affairs. We are interested in religious experiences during childhood. You will respond to statements regarding religious things that your best friend said to you, did to you, or did with you, throughout your friendship with them while you were growing up (until you turned 18 years old). Thinking over your childhood, identify a person whom you considered your best (or closest) friend while you were growing up (before you turned 18). This friend must be the same sex as you, must have been raised in a different household than you, and less than 10 years older or younger than you. If you had more than one best friend while growing up, please choose the one friend with which you had the closest and longest lasting relationship.

The following statements are about things that (Friend's name) said to you, did to you, or did with you, while you were growing up (from as early as you can remember being friends, until you turned 18 years old).

Read each statement carefully, and then provide a response in each of the columns.

For example: If (Friend's name) told you that apples are healthy frequently, since before you can remember and continued to do so until after you turned 18, you would answer like this:

(Friend's name) told me that apples are healthy.
0 = Never, 1 = One Time, 2 = Rarely, 3 = Sometimes,
4 = Frequently, 5 = Very Frequently, 6 = Always
Inventory Items

| Read: *Peer's name…* | |
|---|---|
| 01 | … encouraged me to attend a place of worship. |
| 02 | … encouraged me to change my religious beliefs. |
| 03 | ... told me that stories in religious texts were true. |
| 04 | ... told me I should believe in God. |
| 05 | ... told me about the religious meaning of a holiday. |
| 06 | ... encouraged me to pray. |
| 07 | ... told me about their religion. |
| 08 | ... told me they prayed for me. |
| 09 | ... told me religious events are fun. |
| 10 | ... told me that when loved ones die they are in a "better place". |
| 11 | ... told me they felt the presence of God. |
| 12 | ... told me quotes from a religious text. |
| 13 | ... and I participated in religious practices at our place of worship. |
| 14 | ... and I attended a youth group together. |
| 15 | ... and I read a religious text together. |
| 16 | ... and I prayed together. |
| 17 | ...'s religious beliefs made us closer. |
| 18 | ... and I sang a religious song together. |
| 19 | ... and I discussed our different religious beliefs about the afterlife. |
| 20 | ... and I talked about our similar religious beliefs. |
| 21 | ... and I talked about our interpretations of a religious text. |
| 22 | ... and I talked about prayers being effective. |

Items 1-12: Factor I – Peer Proselytization
Items 13-18: Factor II – Shared Activities
Items 19-22: Factor III – Peer Dialogue
Scoring

Scores range from 0 to 6 on the 7-point Likert scale. To score the survey items, add the response scores for each of the Likert scale items within each factor. Then compute the average score for each factor using the aggregate scores of their constituent items. For example, to obtain participants' scores for Peer Proselytization (Factor I), add together the scores for items 1-12, and then compute the average score for these items.

*Appendix E*

Finalized Version of the Childhood Religious Experiences Inventory - Primary Caregiver
(CREI-PC)
Directions

In this survey, we refer to religion as a set of beliefs concerning the cause, nature, and purpose of the universe, especially when considered as the creation of a divine agency or agencies, usually involving devotional and ritual practices, and often containing a moral code governing the conduct of human affairs.

We are interested in religious experiences during childhood. You will respond to statements regarding religious things that your **primary caregiver** said to you, did to you, or did with you, while you were growing up (from as early as you can remember, until you turned 18 years old). **Primary caregiver** refers to the person that provided you with the majority of ongoing every-day care while you were growing up. This can be a biological parent, step-parent, aunt, uncle, grandparent, etc.

The following statements are about things that (*Primary Caregiver*) said to you, did to you, or did with you, while you were growing up (from as early as you can remember being friends, until you turned 18 years old). Read each statement carefully, and then provide a response in each of the columns. For example: If (*Primary Caregiver*) told you that apples are healthy frequently, since before you can remember and continued to do so until after you turned 18, you would answer like this:

(*Primary Caregiver*) told me that apples are healthy.
0 = Never, 1 = One Time, 2 = Rarely, 3 = Sometimes,
4 = Frequently, 5 = Very Frequently, 6 = Always
Inventory Items

| Read: (Primary Caregiver)… | |
| --- | --- |
| 01 | … told me that God has a plan for everything. |
| 02 | … told me that God has blessed our family. |
| 03 | … told me that believing in God will help me through difficult times. |
| 04 | … told me that God loves me. |
| 05 | … told me that my actions made God upset. |
| 06 | … told me that I would suffer in the afterlife if I misbehaved. |
| 07 | … questioned my religious beliefs when they differed from his/her religious beliefs. |
| 08 | … signed me up for a religious activity. |
| 09 | … encouraged me to attend a religious camp. |
| 10 | … encouraged me to join a religious youth group. |
| 11 | … allowed me to choose whether or not I attended religious services. |
| 12 | … allowed me to choose my own religious beliefs. |
| 13 | … told me that I could explore other religions. |

Items 1-4: Factor I – Assurance
Items 5-7: Factor II – Disapproval and Punishment
Items 8-10: Factor III – Social Involvement
Items 11-13: Factor IV – Encouraged Skepticism
Scoring

Scores range from 0 to 6 on the 7-point Likert scale. To score the survey items, add the response scores for each of the Likert scale items within each factor. Then compute the average score for each factor using the aggregate scores of their constituent items. For example, to obtain participants' scores for Assurance (Factor I), add together the scores for items 1-4, and then compute the average score for these items.

## References

Alford, J. R., Funk, C. L., & Hibbing, J. R. (2005). Are political orientations genetically transmitted? *American Political Science Review, 99*, 153–167.

Allport, G. W. (1950). *The Individual and his Religion.* New York, NY: Macmillan.

Bandura, A. (1971). *Social Learning Theory.* Morristown, NJ: General Learning Press.

Bandura, A. (2003). Commentary: On the psychosocial impact and mechanisms of spiritual modeling. *International Journal for the Psychology of Religion, 13*, 167–173.

Bengtson, V. L., Copen, C. E., Putney, N. M., & Silverstein, M. (2009). A longitudinal study of the intergenerational transmission of religion. *International Sociology, 24*, 325–345.

Benson, P. L., Roehlkepartain, E. C., & Rude, S. P. (2003). Spiritual development in childhood and adolescence: Toward a field of inquiry. *Applied Developmental Science, 7*, 205–213.

Berndt, T. J. (1979). Developmental changes in conformity to peers and parents. *Developmental Psychology, 15*, 608–616.

Boomsma, D. I., de Geus, E. J. C., van Baal, G. C. M., & Koopmans, J. R. (1999). A religious upbringing reduces the influence of genetic factors on disinhibition: Evidence for interaction between genotype and environment on personality. *Twin Research, 2*, 115–125.

Bouchard, J. T., Jr. (2004). Genetic influence on human psychological traits: A survey. *Current Directions in Psychological Science, 13*, 148–151.

Bouchard, J. T., Jr., & McGue, M. (2003). Genetic and environmental influences on human psychological differences. *Journal of Neurobiology, 54*, 4–45.

Boyatzis, C. J., Dollahite, D. C., & Marks, L. D. (2006). The family as a context for religious and spiritual development in children and youth. In E. C. Roehlkepartain, P. E. King, L. Wagener, & P. L. Benson (Eds.). *The Handbook of Spiritual Development in Childhood and Adolescence* (pp. 297–309). (Eds.). Sage.

Boyatzis, C. J., & Janicki, D. L. (2003). Parent-child communication about religion: Survey and diary data on unilateral transmission and bi-directional reciprocity styles. *Review of Religious Research, 44*, 252–270.

Bradshaw, M., & Ellison, C. G. (2008). Do genetic factors influence religious life? Findings

from a behavior genetic analysis of twin siblings. *Journal for the Scientific Study of Religion, 47*, 529–544.

Braswell, G. S., Rosengren, K. S., & Berenbaum, H. (2012). Gravity, God and ghosts? Parents' beliefs in science, religion, and the paranormal and the encouragement of beliefs in their children. *International Journal of Behavioral Development, 36*, 99–106.

Buss, D. M., & Craik, K. H. (1983). The act frequency approach to personality. *Psychological Review, 90*, 105–126.

Cavalli-Sforza, L. L., Feldman, M. W., Chen, K. H., & Dornbusch, S. M. (1982). Theory and observation in cultural transmission. *Science, 218*, 19–27.

Copen, C., & Silverstein, M. (2007). Transmission of religious beliefs across generations: Do grandparents matter? *Journal of Comparative Family Studies, 38*, 497–510.

Cornwall, M. (1988). The influence of three agents of religious socialization: Family, church, and peers. *The Religion and Family Connection, 16*, 207–231.

Cornwall, M. (1989). The determinants of religious behavior: A theoretical model and empirical test. *Social Forces, 68*, 572–592.

Cutting, M., & Walsh, M. (2008). Religiosity scales: What are we measuring in whom? *Archive for the Psychology of Religion, 30*, 137–153.

Desrosiers, A., Kelley, B. S., & Miller, L. (2011). Parent and peer relationships and relational spirituality in adolescents and young adults. *Psychology of Religion and Spirituality, 3*, 39–54.

De Vaus, D. A. (1983). The relative importance of parents and peers for adolescent religious orientation: An Australian study. *Adolescence, 18*, 147–158.

Dollahite, D. C., & Thatcher, J. Y. (2008). Talking about religion: How highly religious youth and parents discuss their faith. *Journal of Adolescent Research, 23*, 611–641.

Donelson, E. (1999). Psychology of religion and adolescents in the United States: Past to present. *Journal of Adolescence, 22*, 187–204.

D'Onofrio, B. M., Eaves, L. J., Murrelle, L., Maes, H. H., & Spilka, B. (1999). Understanding biological and social influences on religious affiliation, attitudes, and behaviors: A behavior genetic perspective. *Journal of Personality, 67*, 953–984.

Eaves, L. J., Hatemi, P. K., Prom-Womley, E. C., & Murrelle, L. (2008). Social and genetic influences on adolescent religious attitudes and practices. *Social Forces, 86*, 1621–1646.

Erickson, J. A. (1992). Adolescent religious development and commitment: A structural equation model of the role of family, peer group, and educational influences. *Journal for the Scientific Study of Religion, 31*, 131–152.

Flor, D., & Knapp, N. (2001). Transmission and transaction: Predicting adolescents' internalization of parental religious values. *Journal of Family Psychology, 15*, 627–645.

French, D. C., Purwono, U., & Triwahyuni, A. (2011). Friendship and the religiosity of Indonesian Muslim adolescents. *Journal of Youth and Adolescence, 40*, 1623–1633.

Gelman, A. (2013). P values and statistical practice. *Epidemiology, 24*, 69–72.

Gillespie, V. B. (1991). *The Dynamics of Religious Conversion: Identity and Transformation.* Birmingham, AL: Religious Education Press.

Gunnoe, M. L., & Moore, K. A. (2002). Predictors of religiosity among youth aged 17–22: A longitudinal study of the National Survey of Children. *Journal for the Scientific Study of Religion, 41*, 613–622.

Gunzler, D. D., & Morris, N. (2015). A tutorial on structural equation modeling for analysis of overlapping symptoms in co-occurring conditions using MPlus. *Statistics in Medicine, 34*, 3246–3280.

Hallinan, M. T., & Williams, R. A. (1990). Students' characteristics and the peer-influence process. *Sociology of Education, 63*, 122–132.

Harris, J. R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review, 102*, 458–489.

Harris, J. R. (2011). *The nurture assumption: Why children turn out the way they do.* New York, NY: Simon and Schuster.

Hayes, B. C., & Pittelkow, Y. (1993). Religious belief, transmission, and the family: An Australian study. *Journal of Marriage and the Family, 55*, 755–766.

Henry, B., Moffitt, T. E., Caspi, A., Langley, J., & Silva, P. A. (1994). On the" remembrance of things past": a longitudinal evaluation of the retrospective method. *Psychological Assessment, 6*, 92.

Himmelfarb, H. S. (1979). Agents of religious socialization among American Jews. *Sociological Quarterly, 20*, 477–494.

Hoge, D. R., Petrillo, G. H., & Smith, E. I. (1982). Transmission of religious and social values from parents to teenage children. *Journal of Marriage and the Family, 44*, 569–580.

Hood, R. W., Jr., Hill, P. C., & Spilka, B. (2018). *The Psychology of Religion: An Empirical Approach.* New York, NY: Guilford Publications.

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*, 53–60.

Hunsberger, B., & Brown, L. B. (1984). Religious socialization, apostasy, and the impact of family background. *Journal for the Scientific Study of Religion, 23*, 239–251.

Hyde, K. E. (1990). *Religion in Childhood and Adolescence: A Comprehensive Review of the Research.* Religious Education Press.

Inglehart, R., Haerpfer, C., Moreno, A., Welzel, C., Kizilova, K., & Diez-Medrano, J. (2014). World Values Survey: Round Six - Country-Pooled Datafile Version. In M. Lagos, P. Norris, E. Ponarin, & B. Puranen (Eds.). (eds.). Madrid: JD Systems Institutehttp://www.worldvaluessurvey.org/WVSDocumentationWV6.jsp.

Kelley, B. S., Athan, A. M., & Miller, L. F. (2007). Openness and spiritual development in adolescents. *Research in the Social Scientific Study of Religion, 18*, 3–33.

Kelley, J., & De Graaf, N. D. (1997). National context, parental socialization, and religious belief: Results from 15 nations. *American Sociological Review, 62*, 639–659.

Kelley, J. (2015). National Context, Parental Socialization, and Religious Belief in 38 Nations as of 2008: The End of National Exceptionalism? *Polish Sociological Review, 191*, 295–314.

Kim-Spoon, J., Longo, G. S., & McCullough, M. E. (2012). Parent-adolescent relationship quality as a moderator for the influences of parents' religiousness on adolescents' religiousness and adjustment. *Journal of Youth and Adolescence, 41*, 1576–1587.

Kirkpatrick, L. A. (1998b). God as a substitute attachment figure: A longitudinal study of adult attachment style and religious change in college students. *Personality and Social Psychology Bulletin, 24*, 961–973.

Kirkpatrick, L. A., & Shaver, P. R. (1990). Attachment theory and religion: Childhood attachments, religious beliefs and conversions. *Journal for the Scientific Study of Religion, 29*, 315–334.

Koenig, L. B., McGue, M., Krueger, R. F., & Bouchard, T. J., Jr. (2005). Genetic and environmental influences on religiousness: Findings for retrospective and current religiousness ratings. *Journal of Personality, 73*, 471–488.

Kose, A. (1996). Religious conversion: Is it an adolescent phenomenon? The case of native British converts to Islam. *The International Journal for the Psychology of Religion, 6*, 253–262.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*, 130–149.

Madsen, G. E., & Vernon, G. M. (1983). Maintaining the faith during college: A study of campus religious group participation. *Review of Religious Research, 25*, 127–141.

Martin, N. G., Eaves, L. J., Heath, A. C., Jardine, R., Feingold, L. M., & Eysenck, H. J. (1986). Transmission of social attitudes. *Proceedings of the National Academy of Sciences, 83*, 4364–4368.

Martin, T. F., White, J. M., & Perlman, D. (2003). Religious socialization: A test of the channeling hypothesis of parental influence on adolescent faith maturity. *Journal of Adolescent Research, 18*, 169–187.

Myers, S. M. (1996). An interactive model of religiosity inheritance: The importance of family context. *American Sociological Review, 61*, 858–866.

O'Hara, J. P. (1980). A research note on the sources of adult church commitment among those who were regular attenders during childhood. *Review of Religious Research, 21*, 462–467.

Ozorak, E. W. (1989). Social and cognitive influences on the development of religious beliefs and commitment in adolescence. *Journal for the Scientific Study of Religion, 28*, 448–463.

Patacchini, E., & Zenou, Y. (2016). Social networks and parental behavior in the intergenerational transmission of religion. *Quantitative Economics, 7*, 969–995.

Peer, E., Vosgerau, J., & Acquisti, A. (2013). Reputation as a sufficient condition for data quality on Amazon Mechanical Turk. *Behavior Research Methods, 46*, 1–9.

Regnerus, M. D., Smith, C., & Smith, B. (2004). Social context in the development of adolescent religiosity. *Applied Developmental Science, 8*, 27–38.

Schwadel, P. (2010). Period and cohort effects on religious nonaffiliation and religious disaffiliation: A research note. *Journal for the Scientific Study of Religion, 49*, 311–319.

Schwadel, P. (2011). Age, period, and cohort effects on religious activities and beliefs. *Social Science Research, 40*, 181–192.

Schwartz, K. D. (2006). Transformations in Parent and Friend Faith Support Predicting Adolescents' Religious Faith. *The International Journal for the Psychology of Religion, 16*, 311–326.

Schwartz, K. D., Bukowski, W. M., & Aoki, W. T. (2006). Mentors, friends, and gurus: Peer and nonparent influences on spiritual development. In E. C. Roehlkepartain, P. E. King, L. Wagener, & P. L. Benson (Eds.). *The Handbook of Spiritual Development in Childhood and Adolescence* (pp. 310–323). Sage.

Sherkat, D. E. (2001). Tracking the restructuring of American religion: Religious affiliation and patterns of religious mobility, 1973–1998. *Social Forces, 79*, 1459–1493.

Smith, C., Denton, M. L., Faris, R., & Regnerus, M. (2002). Mapping American adolescent religious participation. *Journal for the Scientific Study of Religion, 41*, 597–612.

Smith, C., & Sikkink, D. (2003). Social predictors of retention in and switching from the religious faith of family of origin: Another look using religious tradition self-identification. *Review of Religious Research, 45*, 188–206.

Tamminen, K. (1994). Religious experiences in childhood and adolescence: A viewpoint of religious development between the ages of 7 and 20. *The International Journal for the Psychology of Religion, 4*, 61–85.

Thomas, D. L., & Cornwall, M. (1990). Religion and family in the 1980s: Discovery and development. *Journal of Marriage and the Family, 52*, 983–992.

Tratner, A. E., Sela, Y., Lopes, G. S., Ehrke, A., Weekes-Shackelford, V. A., & Shackelford, T. K. (2017a). Development and initial psychometric assessment of the Childhood Religious Experience Inventory – Primary Caregiver. *Personality and Individual Differences, 114*, 5–9.

Tratner, A. E., Sela, Y., Lopes, G. S., Ehrke, A., Weekes-Shackelford, V. A., & Shackelford, T. K. (2017b). Individual Differences in Childhood Religious Experiences with Peers. *Personality and Individual Differences, 119*, 73–77.

Turkheimer, E., & Waldron, M. (2000). Nonshared environment: A theoretical, methodological, and quantitative review. *Psychological Bulletin, 126*, 78–108.

Uecker, J. E., Regnerus, M. D., & Vaaler, M. L. (2007). Losing my religion: The social sources of religious decline in early adulthood. *Social Forces, 85*, 1667–1692.

Van Tubergen, F. (2006). Religious affiliation and attendance among immigrants in eight western countries: Individual and contextual effects. *Journal for the Scientific Study of Religion, 45*, 1–22.

Waller, N. G., Kojetin, B. A., Bouchard, T. J, Jr., Lykken, D. T., & Tellegen, A. (1990). Genetic and environmental influences on religious interests, attitudes, and values: A study of twins reared apart and together. *Psychological Science, 1*, 138–142.

Weeden, J., & Kurzban, R. (2013). What predicts religiosity? A multinational analysis of reproductive and cooperative morals. *Evolution and Human Behavior, 34*, 440–445.

Wozniak, P. R. (1984). Making sociobiological sense out of sociology. *Sociological Quarterly, 25*, 191–204.