



## Development and initial psychometric assessment of the Childhood Religious Experience Inventory – Primary Caregiver



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### ABSTRACT

Childhood religious experiences with primary caregivers are instrumental in the development of religiosity. However, the ways that primary caregivers influence these experiences have not been properly operationalized and measured. We addressed this limitation by developing the Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC). An act nomination procedure (Study 1,  $n = 201$ ) resulted in 120 items describing specific things a primary caregiver said to, did to, or did with, a participant during their childhood. In Study 2 ( $n = 497$ ), participants indicated how frequently each item occurred in their childhood. Principal Component Analysis yielded 16 items loading on four components: *Assurance*; *Disapproval and Punishment*; *Social Involvement*, and *Encouraged Skepticism*. The CREI-PC allows researchers to quantify primary caregiver influence on childhood religious experiences, enabling future investigation of whether and how these influences predict adult religiosity.

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Religious experiences during childhood and adolescence influence individuals' adulthood religiosity (Erickson, 1992; Madsen & Vernon, 1983; O'Hara, 1980). Childhood and adolescence are important times for the acquisition of religious beliefs, because children and adolescents are subject to frequent exposure to religion both within and outside the home (Cornwall, 1988, 1989; Erickson, 1992; Francis, 1993; Kutschera, 2008; Madsen & Vernon, 1983; Thomas & Cornwall, 1990). Because religiosity is moderately heritable (D'Onofrio, Eaves, Murrelle, Maes, & Spilka, 1999; Koenig, McGue, Krueger, & Bouchard, 2005), development of religious beliefs are partially attributed to environmental influences, such as peer and familial interactions (e.g., Gunnoe & Moore, 2002; Koenig et al., 2005). Previous research has documented familial influences on the development of several psychological traits (e.g., personality, values; Kim-Spoon, Longo, & McCullough, 2012; Schneider, DeWinne, & Overton, 1980), including religious beliefs and practices (e.g., Francis, 1993; Myers, 1996). A number of studies have investigated the role of parents in influencing children's religious beliefs (Mahoney, Pargament, Tarakeshwar, & Swank, 2001), indicating that parents play a unique and instrumental role in shaping their children's religious beliefs (Erickson, 1992; Martin, White, & Perlman, 2003).

Parents influence the development of their children's religiosity in several ways, including exposing their children to religious social groups and instilling their religious beliefs (Braswell, Rosengren, &

Berenbaum, 2012; Clark, Worthington, & Danser, 1988; Ozorak, 1989). Although the majority of studies focus on the influence of biological parents on children's religiosity (Mahoney et al., 2001), some studies have considered the influence of other primary caregivers (e.g., step-parents; Benda & Corwyn, 1997; Lau & Wolfinger, 2011). A *primary caregiver* refers to a person who provides the majority of ongoing daily care for a child. For the purposes of this article, we refer to "primary caregivers" rather than "parents," because individuals are sometimes raised by relatives other than their parents (e.g., grandmothers) and non-relatives (e.g., godmothers, legal guardians).

Previous research examining the influence of primary caregivers on children's religious socialization has been limited in several ways. Some studies assessed religious influence of primary caregivers using general, sometimes vague questions (e.g., Gunnoe & Moore, 2002; "How important is it for you to provide religious training for your children?"). Many studies relied on single-item measures of religious influence. For example, "Do you talk to your children about religion?" (Woolley, Cornelius, & Lacy, 2011) and "Rate the importance of religious faith in daily life" (Koenig et al., 2005) do not capture important facets of influence that primary caregivers may have on the development of children's religiosity, such as exposure to religious groups. When more detailed questions have been asked regarding the beliefs that primary caregivers endorsed to their children, previous research neglected to explore *how* primary caregivers achieved this (e.g., Braswell et al., 2012; "Which of the following beliefs do adults in your household actively encourage or discourage in your child?"). In addition, most studies do not specify the frequency of primary caregiver's attempts to affect such influence.

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Further, the psychometric parameters of these measures have not been explored (e.g., Gunnoe & Moore, 2002) and, therefore, these measures are of unknown reliability and validity (Nunnally & Bernstein, 1994).

The development of a measure, using self-reported experiences, that assesses the specific ways that primary caregivers influence childhood religious experiences is warranted. Investigating the religious influence of primary caregivers on children by assessing specific childhood religious experiences is useful for several reasons. Exploring childhood religious experiences with primary caregivers, and documenting the specific ways that primary caregivers affect this influence will allow the development of a valid measure (content and construct validity; Nunnally & Bernstein, 1994). The frequency of primary caregiver behaviors is an important attribute of the construct; quantifying it, therefore, will improve the measure's reliability (Nunnally & Bernstein, 1994). To our knowledge, no measure assesses how primary caregivers (parents or otherwise) influence childhood religious experiences. The goal of the current research is to develop a psychometrically sound measure that assesses the specific ways a primary caregiver influences the development of a child's religious beliefs: The Childhood Religious Experience Inventory – Primary Caregiver (CREI-PC).

## 1. Method

### 1.1. Study 1: act nomination of childhood religious experiences with primary caregivers

#### 1.1.1. Participants and procedure

We recruited 201 undergraduates from the human subjects pool at a large US Midwestern university for an online survey. Prospective participants were provided a link to a consent form, and those who electronically signed the consent form, and indicated that they were at least 18 years old, could access the survey. Participants took part in this study to meet research participation requirements in undergraduate Introductory Psychology and Research Methods courses.

Using an act nomination procedure (Buss & Craik, 1983), we asked participants to list 10–15 specific things their primary caregiver (e.g., a parent) did with, did to, and/or said to them during their lives (i.e., “childhood through the present”) that they thought had affected their religious beliefs and practices today (e.g., “My mother encouraged me to go to Church every Sunday”; “My father and I prayed before meals”; “My grandmother criticized me for breaking a Biblical rule”). *Primary caregiver* refers to the person that provided the majority of on-going daily care while the participant was growing up. We used “primary caregiver” rather than “parent” because individuals are sometimes raised by relatives other than their parents (e.g., grandmothers), and sometimes by non-relatives (e.g., godmothers, legal guardians).

#### 1.1.2. Results and discussion

We collected 2016 responses. Following Buss (1988), a team of four research assistants consolidated the responses by independently inspecting them and deleting vague, redundant, and irrelevant acts. This process resulted in a list of 120 acts, such as “[Primary Caregiver] told me I should use a religious text as a guide for life”, “[Primary Caregiver] pointed out contradictions within my religion”, and “[Primary Caregiver] and I volunteered for a religious organization”. We used the acts in Study 2 as the preliminary list of items in the *Childhood Religious Experiences Inventory – Primary Caregiver*.

### 1.2. Study 2: psychometric assessment of the Childhood Religious Experience Inventory – Primary Caregiver

#### 1.2.1. Participants

We recruited 497 participants from Amazon's Mechanical Turk for an online survey. Participants were between 18 and 34 years ( $M = 16.9$ ;  $SD = 8.7$ ), slight majority female (52.7%) and mostly Christian

(43.9%). Participants had to choose a primary caregiver (see Materials). Participants primarily chose their biological mother (93.3%).

#### 1.2.2. Materials

Participants completed an online questionnaire composed of the preliminary version of the Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC; 120 items). Participants were asked to identify a *primary caregiver*, and to indicate the frequency with which they experienced each of the 120 items with that caregiver, on a 7-point Likert scale (0 = *Never*, 6 = *Always*). We asked participants to indicate their relationship with the primary caregiver (e.g., biological mother, adoptive mother, biological father, step-father, maternal aunt, paternal grandfather). The online survey automatically inserted the primary caregiver (e.g., biological mother, step-mother) into each item based on the participant's initial response. The goal of this personalized questionnaire was to provide a reminder of the primary caregiver about whom participants were responding. Participants provided demographic information about themselves and their primary caregiver (e.g., age, sex, religious affiliation).

#### 1.2.3. Procedure

Prospective participants viewed an advertisement for the study on MTurk's job listings. We implemented MTurk filters recommended by Peer, Vosgerau, and Acquisti (2013): MTurk participants could access and participate in this study if they had successfully completed at least 95% of at least 500 accessed MTurk jobs.

#### 1.2.4. Results and discussion

An analysis of histograms and error bars indicated 33 items (of 120) showing considerably low variance (i.e., >70% of participants scored “0”). Examples of items are “[Primary Caregiver] made fun of my religious beliefs” and “[Primary Caregiver] forced me to pray.” We excluded these items from further analyses. We next evaluated the discriminative power of the remaining 87 items, considering the median total score as the dividing point. We calculated the total score across items for each participant, then divided these scores into two criterion groups (i.e., those above and those below the median;  $Mdn = 1.59$ ). We entered the items into a MANOVA to evaluate differences in their mean scores (dependent variables) between the criterion groups. We rejected the null hypothesis [i.e., no difference in mean scores of the items for the criterion groups;  $Wilks' \Lambda = 0.208$ ,  $F(87, 409) = 17.896$ ,  $p < 0.001$ ,  $p^2 = 0.792$ ]. Univariate tests (between-subjects) effects indicated that all items discriminated between individuals who scored high versus low on the overall scale ( $ps \leq 0.05$ ).

Kaiser-Meyer-Olkin (0.975) and Bartlett's sphericity tests [ $\chi^2(3741) = 40,218.20$ ,  $p < 0.001$ ] supported the suitability of the data for Principal Components Analysis (PCA). The former indicates the total variance that might be caused by a common factor, with 0.50 suggested as the minimum acceptable value (Kaiser, 1970), whereas the latter indicates the existence of correlations in the data set by testing the null hypothesis that all variables are uncorrelated. We then proceeded with a PCA without setting the number of components to be extracted. We found 11 components meeting the Kaiser criterion (eigenvalue  $\geq 1$ ), explaining 69.0% of total variance. However, the scree plot (Cattell criterion) suggested five components, a suggestion corroborated by the results of a parallel analysis (Horn criterion). The parallel analysis generates randomized data with the same parameters of the observed data (i.e., 497 participants and 87 variables). The Horn criterion suggests retention of components for which the eigenvalue in the observed data is greater than the associated eigenvalue in the randomized data (Horn, 1965).

Component extraction criteria suggested different numbers of components for extraction, but because the Horn criterion is the most rigorous (Garrido, Abad, & Ponsoda, 2013) and two of three criteria (Cattell and Horn) suggested a five-component structure, we performed another PCA, setting the number of components to five and following with oblimin rotation. We considered a cutoff of 0.5 for component loadings

(Hair, Black, Babin, Anderson, & Tatham, 2006). Twenty-two items (out of 87) did not saturate in any component (e.g., “My [Primary Caregiver] pointed out the differences between her religious beliefs and others’ religious beliefs”), and were excluded from further analyses. Additionally, the fifth component included only two items. Because the purpose of the PCA is to identify relevant components underlying a construct, we conducted a final PCA with the 65 remaining items, setting the number of components to four, and following with oblimin rotation. The four components explained 62.3% of the total variance. Two items did not saturate in any component and were excluded (e.g., “My [Primary Caregiver] asked me to help decorate the house with religious decorations”).

We eliminated redundancies among the remaining items by identifying item pairs correlated above 0.8, and excluding the item with the lower factor loading in each pair. For example, the items “[Primary Caregiver] told me that if I have a problem, God will have the answer” and “[Primary Caregiver] told me that if I have a problem, God will protect me” correlated at  $r = 0.85$ . We deleted the former because it showed a lower factor loading (0.81) compared to the latter (0.84) in the component they saturated. This procedure resulted in the deletion of 11 items. This preliminary version of the CREI-PC included 54 items along four components (available upon request).

We labeled Component 1 “Assurance” because its constituent items involved positively valenced attempts to console and persuade an individual to adopt religious beliefs (e.g., “[Primary Caregiver] told me that God has a plan for everything”). We labeled Component 2 “Disapproval and Punishment” because its constituent items involved a primary caregiver’s direct derogation or disapproval of an individual’s beliefs (e.g., “[Primary Caregiver] told me that my actions made God upset”). We labeled Component 3 “Social Involvement” because its constituent items involved facilitating individuals’ participation in religious activities (e.g., “[Primary Caregiver] signed me up for a religious activity”). Lastly, we labeled Component 4 “Encouraged Skepticism” because its constituent items involved encouraging an individual to freely explore and consider other religious beliefs (e.g., “[Primary Caregiver] told me that I could explore other religions”).

For parsimony, we next retained only the four items with the highest component loadings for each component. The excluded items, although statistically acceptable, were not essential to the constitutive definition

of the component in which they saturated. That is, their deletion did not cause loss of valuable information for the component. For example, the item “[Primary Caregiver] read religious stories to me” saturated the component “Assurance”. However, the component “Assurance” does not depend on this item to be operationalized in a comprehensive way, since a primary caregiver may provide assurance of religious support without reading religious stories, for example.

Additionally, the retained items are general enough to provide a comprehensive operationalization of the component, but not so general as to overlap with other components. For example, the item “[Primary Caregiver] told me that God has a plan for everything” (Component 1) is general enough to suggest “Assurance” on a comprehensive basis, but not so general that it could, for example, represent the component “Social Involvement”. Similarly, the item “[Primary Caregiver] allowed me to choose my own religious beliefs” indicates “Encouraged Skepticism” (Component 4), but its unique content does not overlap with the definition of any other component, such as “Disapproval and Punishment” (Component 2). The final version of the CREI-PC included 16 items, organized in four components. The items’ component loadings and communalities ( $h^2$ ) are summarized in Table 1.

As part of the evaluation of the construct validity of the CREI-PC, we performed a MANOVA to investigate sex differences in the frequency of different components of primary caregiver influence on childhood religious experiences. The results indicated non-significant sex differences [Wilks’ Lambda = 0.99,  $F(4, 492) = 1.44, p = 0.218$ ]. Additionally, we performed a MANOVA to investigate differences between religiously affiliated individuals (e.g., Christians, Muslims, Jews) and non-affiliated individuals (e.g., atheists) in the frequency of different components of primary caregiver influence on childhood religious experiences. The results indicated that religiously affiliated and non-affiliated individuals experienced primary caregiver influence differently [Wilks’ Lambda = 0.91,  $F(4, 492) = 12.65, p < 0.001$ ]. Specifically, tests of between-subjects effects indicated the following: religiously affiliated (vs. non-affiliated) individuals experienced greater primary caregiver influence through Assurance [ $F(1, 495) = 38.01, p < 0.001; p^2 = 0.07$ ] and Social Involvement [ $F(1, 495) = 6.04, p = 0.014; p^2 = 0.01$ ], and lesser primary caregiver influence through Encouraged Skepticism [ $F(1, 495) = 3.35, p = 0.068; p^2 = 0.01$ , marginally significant; Gelman, 2013].

**Table 1**  
Component structure and loadings of the CREI-PC items ( $n = 497$ ).

Item	Description	Component loadings				$h^2$
		I	II	III	IV	
01	... told me that God has a plan for everything.	<b>0.83</b>	0.06	−0.05	0.01	0.71
02	... told me that God has blessed our family.	<b>0.87</b>	−0.06	−0.05	0.05	0.67
03	... told me that believing in God will help me through difficult times.	<b>0.87</b>	0.06	−0.05	−0.02	0.78
04	... told me that God loves me.	<b>0.92</b>	−0.16	0.05	0.01	0.77
05	... told me that my actions made God upset.	0.00	<b>0.70</b>	0.13	−0.05	0.58
06	... told me that I would suffer in the afterlife if I misbehaved.	−0.02	<b>0.73</b>	0.04	−0.07	0.56
07	... questioned my religious beliefs when they differed from his/her religious beliefs.	−0.02	<b>0.75</b>	0.07	−0.03	0.60
08	... told me that I should value religion over science.	0.04	<b>0.78</b>	0.07	0.03	0.67
09	... signed me up for a religious activity.	0.12	0.09	<b>0.68</b>	−0.07	0.64
10	... encouraged me to attend a religious camp.	0.02	0.08	<b>0.68</b>	0.08	0.53
11	... forced me to participate in a religious youth group.	−0.10	0.27	<b>0.70</b>	−0.01	0.60
12	... encouraged me to join a religious youth group.	0.18	0.03	<b>0.72</b>	−0.01	0.70
13	... allowed me to choose whether or not I attended religious services.	0.12	−0.01	−0.30	<b>0.60</b>	0.45
14	... told me that she was tolerant of religions that were different than his/hers.	0.14	−0.08	0.19	<b>0.72</b>	0.56
15	... allowed me to choose my own religious beliefs.	0.05	−0.15	−0.10	<b>0.72</b>	0.59
16	... told me that I could explore other religions.	−0.18	0.08	0.16	<b>0.74</b>	0.55
	Eigenvalue	30.6	4.1	3.5	2.4	
	Explained variance (%)	47.1	6.3	5.4	3.6	
	Internal consistency (Cronbach’s alpha)	0.86	0.83	0.86	0.72	
	Mean	2.51	1.09	1.28	2.07	
	Standard deviation	2.01	1.43	1.51	1.62	
	Kurtosis	0.21	1.54	1.09	0.48	
	Skewness	−1.24	1.97	0.20	−0.58	

Note: Bolded numbers refer to the factor loading of each tactic in its respective component.

## 2. General discussion

The current studies employed well-established methods to develop the Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC). In Study 1, we used an act nomination procedure and act frequency analysis of childhood religious experiences with primary caregivers as a preliminary criterion for category membership. Thus, the CREI-PC is comprised of specific childhood religious experiences with primary caregivers, which strengthens its content validity. In Study 2, we employed Principle Components Analysis to explore the structure of the CREI-PC, which allowed us to secure further evidence of its validity (Nunnally & Bernstein, 1994).

Most extant measures of religious experiences focus on aspects such as religious support (e.g., Spiritual Support Scale; Maton, 1989; Religious Support Scale; Fiala, Bjorck, & Gorsuch, 2002) and spiritual development (e.g., Religious Maturity Scale; Leak & Fish, 1999). Three components of the CREI-PC coincide with previously developed measures. Assurance and Social Involvement are conceptually similar to subscales that assess religious consolation (e.g., Religious Support Scale; Fiala et al., 2002), and involvement with a religious community (e.g., Religious Commitment Inventory; Worthington et al., 2003), respectively. Encouraged Skepticism is conceptually similar to the Quest subscale of the Revised Religious Life Inventory (Hills, Francis, & Robbins, 2005) with respect to measuring openness to exploring other religions and belief systems. Taken together, our findings both corroborate previously developed measures assessing specific types of religious experiences, and highlight the specific ways that primary caregivers influence childhood religious experiences.

Disapproval and Punishment, however, is conceptually novel; to our knowledge, no other measure assesses a primary caregiver's proselytization and criticism of a child's religious beliefs (or lack thereof). This may be an important but understudied facet of primary caregiver influence on childhood religious experiences. Therefore, the CREI-PC is a more inclusive measure of primary caregiver's influence, expanding the scope of investigation of childhood religious experiences. The CREI-PC also affords retrospective assessment of childhood religious experiences that may be important for acquisition of religious beliefs. Having conceptually different components that comprise a single, psychometrically-validated measure will allow profitable future investigation of the ways in which primary caregivers influence childhood religious experiences. Further, the CREI-PC is amenable to cross-cultural investigations within Abrahamic religions. For example, researchers could investigate whether primary caregivers in different cultures influence childhood religious experiences through disapproval of a child's beliefs (Disapproval and Punishment) as opposed to allowing children to explore other religions (Encouraged Skepticism).

We investigated differences between religiously affiliated and non-affiliated individuals in the frequency of different components of primary caregiver influence on childhood religious experiences.

Religiously affiliated (vs. non-affiliated) individuals were more influenced by Assurance and Social Involvement, likely due to the two components representing positively valenced religious influence. For example, Assurance involves attempts to convince an individual to adopt religious beliefs through consolation, and Social Involvement involves facilitating participation in religious activities. Additionally, religiously non-affiliated individuals experienced greater Encouraged Skepticism, perhaps because this component involves encouraging an individual to freely explore and consider other religious beliefs, suggesting greater tolerance of different religious belief systems. Most importantly, there were no differences in experienced Disapproval and Punishment between religiously affiliated and non-affiliated individuals, suggesting that primary caregiver's direct derogation or disapproval of an individual's beliefs does not particularly affect a child's likelihood of affiliating with a religion in adulthood. These results may be useful in practical contexts, such as in developing educational and counseling programs (e.g., educating parents on religious socialization).

### 2.1. Limitations and future directions

The current studies have several limitations. First, we asked participants about one primary care giver. However, different and/or multiple caregivers (e.g., biological mothers, fathers, step-parents) may influence religious beliefs differently. For example, mothers' (compared to fathers') religiosity is a better predictor of religious involvement and religious outcomes throughout childhood and adolescence (Francis, 1993; Gunnoe & Moore, 2002). Future research could investigate why mothers' influence is particularly important for the development of religious beliefs, and the specific ways in which mothers are involved in religious socialization. We recommend that future studies have participants complete the CREI-PC separately for different caregivers.

There are two religion-specific features in the items of the CREI-PC: 1) the existence of one God (e.g., items 01, 02, and 04; see Table 1), and 2) the possibility of an afterlife (item 06; see Table 1). Although this may restrict the usage of the CREI-PC from polytheistic (e.g., Hinduism) and other non-Abrahamic religions (e.g., Buddhism), the CREI-PC could be a useful instrument within the context of Abrahamic religions. Another limitation is related to the samples: undergraduates (Study 1), and adult MTurk workers (Study 2) residing in the United States. Although the MTurk sample was relatively heterogeneous (e.g., nearly even split of men and women, a variety of religious denominations), all participants resided in the United States, and most were Caucasian and Christian. However, these samples improved upon previous research that has relied on college convenience samples (Cutting & Walsh, 2008). Finally, participants answered questions about childhood experiences, and these recollections may have been incomplete or inaccurate (Williams, 1994; Hyman & Billings, 1998; Winkelman & Schwarz, 2001). Future research should secure data from similar and different demographic groups and cultures to investigate whether the four-component structure replicates within different groups in the same culture and also in different cultures.

### 2.2. Conclusion

We developed and provided initial psychometric validation for a measure of childhood religious experiences with primary caregivers, the Childhood Religious Experiences Inventory – Primary Caregiver (CREI-PC). The CREI-PC is a quantitative tool that secures occurrence frequencies for 16 specific childhood religious experiences with a primary caregiver, organized into four components: Assurance, Disapproval and Punishment, Social Involvement, and Encouraged Skepticism. The CREI-PC allows the investigation of new research avenues to test hypotheses about the development, transmission, and acquisition of religiosity via primary caregivers. The current research contributes to the literature by integrating and expanding on different facets of a primary caregiver's influences on religious experience during childhood and adolescence.

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