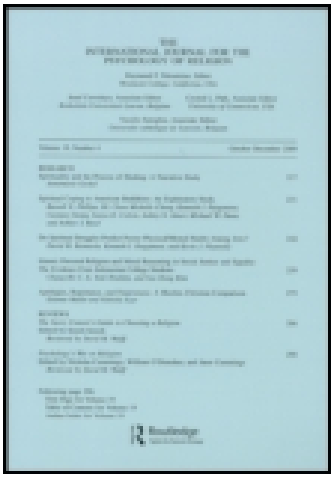
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Measuring Religious Attitudes in Secularized Western European Context: A Psychometric Analysis of the Post-Critical Belief Scale

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RESEARCH

Measuring Religious Attitudes in Secularized Western European Context: A Psychometric Analysis of the Post-Critical Belief Scale

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Wulff's two-dimensional model of approaches to religion was an inspiration for the development of the Post-Critical Belief Scale (PCBS), an instrument measuring religious attitudes, that is, "paradigms of religious belief structure" in a secularized Western European context. The scale

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has been frequently used in psychological studies, has undergone psychometric analyses and modifications, and has been translated into several languages. The current study shows results of a psychometric analysis of the component structure of PCBS in different age groups over time using Clusterwise Simultaneous Component Analysis-Equal Cross-Product (SCA-ECP). The analysis was based on samples collected in Flanders (Belgium; $N = 14{,}599$). The one-cluster and two-cluster models yielded three components: Literal Affirmation, Literal Disaffirmation, and Symbolic Attitude, and there were no differences between age groups. In the two-cluster model, subtle differences between samples collected before and after 2002 were found, and these were related to two PCBS items referring to interpretation of Biblical stories. Our finding of a generalized Symbolic Attitude might be related to the changes in the approaches to religion in secularized Western Europe, and might capture the religious (dis-)belief of individuals who are open and tolerant to other religious systems, or alternatively, have become indifferent to them. Further cross-cultural and longitudinal studies are needed to better understand the religious attitudes in a secularized context, and the development of a new scale based on the paradigm of personal meaning systems is suggested

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INTRODUCTION

The religious landscape of Belgium, a traditionally Roman Catholic country, has been evolving over the last three decades (Boeve, 2006, 2008). There have been significant changes regarding the content of individuals' beliefs and the ways religion is practiced in public and private domains. Between 1981 and 2009, the percentage of regular churchgoers decreased from 30% to 11%, and the percentage of individuals believing in God has decreased from 77% to 57% (Abts, Dobbelaere, & Voyé, 2011). Nonetheless, although some individuals give up public religious practices and beliefs, they remain interested in spiritual issues and engage in private religious activities, such as prayer or meditation. In 2008, 38% of the Belgian respondents believed in the existence of a spirit or a life force other than a personal God, 47% of the respondents described themselves as "very or somehow spiritual," and 22% had their own way of "connecting with the divine" (European Values Study, 1999/2000, 2010). This evolution has been observed in other Western European countries (Houtman & Aupers, 2007; Pollack, 2008) and in the United States (Pew Research Center, 2012). Apparently, some individuals reject practices and beliefs of an organized religion (i.e., Christianity) but remain interested in religious/spiritual issues and create their own system of beliefs and behaviors, related to an individually defined "sacred." This increasing interest in the personal "spiritual" and the tendency to "pick and choose" among religious/spiritual traditions, beliefs, and practices has been described as "believing without belonging" (Davie, 1990, 2005), "fuzzy fidelity" (Voas, 2009), "*religion à la carte*" (Abts et al., 2011), or "rise of the nones" (Pew Research Center, 2012). The latter refers to the increasing numbers of U.S. respondents who "answer a survey question about their religion by saying they have no religion, no particular religion, no religious preference, or the like" (Pew Research Center, 2012, p. 7).

Such changes in religious practices and beliefs observed in the Belgian population have called for new theoretical frameworks and the development of new psychological instruments able to reflect their complexity and diversity. To address this issue, in the mid-1990s, Hutsebaut (1996, 1997) constructed the Post-Critical Belief Scale (PCBS), a multidimensional instrument measuring religious attitudes defined as "paradigms of religious belief structure" (Hutsebaut,

1996, p. 56). The PCBS is based on Wulff's (1991, 1997) categorization of psychological and individual approaches to religion. Wulff's comprehensive framework (presented next), encompassing both religious belief and disbelief, seemed particularly well suited as a theoretical model guiding the development of a scale measuring attitudes toward religion in a secularized Christian context.

THE WULFF MODEL

In his seminal book *Psychology of Religion: Classic and Contemporary Views*, Wulff (1991, 1997) presented a summary schema to classify both psychological approaches toward and individuals' views on religion. On the basis of two dimensions (i.e., Inclusion vs. Exclusion of Transcendence and Literal vs. Symbolic), Wulff discerned four religious attitudes: Literal Affirmation, Literal Disaffirmation, Symbolic Affirmation, and Symbolic Disaffirmation. Although the dimension of Inclusion versus Exclusion of Transcendence specifies the degree to which an individual believes in the existence of a transcendental reality, the Literal versus Symbolic dimension reflects the way in which religious messages are interpreted.

The attitude of Literal Affirmation applies to individuals who define themselves as religious and interpret religious contents in a rigid, closed-minded, and dogmatic fashion. These individuals uncritically and strictly adopt religious contents as taught by a particular religious tradition. In its extreme, it is represented by religious fundamentalism or orthodoxy. Literal Disaffirmation represents an utter rejection of religion on the basis of strict and literal arguments (e.g., the lack of scientific evidence for the miraculous stories in the Bible). The belief in the transcendent is replaced with belief in science and the rational principles of knowledge. Like a literal believer, the literal disbeliever tends to be rigid, low in ability to adapt, and less capable to evaluate ideas (Wulff, 1991, 1997).

The other two concepts, Symbolic Affirmation and Symbolic Disaffirmation, are derived from the hermeneutic ideas presented in the works of the French philosopher Paul Ricoeur (1978). According to Ricoeur, development of faith is based on the reconciliation of two opposing but potentially complementary processes: reduction and restoration. Reduction involves a deciphering of religious messages in order to find the deep spiritual messages hidden beyond the religious mythology. In a secularized cultural context this also requires confrontation with the critique of religion delivered by the "masters of suspicion" (i.e., Nietzsche, Freud, and Marx). Restoration implies a return to religious faith, now on a deeper, symbolic level of interpretation ("a second *naiveté*"). The attitude of Reductive Interpretation (or Symbolic Disaffirmation) is based on a rejection of the existence of a transcendental realm. However, it goes beyond the simple literal disbelief and sees religion and its rituals as an expression of human needs and "restores to religion some fundamental, positive meaning" (Wulff, 1991, p. 634). Individuals representing this attitude consider religiosity as one way of giving meaning to life among many others. They respect other people's choice to be religious but do not need religiosity themselves to find meaning in life. Finally, Restorative Interpretation (or Symbolic Affirmation) represents a belief in religious ideas and objects based upon a search for "symbolic meaning that resides within and ultimately points beyond these objects" (Wulff, 1991, p. 634). This attitude can also be described as "postcritical belief" as it tries to go beyond the criticism of religion. Individuals with this attitude define themselves as religious persons yet process

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religious contents in a more symbolic, open, and tolerant fashion. They assume that several interpretations of religious contents are possible and try to find one that they find personally meaningful.

In Hutsebaut's (1996) opinion, Wulff's model seemed particularly appropriate as a theoretical basis for the development of a scale that measures religious attitudes in the secularized context of Belgium (Flanders). The two dimensions encompass both the contents and the way of processing information in religious and nonreligious worldviews, thus providing more psychological insight into a variety of ways in which individuals approach religion. For example, initial Flemish studies of religious attitudes using the PCBS drafted a profile of believers and nonbelievers approaching religion in a symbolic way. According to Hutsebaut (1996), a symbolic believer

> is basically aware, after reflection that his way of thinking about religious belief is one possibility besides other possibilities. He has a fundamental symbolic interpretation of the Bible stories and is fundamentally aware of the quest dimension in belief. . . . He has no fear for the complexity of the questions. (p. 57)

A symbolic nonbeliever

> is not a real unbeliever. He will score low on religious items, but religion is still present in his life, perhaps on a rather negative or ambivalent mode, but present. His religiosity is colored by the critique formulated by the masters of suspicion. This means that the subject is in search of objective certainty, he is anxious about uncertainty in belief, he wants to be objectively sure about belief just as he can be sure in objective positive science. (Hutsebaut, 1996, p. 58)

PRESENT STUDY

The PCBS has been used extensively in studies in psychology of religion in Belgium (Flanders) and other countries (for an overview, see Duriez, Dezutter, Neyrinck, & Hutsebaut, 2007). It has also been applied in studies looking at Catholic school identity in Flanders and Australia (Bouwens, 2012; Pollefeyt & Bouwens, 2010). Over the last decade, authors of the current study have collected a large database of PCSB scores on item level ($N = 28{,}562$; for more details, see the Method section) in different age groups and have gathered considerable experience in using the scale. Over the years, however, we have observed that some of the Flemish participants, especially adolescents, have problems understanding and accepting scale items relating to specific Catholic religious teachings, such as the Biblical stories (e.g., Items 2 and 25). Also, a recent study assessing Catholic school identity in Australia reported problems with the understanding of scale items by young Australian participants (Bouwens, 2012; Pollefeyt & Bouwens, 2010). Consequently, a research question has arisen whether the meaning or interpretation of the PCBS items has changed over time in different data sets.

The aim of the current study is to analyze the scale structure based on data collected (a) from subjects in different age groups (i.e., adolescents, young adults, and adults), and (b) in different periods (data collected before 2002, 2002–2005, and 2006–2010). The choice of the age groups and the data collection cut-off points was guided by both practical and theoretical considerations. The practical aspect relates to three effective periods of data collection, that

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is, before 2002, 2002–2005, 2005–2010 (Dezutter & Hutsebaut, 2010; Duriez, Fontaine, & Hutsebaut, 2000; Duriez, Soenens, & Hutsebaut, 2005; Fontaine, Duriez, Luyten, & Hutsebaut, 2003; Pollefeyt & Bouwens, 2010). The theoretical considerations refer to the aforementioned changes in the religious culture in Western Europe (see the Introduction section). These sociological and historical evolutions clearly involved also changes in educational practices in general, and in religious education in particular (Duriez, Soenens, Neyrinck, & Vansteenkiste, 2009; Henckens et al., 2011).

In this study we used a recently developed component analysis method called "Clusterwise SCA-ECP," a specific variant of simultaneous component analysis (De Roover, Ceulemans, & Timmerman, 2012; De Roover, Ceulemans, Timmerman, Vansteelandt, et al., 2012; De Roover, Ceulemans, Timmerman, Nezlek, & Onghena, 2013). This method seemed particularly appropriate for the study aims, as it provides insight into the between-sample structural similarities and differences. It provides best clustering of the samples according to the underlying component structure, and thus allows to explore which samples differ in their underlying structure and how.

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METHOD

Participants

In this study we use 16 different samples ($N = 28{,}562$) that were collected in Flanders (Belgium) using two versions of the 33-item PCBS: a 7-point scale, from 1 (*strongly disagree*) to 7 (*strongly agree*), and a 6-point scale, from 1 (*strongly disagree*) to 6 (*strongly agree*). In these samples we distinguished three age groups: adolescents (12–17 years), young adults (18–24 years), and adults (25–85 years), and three data collection cut-off points for the analysis (i.e., <2002, 2002–2005, and 2006–2010). Unfortunately, older data used in the original studies of Hutsebaut (1996, 1997) are not available because of a simple but very sad fact: They were lost in a fatal computer crash in the late 1990s. We can refer to the results reported in the published studies, but we cannot reanalyze the original data.

The data that were gathered have a hierarchical structure, with subjects nested in 16 samples differing with respect to age, year of administration of the scale, and scale version. Such hierarchically structured data can also be referred to as "multiblock data," as each sample corresponds to a "data block." The complete data set, discarding subjects with missing values, contains the 16 data blocks (or "samples") enlisted in Table 1.

Analysis

To answer the research question, a component analysis method called "Clusterwise SCA-ECP" was used (De Roover, Ceulemans, & Timmerman, 2012; De Roover, Ceulemans, Timmerman, Vansteelandt, et al., 2012; De Roover et al., 2013). Like in standard principal component analysis, the underlying structure of the PCBS was unveiled by reducing the items to a lower number of constructed variables called "components" that summarize the observed scores on the items. The general idea of the Clusterwise SCA-ECP approach is that some samples can be modeled using the same set of components, whereas for other samples, a different set of

TABLE 1
List of the Different Samples That Make Up the Data Set and Their Characteristics

Time	*Age*	*Version*	*Subjects (N)*	*Remarks*	*Partition*[a]
<2002	12–17 years	7-point scale	111		1
<2002	18–24 years	7-point scale	590		1
<2002	25–85 years	7-point scale	571		1
<2002	>85 years	7-point scale	1	removed	—
2002–2005	12–17 years	7-point scale	301		2
2002–2005	18–24 years	7-point scale	1,082		2
2002–2005	25–85 years	7-point scale	1,068		2
2006–2010	12–17 years	7-point scale	131		2
2006–2010	12–17 years	6-point scale	7,312	random sample of 3,000	2
2006–2010	18–24 years	7-point scale	1,201		2
2006–2010	18–24 years	6-point scale	12,625	random sample of 3,000	2
2006–2010	25–85 years	7-point scale	866		2
2006–2010	25–85 years	6-point scale	2,678		2
2006–2010	>85 years	7-point scale	1	removed	—
2006–2010	>85 years	6-point scale	5	removed	—
2006–2010	<12 years	6-point scale	19	removed	—

[a]This column indicates the cluster to which the sample is assigned in the Clusterwise Simultaneous Component Analysis-Equal Cross-Product model with three clusters and three components per cluster.

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components is more appropriate. Therefore, Clusterwise SCA-ECP simultaneously assigns the samples to a number of clusters and performs a specific variant of simultaneous component analysis (i.e., SCA-ECP; Timmerman & Kiers, 2003) within each cluster, which yields a separate component structure for each cluster with the number of components allowed to differ across clusters. Based on this approach, it is expected that samples with a similar structure will emerge in the same cluster, whereas samples with a different structure will be assigned to a different cluster. To perform a Clusterwise SCA-ECP analysis, one may follow the steps discussed by De Roover, Ceulemans, and Timmerman (2012) and use their software program called MultiBlock Component Analysis.[1]

In a first step, it should be checked whether the data are appropriate for analysis. Specifically, it should be examined whether each data block (or sample) contains a reasonable number of subjects: Each data block should contain more subjects than the number of components to be estimated, and the number of subjects should be sufficiently large to allow generalizability of the results. Also the variance of each variable should be checked, as variables with larger variances will dominate the analysis. Therefore, as often done in standard principal component analysis, the variables are standardized (i.e., means are set to zero and variances are set to one) per data block. This implies that differences in mean levels across the samples (e.g., the samples containing ages 25 to 85 have higher mean levels on most Literal Affirmation items) are removed and, thus, that the analyses will focus entirely on (differences in) the correlation structure of the items.

[1]The software can be downloaded from http://ppw.kuleuven.be/okp/software/MBCA/. Note that up to now it imposes the same number of components for all clusters.

In the next step, Clusterwise SCA-ECP analyses with different numbers of clusters and components are conducted and model selection is performed, that is, the most appropriate number of clusters (K) and the most appropriate number of components (Q^k) for each cluster is determined based on theoretical knowledge about the data or formal model selection techniques. In the MultiBlock Component Analysis software, a formal model selection technique is implemented that is based on scree plots (i.e., plots of the percentage of explained variance in function of the number of components and clusters) and that determines for which model the increase in fit with additional clusters or components levels off. The last step involves inspecting and interpreting the selected model(s) through examination of the clustering of the samples and/or the component loadings for the different clusters. As in regular principal component analysis (PCA), standard rotational procedures (e.g., varimax; Kaiser, 1958) can be applied per cluster to make the structure of the component loadings easier to interpret.

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RESULTS

Data Characteristics

Following the recommendations just listed, we removed from the analysis data blocks containing subjects younger than 12 and older than 85 (see Table 1). As the data size of the remaining 12 data blocks (from now on called "samples"; 28,536 subjects × 33 items) exceeded the memory limit of the analysis software, a random selection of 3,000 subjects from each of the two largest samples was used (see Table 1).[2] Consequently, the analyses were performed on a total of 14,599 subjects nested in 12 samples. The data for the selected subjects were standardized, resulting in each PCBS item having a mean of zero and a variance of 1 in every sample.

Model Selection

The factor analyses and Multidimensional Scaling (MDS) performed to-date to investigate the structure of the PCBS gave divergent results: three predominantly unipolar dimensions versus two bipolar dimensions. As just described, the PCBS aimed to capture the four approaches to religion proposed by Wulff (1991, 1997) in his two-dimensional model; however, factor analysis followed by varimax rotation revealed three unipolar factors (Desimpelaere, Sulas, Duriez, & Hutsebaut, 1999; Hutsebaut, 1996, 1997). The first factor referred to items showing the literal acceptance of Christian beliefs, the second factor encompassed items designed to measure literal disaffirmation, and the third factor referred to items reflecting both the meaningfulness of Christian religion and its relativity. Nonetheless, subsequent psychometric studies using MDS supported the interpretation of the scale items in terms of two bipolar dimensions (i.e., Inclusion vs. Exclusion of Transcendence and Literal vs. Symbolic) and the respective four quadrants (i.e., Literal Affirmation, Literal Disaffirmation, Symbolic Affirmation, and Symbolic Disaffirmation; Duriez et al., 2000). MDS pointed out the presence of

[2]The reported results were replicated using four other random selections of 3,000 subjects.

two different aspects capturing a symbolic approach to religion: Symbolic Affirmation and Symbolic Disaffirmation.

In the current study a data-driven analysis was performed without employing any a priori hypothesis about the (number of) underlying dimensions. Moreover, the most appropriate number of clusters was unknown. Therefore, Clusterwise SCA-ECP analyses with the number of clusters varying from one to five and the number of cluster-specific components varying from one to six were performed.

Figure 1 displays the percentage of explained variance of the different Clusterwise SCA-ECP solutions against the number of components for each number of clusters. We inspected the gain in explained variance with additional clusters over the different numbers of components. The increase in model fit from one (i.e., identical component structure for all samples) to more clusters was rather small, and on this basis it could be concluded that one cluster is enough to summarize the data. However, the small differences in fit can be due to the fact that the structural differences between clusters concern only a few of the items, which is interesting for the research question at hand. Solutions with four or more clusters seem less adequate because the observed increase in the percentage of explained variance when adding a second or third cluster was larger than when adding a fourth or a fifth cluster. To corroborate this conclusion, we evaluated the stability of the associated clustering. To this end, we applied a split-half procedure similar to the one described by Kiers and Van Mechelen

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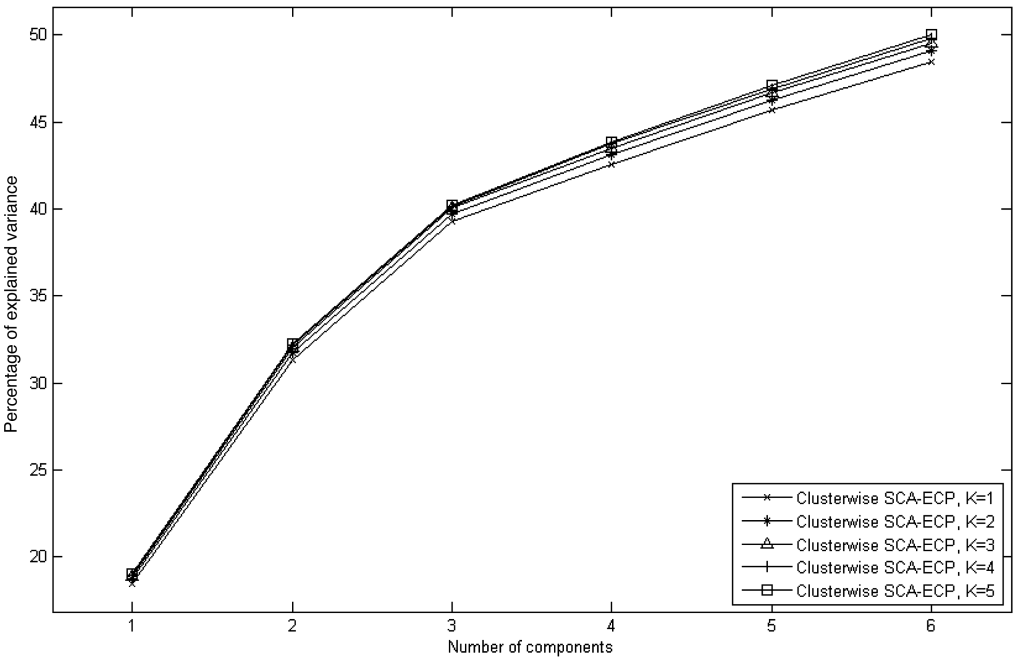


FIGURE 1 Percentage of explained variance for Clusterwise Simultaneous Component Analysis-Equal Cross-Product (SCA-ECP) solutions for the Post-Critical Belief Scale data, with the number of components varying from one to six and the number of clusters varying from one to five.

TABLE 2
Mean Adjusted Rand Index of the Clusterings of the Split-Half Solutions to the Corresponding Full-Data Clustering, per Number of Clusters and Components

	1 Comp	*2 Comp*	*3 Comp*	*4 Comp*	*5 Comp*	*6 Comp*
2 clusters	.55	.93	**1.00**	.74	.82	.63
3 clusters	.45	.95	**.99**	.71	.84	.63
4 clusters	.50	.87	.78	.75	.66	.63
5 clusters	.51	.70	.76	.71	.68	.50

Note. Comp = components.
Bolded values = indicated solutions based on Adjusted Rand Index values.

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(2001). Specifically, each sample was randomly divided into two equally sized subsets, resulting in two new data sets. On these data sets, Clusterwise SCA-ECP analyses with two to five clusters and one to six components per cluster were performed. This procedure was repeated 20 times. The resulting clusterings were compared to the corresponding clustering (i.e., with the same number of clusters and components) of the full data set by means of the Adjusted Rand Index (ARI; Hubert & Arabie, 1985). The ARI equals 1 when two clusterings can be considered identical and zero when the overlap between both is at chance level. The mean ARI value therefore indicates how stable and reliable the corresponding clustering for the full data is. From Table 2, which displays all these mean ARI values, we conclude that the solutions with two or three clusters and three components seem indicated, which confirms the preceding results. When comparing the solutions with three and two clusters, it was concluded that the third cluster was hardly informative (i.e., its structure was almost identical to that of the second cluster) and that retaining two clusters was the best choice in terms of interpretability.

Regarding the number of components, the stability results indicate that three components should be used. A similar conclusion can be drawn upon inspection of the scree plot in Figure 1, which reveals that the increase in fit with additional components levels off after three components.[3] Although the number of components can in principle differ between both clusters, the results of a split-half procedure per cluster (focusing on the component loadings instead of the clustering) indicate that using three components yields the most stable solution for each cluster.

Interpretation of the Selected Models

The model with one cluster and three components, indicating the PCBS structure over all samples, was investigated. The left part of Table 3 presents the corresponding loadings rotated according to the normalized varimax criterion (Kaiser, 1958). The first component can be

[3]The four-component solution was also inspected, but the obtained component structure did not correspond to the four dimensions of the PCBS. Furthermore, a multigroup structural equation model (Jöreskog, 1971; Kline, 2004; Rosseel, 2012; Sörbom, 1974) imposing the four PCBS dimensions as factors did not yield a good fit to the data (comparative fit index [CFI] = .78).

TABLE 3
Normalized Varimax Rotated Loadings for the SCA-ECP Model With Three Components and the Clusterwise SCA-ECP Model With Two Clusters and Three Components of the PCBS Data

				Clusterwise SCA-ECP					
	SCA-ECP			*Cluster 1: <2002*			*Cluster 2: >2002*		
Item	*LA*	*LD*	*S*	*LA*	*LD*	*S*	*LA*	*LD*	*S*
Item 3	**.56**	−.27	.11	**.51**	.34	.01	**.56**	−.26	.12
Item 4	**.62**	−.13	−.05	**.60**	.17	−.16	**.62**	−.13	−.04
Item 7	**.57**	−.16	−.03	**.50**	.22	−.22	**.58**	−.16	−.02
Item 11	**.63**	.02	.00	**.56**	−.04	.02	**.63**	.02	.00
Item 14	**.68**	−.27	.07	**.59**	.37	.03	**.68**	−.26	.08
Item 17	**.63**	.14	−.14	**.57**	−.15	−.13	**.63**	.14	−.14
Item 21	**.61**	.19	−.09	**.54**	−.23	−.06	**.61**	.18	−.10
Item 25	***.58***	*.10*	*−.17*	*.07*	*.14*	***.46***	***.63***	*.11*	*−.23*
Item 5	−.01	**.67**	−.01	.06	**−.71**	.05	−.01	**.67**	−.02
Item 8	.02	**.62**	.03	.02	**−.61**	.12	.02	**.62**	.02
Item 18	−.20	**.56**	.18	−.01	**−.55**	.20	−.21	**.56**	.17
Item 20	−.05	**.66**	−.14	.03	**−.66**	−.04	−.05	**.65**	−.15
Item 22	−.02	**.70**	−.13	.06	**−.67**	−.04	−.02	**.70**	−.14
Item 27	−.14	**.70**	.07	.00	**−.73**	.05	−.15	**.70**	.06
Item 29	.21	**.51**	.06	.16	**−.53**	.12	.21	**.51**	.05
Item 30	.20	**.60**	−.15	.09	**−.56**	.02	.21	**.59**	−.17
Item 32	−.13	**.59**	.14	−.13	**−.48**	.18	−.13	**.60**	.13
Item 1	.17	**−.40**	**.50**	.19	**.49**	.33	.17	−.39	**.51**
Item 2	*.10*	*−.04*	***.43***	***.48***	*−.17*	*−.27*	*.07*	*−.05*	***.49***
Item 6	.05	−.18	**.48**	.16	**.44**	.26	.05	−.16	**.49**
Item 10	.14	**−.52**	**.57**	.21	**.68**	.34	.13	**−.50**	**.59**
Item 12	.35	**−.40**	.38	.22	**.41**	.29	.36	**−.40**	.39
Item 16	.10	−.27	**.45**	.04	.31	**.46**	.10	−.26	**.45**
Item 26	.13	**−.52**	**.55**	.11	**.67**	.34	.14	**−.50**	**.57**
Item 33	.32	**−.52**	.32	.27	**.66**	.17	.32	**−.51**	.34
Item 9	−.11	.16	**.55**	−.10	−.04	**.57**	−.11	.18	**.55**
Item 13	−.20	.23	**.45**	−.01	−.02	**.41**	−.21	.26	**.45**
Item 15	−.10	.10	**.57**	−.04	−.04	**.55**	−.10	.11	**.58**
Item 19	−.22	.16	**.54**	−.18	.01	**.54**	−.22	.18	**.54**
Item 23	−.29	.08	**.46**	−.26	−.05	**.46**	−.28	.08	**.46**
Item 24	−.39	.05	**.52**	−.30	−.04	**.51**	−.39	.06	**.52**
Item 28	−.04	−.07	**.45**	−.06	−.03	.39	−.03	−.07	**.46**
Item 31	−.22	.36	.31	−.20	−.33	.35	−.22	.37	.31

Note. SCA-ECP = Simultaneous Component Analysis-Equal Cross-Product, PCBS = Post-Critical Belief Scale, LA = Literal Affirmation, LD = Literal Disaffirmation, SA = Symbolic Affirmation, SD = Symbolic Disaffirmation, S = Symbolic Attitude.

Loadings equal to or greater than ± .40 are in bold.

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labeled "Literal Affirmation" with all items measuring this attitude loading high on this component. The second component can be labeled "Literal Disaffirmation" due to the strong positive loadings of the Literal Disaffirmation items. In addition, most of the Symbolic Affirmation items have a strong negative loading on this component, indicating a negative relation between Literal Disaffirmation and Symbolic Affirmation. The third component is labeled "Symbolic," as most of the items related to Symbolic Affirmation and Symbolic Disaffirmation have high positive loadings on this component. The latter indicates a positive relation between Symbolic Affirmation and Symbolic Disaffirmation. Specifically, to some extent, a high score on Symbolic Affirmation items seems to co-occur with a high score on Symbolic Disaffirmation items and vice versa.

To explore possible differences between samples, the selected Clusterwise SCA-ECP model was examined.[4] The clustering of the samples (presented in Table 1) was inspected to see which samples are brought together in the clusters. Cluster 1 (labeled "<2002") contains the samples collected before 2002. Cluster 2 (labeled ">2002") consists of all samples collected after 2002 (i.e., 2002–2005 and 2006–2010). Based on the clustering, it can be concluded that the structural differences in the PCBS are mostly determined by the year of administration of the scale and not by the age of the subjects.

The normalized varimax rotated loadings for the two clusters of the selected Clusterwise SCA-ECP model can be found in Table 3. Comparing these loadings across clusters, the general loading pattern is very similar and strongly resembles the structure found when using only one cluster. Thus, the three components can again be interpreted as "Literal Affirmation," "Literal Disaffirmation," and "Symbolic Attitude." As stated previously, the difference between the clusters pertains to a few items only. Specifically, Items 2 and 25 (Table 3, in italics) both have a high loading on Literal Affirmation in one cluster and on Symbolic Attitude in the other. Indeed, when these two items are omitted, the Tucker congruence coefficients (see Tucker, 1951) between the corresponding cluster-specific components are all higher than .95, indicating that they can be considered identical (Lorenzo-Seva & ten Berge, 2006). Note that when Items 2 and 25 are included, the congruence coefficients amount to .91, .98, and .84, respectively.

In the appendix, we read that Items 2 and 25 are intended to measure Symbolic and Literal Affirmation, respectively, and that they both pertain to the interpretation of Bible stories. In Table 3 we see that Item 2 has a high loading on the Literal Affirmation component in Cluster 1 and a high loading on the Symbolic Attitude component in Cluster 2. Thus, for the test administrations before 2002, placing Bible stories in their historical context is positively correlated with most of the Literal Affirmation items (but not with Item 25), whereas after 2002 this item is more correlated with the other Symbolic Affirmation as well as with the Symbolic Disaffirmation items. Therefore, it seems that, over time, a shift occurred in what this item is

[4]We applied multigroup structural equation modeling (Jöreskog, 1971; Kline, 2004; Rosseel, 2012; Sörbom, 1974) to test for invariance of the loading structure over the samples (i.e., weak invariance; Meredith, 1993) when imposing an orthogonal three-factor structure that is based on the one-cluster (SCA-ECP) structure previously described (and printed in Table 3), that is, with a factor consisting of all Literal Affirmation items, one consisting of all Literal Disaffirmation items and one consisting of all Symbolic Affirmation and Disaffirmation items. This test could not confirm invariance of the loading structure, that is, $\Delta\chi^2 = 2530.874$ ($\Delta df = 363$, $\Delta p < .001$) and $\Delta\text{CFI} = 0.015$ (Chen, 2007; Cheung & Rensvold, 2002), which supports our choice to inspect the Clusterwise SCA-ECP model with two clusters.

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measuring. The opposite is true for Item 25, that is, it has a high loading on the Symbolic Attitude component in Cluster 1 and has shifted to the Literal Affirmation component in Cluster 2. This implies that, before 2002, people who agreed that Bible stories should be taken literally, also score high on Symbolic Affirmation as well as Symbolic Disaffirmation items (thus reflecting a general symbolic attitude). After 2002, mainly those who believe literally (i.e., score high on Literal Affirmation items) also interpret the Bible stories literally.

DISCUSSION

The aim of our study was to analyze the psychometric structure of the PCBS. In our earlier research we have observed that some of the participants in Flanders (and more recently also in Australia), especially younger people, had problems with the scale. They could not understand or accept some of the scale items, especially the items relating to specific Catholic religious teachings, such as Biblical stories. Consequently, a question has arisen whether over the last decade the meaning of the PCBS items has changed, and whether there would be differences between age groups in relation to the ability of the PCBS to measure the four religious attitudes proposed by Wulff and studied by Hutsebaut and his colleagues.

In our study we have used an innovative sample-based data-driven method of analysis, that is, Clusterwise SCA-ECP. Based on the explained variance of the different Clusterwise SCA-ECP solutions, we concluded that a one-cluster model with identical component structure for all 12 samples is sufficient to summarize the data. However, because small differences in model fit can occur because the structural differences between clusters concern only a few items, the one-cluster solution was compared to the two-cluster solution. In this way we obtained two important results: We have found three attitudes (components) measured by the PCBS (instead of four attitudes as suggested by the theoretical framework of Wulff's model), and the analysis showed that a shift occurred regarding the meaning of two PCBS items over time. These two points are elaborated next.

First, the one-cluster model (including all 12 data blocks or samples) yielded three components: Literal Affirmation, Literal Disaffirmation, and Symbolic Attitude. In other words, the distinction between literal belief and literal disbelief was found irrespective of the year of administration of the scale and of the age of the subjects. However, the Symbolic Affirmation and Symbolic Disaffirmation items do not measure the two respective attitudes described by Wulff and Hutsebaut; instead they measure an open symbolic attitude in relation to religious (dis-)belief, which we have called a "Symbolic Attitude." This generalized symbolic attitude might be related to the changes in the traditionally Christian religious landscape of Western Europe, including Belgium (Flanders; Boeve, 2006, 2008). In addition to progressing secularization and religious pluralization, new sociological phenomena related to individuation and detraditionalization of religious beliefs, such as "believing without belonging" (Davie, 1990, 2005) or creating one's own "*religion à la carte*" (Abts et al., 2011) have been observed. This symbolic attitude might capture the belief of individuals who follow (or do not follow) a certain religious tradition and are open and accepting of other religious or philosophical position, or alternatively, have become indifferent to them.

Of interest, the three PCBS attitudes (or components) present in both psychometric models in our study have been reported in the original studies by Hutsebaut (1996, 1997) and his

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colleagues (e.g., Desimpelaere et al., 1999). As previously described, the scale aimed to capture the four approaches to religion proposed by Wulff (1991, 1997); however, factor analysis followed by varimax rotation revealed only three unipolar factors (Desimpelaere et al., 1999; Hutsebaut, 1996, 1997). These factors referred to (a) the literal acceptance of Christian beliefs, (b) an attitude of literal disaffirmation, and (c) an attitude reflecting both the meaningfulness and the relativity of the Christian religion. Only in later studies, using another method of analysis (i.e., Multidimensional Scaling), the two bipolar dimensions of Inclusion versus Exclusion of Transcendence and Literal versus Symbolic, as well as the respective four quadrants (i.e., Literal Affirmation/Disaffirmation and Symbolic Affirmation/Disaffirmation), were reported (Duriez et al., 2000). The phenomenon of acquiescence, that is, an individual's tendency to endorse or reject the scale items irrespective of their content, can explain the discrepancy between the results obtained with factor analysis and MDS (Duriez et al., 2000; Fontaine et al., 2003). Apparently, acquiescence leads to an increase of positive and a suppression of negative inter-item correlations resulting in masking bipolarity in factor analysis (whereas MDS is only marginally affected by this phenomenon; Green, Goldman, & Salovey, 1993). In line with this explanation, further psychometric analyses were conducted using orthogonal Procrustes rotation, which led to a convergence of the results obtained with MDS and factor analysis (Duriez et al., 2000).

In addition, studies conducted outside Flanders, using adaptations of the PCBS in German (Duriez, Appel, & Hutsebaut, 2003), Hungarian (Kezdy, Martos, Boland, & Horvath-Szabo, 2011), and Polish (Zarzycka & Rydz, 2011), confirmed the two-dimensional structure of the scale and reported the four attitudes originally proposed by Wulff (1991, 1997). However, these studies followed the methodology proposed by Duriez et al. (2000) and Fontaine et al. (2003) previously described. Consequently, results of these studies are not comparable with the results of our analysis using a data-driven Clusterwise SCA-ECP. A replication of our analysis using data collected in other countries, for example, a still traditionally Catholic Poland, could show whether the generalized Symbolic Attitude can be found in a different socio-cultural context, or alternatively the distinction between Symbolic Affirmation and Disaffirmation could still be detected.

In summary, our study using a data-driven method, without employing any assumptions regarding the number of underlying dimensions, has shown three components (attitudes) comparable to the three unipolar factors reported in the earlier studies. It is possible that the symbolic attitude found in our study, and in the original studies of Hutsebaut, is the "third attitude" (besides Literal Affirmation and Literal Disaffirmation) reflecting an open and tolerant, or alternatively indifferent, approach to religious beliefs. As mentioned earlier, studies in the sociology of religion indicate the emergence of such attitude in the secularized, individualized and detraditionalized Western European societies (Boeve, 2006, 2008; Voas, 2009). On the other hand, it is possible that the original distinction between acceptance and rejection of religion (or belief and disbelief) on the symbolic level proposed by Wulff (1991, 1997) remains a fact, but it is not possible to measure these attitudes using the PCBS. There have been complaints regarding the comprehensibility of some of the scale items, and this might affect the quality of the collected data and interpretation of results.

Second, the two-cluster model provided more insight into subtle differences between the analyzed samples. The structure in both clusters was comparable to the structure obtained in the one-cluster solution, and the same three components (i.e., Literal Affirmation, Literal

Disaffirmation, and Symbolic Attitude) emerged in the earlier samples (<2002) and in the more recent samples (>2002). Again, no differences were found between the age groups. Of interest, the subtle differences between samples collected before and after 2002 were related only to a few PCBS items, in particular Items 2 and 25.

In the two-cluster model we found subtle differences between the samples collected before and after 2002. In particular, there were differences relating to Item 2 ("If you want to understand the meaning of the miracle stories from the Bible, you should always place them in their historical context") and Item 25 ("I think that Bible stories should be taken literally, as they are written"). These two items pertain to the interpretation of Bible stories and are intended to measure Symbolic and Literal Affirmation, respectively. However, over time, a shift occurred in what these items are measuring. Regarding Item 2, before 2002, people scoring high on the Literal Affirmation items also believed that Bible stories should be placed in their historical context which might indicate that even people who believe literally interpret these stories in a nuanced light. After 2002 this item seems to reflect a general symbolic attitude, which may be an attribute of both believers and nonbelievers. The opposite is true for Item 25, that is, before 2002, people who agreed that Bible stories should be taken literally also scored high on Symbolic Affirmation and Disaffirmation items, thus reflecting a general Symbolic Attitude. After 2002, mainly those who believe literally also interpret the Bible stories literally. An important thing to note is that how one interprets the Bible stories (i.e., literally, or in historical context) may be separated from whether one believes in them or not. Consequently, someone who takes the stories literally does not necessarily believe in them, and vice versa. Given the cross-sectional character of data used in the current study it is not possible to draw conclusions regarding the changes in religious attitudes and/or meaning of the scale items over time. Future longitudinal studies could provide information and insights regarding the stability or change in the interpretation of PCBS statements.

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STRENGTHS AND LIMITATIONS

The analyses were performed on a large sample, including individuals in different age groups, collected over 10 years. This allowed to us determine whether the structural differences in the PCBS could be due to the year of administration of the scale and/or to the age of the subjects. In this study a data-driven analysis was performed without employing any a priori hypothesis about the number of or content of the underlying dimensions or the most appropriate number of clusters. Even though Clusterwise SCA-ECP is a new and, hence, less known method, it certainly has its strengths. First, the clustering is an important added value when comparing it to related factor analytic approaches like, for instance, the widely used multigroup structural equation modeling (Jöreskog, 1971; Kline, 2004; Sörbom, 1974). More specifically, Clusterwise SCA-ECP makes it easy to gain insight into the between-sample structural differences and similarities because it automatically looks for the best clustering of the samples according to the underlying component structure. Thus, whenever an invariant factor structure cannot be confirmed in multigroup structural equation modeling (as was the case in the current article; see footnote 6), and it is infeasible or tedious to fit and compare separate factor or structural equation models for different samples, Clusterwise SCA-ECP provides an efficient solution to explore which samples differ in their underlying structure and how. Second, where other

component methods for modeling the underlying structure of multiblock data are either too generic to be insightful (fitting a separate principal component model to each sample) or too restrictive to capture structural differences (fitting one common SCA model for all samples), Clusterwise SCA-ECP is a very flexible method. On one hand, it encompasses the existing methods as special cases (i.e., taking as many clusters as there are samples boils down to separate PCAs and retaining only one cluster corresponds to SCA) and, on the other hand, it allows each intermediate solution (i.e., the number of clusters can take any value between one and the number of samples).

In spite of these strengths, the present study has several limitations. Only cross-sectional data collected using the PCBS have been used. We have no information regarding the sociodemographic profile of the study participants (except for their age), including their religious denomination, church attendance, or self-definition as a religious or a nonreligious person, which could help us to gain deeper insights into the results of our study. In addition, the age groups and the cut-off points for the time of data collection have been chosen based on the three periods of data collection and on the sociological and historical evolutions in the religious culture in Flanders. Nonetheless, they have been chosen arbitrarily by us instead of being hypothesis driven. Also, the data of each sample was standardized, thus removing the sample-specific mean levels of the items. This implies some information loss, as these differences may be substantively interesting and may be related to the differences in structure. The removal of the mean differences may explain why no differences were found between the different age groups. It would certainly be worthwhile to simultaneously evaluate mean level and structural differences between the samples in future research. Finally, as a weakness of Clusterwise SCA-ECP, or any component method, some might conjecture that the components are based on the total variance of the observed variables, without distinguishing between the common and unique variance of each variable (as is done in factor analysis; Lawley & Maxwell, 1962). Consequently, the resulting model might be affected by error variance. However, based on prior studies, it can be argued that error fitting mostly boils down to a slight overestimation of the loadings, without it affecting the interpretation of the components (see, e.g., Velicer, Peacock, & Jackson, 1982).

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CONCLUSIONS

Using an innovative sample-based data-driven method we have analyzed the psychometric structure of the PCBS to answer our question regarding possible changes in the meaning of the scale items in different age groups over time. We found the distinction between Literal Affirmation and Disaffirmation irrespectively of the year of administration of the scale and of the age of the subjects. However, the PCBS items related to Symbolic Affirmation and Symbolic Disaffirmation do not measure the attitudes proposed in the original model of Wulff (1991, 1997); instead they tap into an open symbolic attitude in relation to religious (dis-)belief. Of interest, we also found subtle differences between the earlier and the more recent samples in regards to two PCBS items that relate to the interpretation of Bible stories.

Our study has raised a number of issues that require further investigation. The major question is related to the finding that a number of PCBS items are measuring a generalized Symbolic Attitude instead of two attitudes: Symbolic Affirmation and Disaffirmation. Is our finding an

artefact related to problems with comprehensibility of (some of) the scale items, as reported by research participants in our earlier studies, or does it reflect the existence of a postcritical, open, and tolerant (or alternatively indifferent) approach to religion in a secularized country? Further studies, especially cross-cultural comparisons, should explore this point further. Moreover, the cross-sectional nature of our data limits the scope of our interpretation of the observed shift in the meaning of some of the PCBS items related to the interpretation of Biblical stories. Longitudinal studies looking at the stability of meaning of the PCBS items could help resolve this issue.

Our final conclusion relates to the future of the PCBS. Despite the success of the scale—its broad research application and numerous adaptations to other languages and cultures, the development of a scale measuring religious belief and disbelief, or in other words, a variety of religious and secular worldviews, in a pluralistic Western European context may be recommended. Undoubtedly, the model of Wulff (1991, 1997) remains a comprehensive and inspiring framework for classification of theoretical approaches and individual's attitudes toward religion. Nonetheless, in our opinion, the perspective of personal (religious or secular) orienting systems, which has been proposed as a new unifying framework for the study of psychology of religion and spirituality (Paloutzian & Park, 2013), could serve as theoretical model guiding the development of a new scale. This comprehensive framework acknowledges a variety of cognitive, motivational, and affective components comprising a personal meaning system (Dezutter & Corveleyn, 2013), and reflects the multidimensionality of religious attitudes (Saroglou, 2011).

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REFERENCES

Abts, K., Dobbelaere, K., & Voyé, L. (2011). *Nieuwe tijden, nieuwe mensen* [New times, new people]. Tielt, Belgium: Lannoo Campus.

Boeve, L. (2006). *God onderbreekt de geschiedenis. Theologie in tijden van ommekeer* [God interrupts history: Theology in a time of upheaval]. Kapellen, Belgium: Pelckmans.

Boeve, L. (2008). *Onderbroken traditie. Heeft het christelijk verhaal nog toekomst?* [Interrupting tradition. Does the Christian faith still have a future?]. Kapellen, Belgium: Pelckmans.

Bouwens, J. (2012). *Identity in diversity: Assessing and enhancing Catholic school identity* (Unpublished master's thesis). KU Leuven-Catholic University of Leuven, Leuven, Belgium.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464–504.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233–255.

Davie, G. (1990). Believing without belonging: Is this the future of religion in Britain? *Social Compass, 37*, 455–469.

Davie, G. (2005). *Believing without belonging: Just how secular is Europe?* Retrieved from http://www.pewforum.org/Politics-and-Elections/Believing-Without-Belonging-Just-How-Secular-Is-Europe.aspx

De Roover, K., Ceulemans, E., & Timmerman, M. E. (2012). How to perform multiblock component analysis in practice. *Behavior Research Methods, 44*, 41–56.

De Roover, K., Ceulemans, E., Timmerman, M. E., Nezlek, J. B., & Onghena, P. (2013). Modeling differences in the dimensionality of multiblock data by means of clusterwise simultaneous component analysis. *Psychometrika*, *78*, 648–668.

De Roover, K., Ceulemans, E., Timmerman, M. E., Vansteelandt, K., Stouten, J., & Onghena, P. (2012). Clusterwise simultaneous component analysis for the analysis of structural differences in multivariate multiblock data. *Psychological Methods, 17*, 100–119.

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Desimpelaere, P., Sulas, F., Duriez, B., & Hutsebaut, D. (1999). Psycho-epistemological styles and religious beliefs. *The International Journal for the Psychology of Religion, 9*, 125–137.

Dezutter, J., & Corveleyn, J. (2013). Meaning making: A crucial psychological process in the confrontation with a life stressor. In H. Westerink (Ed.), *Constructs of meaning and religious transformation* (pp. 167–184). Vienna, Austria: University Press.

Dezutter, J., & Hutsebaut, D. (2010). *Cognitive and affective aspects of religion in relation to mental health. An exploration in community and clinical samples*. Leuven, Belgium: KU Leuven–University of Leuven.

Duriez, B., Appel, C., & Hutsebaut, D. (2003). The German Post-Critical Belief scale: Internal and external validity. *Zeitschrift für Socialpsychologie, 34*, 219–226.

Duriez, B., Dezutter, J., Neyrinck, B., & Hutsebaut, D. (2007). An introduction to the Post-Critical Belief Scale: Internal structure and external relationships. *Psyke & Logos, 28*, 767–793.

Duriez, B., Fontaine, J. R. J., & Hutsebaut, D. (2000). A further elaboration of the Post-Critical Belief scale: Evidence for the existence of four different approaches to religion in Flanders-Belgium. *Psychologica Belgica, 40*, 153–181.

Duriez, B., Soenens, B., & Hutsebaut, D. (2005). Introducing the shortened Post-Critical Belief Scale. *Personality and Individual Differences, 38*, 851–857.

Duriez, B., Soenens, B., Neyrinck, B., & Vansteenkiste, M. (2009). Is religiosity related to better parenting? Disentangling religiosity from religious cognitive style. *Journal of Family Issues*, *30*, 1287–1307.

European Values Study. (1999/2000). *Release 2, May 2006* (ZA3811). Cologne, Germany: GESIS Data Archive.

European Values Study. (2010). *European Values Study 2008, 4th Wave, Integrated Dataset.* Cologne, Germany: GESIS Data Archive.

Fontaine, J. R. J., Duriez, B., Luyten, P., & Hutsebaut, D. (2003). The internal structure of the Post-Critical Belief scale. *Personality and Individual Differences*, *35*, 501–518.

Green, D. P., Goldman, S. L., & Salovey, P. (1993). Measurement error masks bipolarity in affect ratings. *Journal of Personality and Social Psychology, 64*, 1029–1041.

Henckens, R., Pollefeyt, D., Hutsebaut, D., Dillen, A., Maex, J., & De Boeck, E. (2011). *Geloof in kinderen?* [Religious faith of children?]. Leuven, Belgium: Uitgeevrij Peeters.

Houtman, D., & Aupers, S. (2007). The spiritual turn and the decline of tradition: The spread of post-Christian spirituality in 14 Western countries, 1981–2000. *Journal for the Scientific Study of Religion*, *46*, 305–320.

Hubert, L., & Arabie, P. (1985). Comparing partitions. *Journal of Classification*, *2*, 193–218.

Hutsebaut, D. (1996). Post-critical belief. A new approach to the religious attitude problem. *Journal of Empirical Theology, 9*, 48–66.

Hutsebaut, D. (1997). Identity statuses, ego-integration, God representation and religious cognitive styles. *Journal of Empirical Theology, 10*, 39–54.

Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36*, 409–426.

Kaiser, H. F. (1958). The varimax criterion for analytic rotation in factor analysis. *Psychometrika, 23*, 187–200.

Kezdy, A., Martos, T., Boland, V., & Horvath-Szabo, K. (2011). Religious doubts and mental health in adolescence and young adulthood: The association with religious attitudes. *Journal of Adolescence, 34*, 39–47.

Kiers, H. A. L., & Van Mechelen, I. (2001). Three-way component analysis: Principles and illustrative application. *Psychological Methods, 6*, 84–110.

Kline, R. B. (2004). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: Guilford.

Lawley, D. N., & Maxwell, A. E. (1962). Factor analysis as a statistical method. *The Statistician, 12*, 209–229.

Lorenzo-Seva, U., & ten Berge, J. M. F. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology, 2*, 57–64.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika, 58*, 525–543.

Paloutzian, R. F., & Park, C. L. (2013). Recent progress and core issues in the science of the psychology of religion and spirituality. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 3–46). New York, NY: Guilford.

Pew Research Center. (2012). *"Nones" on the rise: One-in-five adults have no religious affiliation*. Washington, DC: Pew Research Center.

Pollack, D. (2008). Religious change in Europe: Theoretical considerations and empirical findings. *Social Compass*, *55*, 168–186.

Pollefeyt, D., & Bouwens, J. (2010). Framing the identity of Catholic schools: Empirical methodology for quantitative research on the Catholic identity of an education institute. *International Studies in Catholic Education*, *2*, 193–211.

Ricoeur, P. (1978). The critique of religion. In C. Reagan & D. Stewart (Eds.), *The philosophy of Paul Ricoeur: An anthology of his work* (pp. 213–222). Boston, MA: Beacon Press.

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, *48*, 1–36.

Saroglou, V. (2011). Believing, bonding, behaving, and belonging: The Big Four religious dimensions and cultural variation. *Journal of Cross-Cultural Psychology, 42*, 1320–1340.

Sörbom, D. (1974). A general method for studying differences in factor means and factor structure between groups. *British Journal of Mathematical and Statistical Psychology, 27*, 229–239.

Timmerman, M. E., & Kiers, H. A. L. (2003). Four simultaneous component models of multivariate time series from more than one subject to model intraindividual and interindividual differences. *Psychometrika, 86*, 105–122.

Tucker, L. R. (1951). *A method for synthesis of factor analysis studies* (Personnel Research Section Report No. 984). Washington, DC: Department of the Army.

Velicer, W. F., Peacock, A. C., & Jackson, D. N. (1982). A comparison of component and factor patterns: A Monte Carlo approach. *Multivariate Behavioral Research, 17*, 371–388.

Voas, D. (2009). The rise and fall of fuzzy fidelity in Europe. *European Sociological Review, 25*, 155–168.

Wulff, D. M. (1991). *Psychology of religion: Classic and contemporary views.* New York, NY: Wiley.

Wulff, D. M. (1997). *Psychology of religion: Classic and contemporary views* (2nd ed.). New York, NY: Wiley.

Zarzycka, B., & Rydz, E. (2011). The selective relationship between religious dimensions and social desirability among Polish students. *Mental Health, Religion and Culture, 14*, 411–422.

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APPENDIX

TABLE A1
The 33-Item Post-Critical Belief Scale

No.	*Key*	*Item*
01.	SA	The Bible holds a deeper truth which can only be revealed by personal reflection.
02.	SA	If you want to understand the meaning of the miracle stories from the Bible, you should always place them in their historical context.
03.	LA	You can only live a meaningful life if you believe.
04.	LA	God had been defined for once and for all and therefore is immutable.
05.	LD	Faith is more of a dream which turns out to be an illusion when one is confronted with the harshness of life.
06.	SA	The Bible is a guide, full of signs in the search for God, and not a historical account.
07.	LA	Even though this goes against modern rationality, I believe Mary was truly a virgin when she gave birth to Jesus.
08.	LD	Too many people have been oppressed in the name of God in order to still be able to have faith.
09.	SD	Each statement about God is a result of the time in which it is made.
10.	SA	Despite the fact that the Bible was written in a completely different historical context from ours, it retains a basic message.
11.	LA	Only the major religious traditions guarantee admittance to God.
12.	SA	Because Jesus is mainly a guiding principle for me, my faith in him would not be affected if it would appear that he never actually existed as a historical individual.
13.	SD	Ultimately, religion means commitment without absolute guarantee.
14.	LA	Religion is the one thing that gives meaning to life in all its aspects.
15.	SD	The manner in which humans experience their relationship to God will always be colored by the times they live in.
16.	SA	The historical accuracy of the stories from the Bible is irrelevant for my faith in God.
17.	LA	Ultimately, there is only one correct answer to each religious question.
18.	LD	God is only a name for the inexplicable.
19.	SD	Official Church doctrine and other statements about the absolute will always remain relative because they are pronounced by human beings at a certain period of time.
20.	LD	The world of Bible stories is so far removed from us that it has little relevance.
21.	LA	Only a priest can give an answer to important religious questions.
22.	LD	A scientific understanding of human life and the world has made a religious understanding superfluous.
23.	SD	God grows together with the history of humanity and therefore is changeable.
24.	SD	I am well aware that my beliefs are only one possibility among so many others.
25.	LA	I think that Bible stories should be taken literally, as they are written.
26.	SA	Despite the high number of injustices Christianity has caused people, the original message of Christ is still valuable to me.
27.	LD	In the end, faith is nothing more than a safety net for human fears.
28.	SD	Secular and religious conceptions of the world give valuable answers to important questions about life.
29.	LD	In order to fully understand what religion is all about, you have to be an outsider.
30.	LD	Faith is an expression of a weak personality.
31.	SD	There is no absolute meaning in life, only giving directions, which is different for every one of us.
32.	LD	Religious faith often is an instrument for obtaining power, and that makes it suspect.
33.	SA	I still call myself a Christian, even though a lot of things that I cannot agree with have happened in the past in the name of Christianity.

Note. LA = Literal Affirmation, LD = Literal Disaffirmation, SA = Symbolic Affirmation, SD = Symbolic Disaffirmation.

Each item is preceded by a key that allows seeing which attitude this item was supposed to capture.

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