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THE INTERNAL STRUCTURE OF THE POLISH ADAPTATION OF THE POST-CRITICAL BELIEF SCALE

Hutsebaut and his colleagues (1996, 2000; Fontaine et al., 2003) constructed the Post-Critical Belief Scale (PCBS) in order to measure the two dimensions along which Wulff (1991) summarized the various possible approaches to religion: Exclusion vs. Inclusion of Transcendence and Literal vs. Symbolic Interpretation. In the present article, the internal structure of the Polish version of the scale is analyzed. The results obtained in ten Polish samples ($N = 1775$) suggest that the internal structure of the Polish version partially reflects the assumed theoretical structure of PCBS. Furthermore, the results of principal component analysis and reliability analysis are presented in the article.

Keywords: post-critical belief, religiosity, religious beliefs.

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INTRODUCTION

In the field of psychology of religion, many authors have researched the intensity of attitudes towards religion and their coherence with the normative system of beliefs contained in particular religions (see Prężyna, 1968; Hutsebaut, 1980). Cultural and social changes and increasing secularization in particular have revealed a large number of issues relating to religion that do not fit into the to-date research paradigms. Openness to the diversity of cultures, religions, and ethical systems are attributes of today's world. Syncretic tendencies, in which a wealth of various beliefs on faith and religion are sometimes lumped together, are characteristic of attitudes towards religion. In the modern world, an individual often cannot find justification, neither for others nor for himself or herself, regarding his or her religious beliefs (see Duriez, Fontaine, & Hutsebaut, 2000).

In the context of the existing diversity of attitudes towards religion, David M. Wulff (1991) developed a new and interesting perspective on religion – an analysis of religious cognitive styles. According to Wulff, there are four possible approaches to religion, which can be located in a two-dimensional space. The vertical axis of the space represents the Exclusion vs. Inclusion of Transcendence and the horizontal axis represents the Literal vs. Symbolic way of interpreting the content of beliefs. Dirk Hutsebaut (1996, 2000) together with his colleagues operationalized this model by means of the Post-Critical Belief Scale (PCBS).

The aim of this paper is to show the internal structure of the Polish adaptation of the Post-Critical Belief Scale. First attempts to adapt PCBS were made in 2003-2008 (see Bartczuk, Wiechetek, & Zarzycka, 2011). The initial structure of the Polish PCBS adaptation was determined with the use of multi-dimensional scaling (MDS). The research showed the necessity to reformulate one of the items in the scale. The item was corrected and further research was continued on the revised method (e.g., Zarzycka, 2012; Śliwak & Zarzycka, 2013; Zarzycka & Rydz, 2013). This paper contains a detailed structure analysis of the revised PCBS version based on the study of 10 samples of adolescences and adults. Wulff's theoretical model is presented first, followed by an outline of PCBS, constructed by Hutsebaut, and then the structure analysis of the Polish adaptation and its psychometric properties are shown.

Wulff's Framework

According to Wulff (1991), potential attitudes to religion can be located in a two-dimensional space (see Fig. 1). The vertical axis indicates the degree to

which religious objects are granted space in transcendent reality (Inclusion of Transcendence) or to which they are limited to the immanent processes of reality (Exclusion of Transcendence). This axis informs about the degree to which people affirm God's real existence or another transcendental reality; that is, the axis differentiates religious from irreligious people. The horizontal axis – Literal vs. Symbolic Interpretation – specifies the way of understanding the contents of beliefs. An individual's position on this dimension indicates whether he or she interprets religious texts, expressions, and religious symbols literally or symbolically (metaphorically). In the matrix of the above mentioned dimensions, reflecting the possible styles of outlook on religion, four quadrants are distinguished (Wulff, 1991):

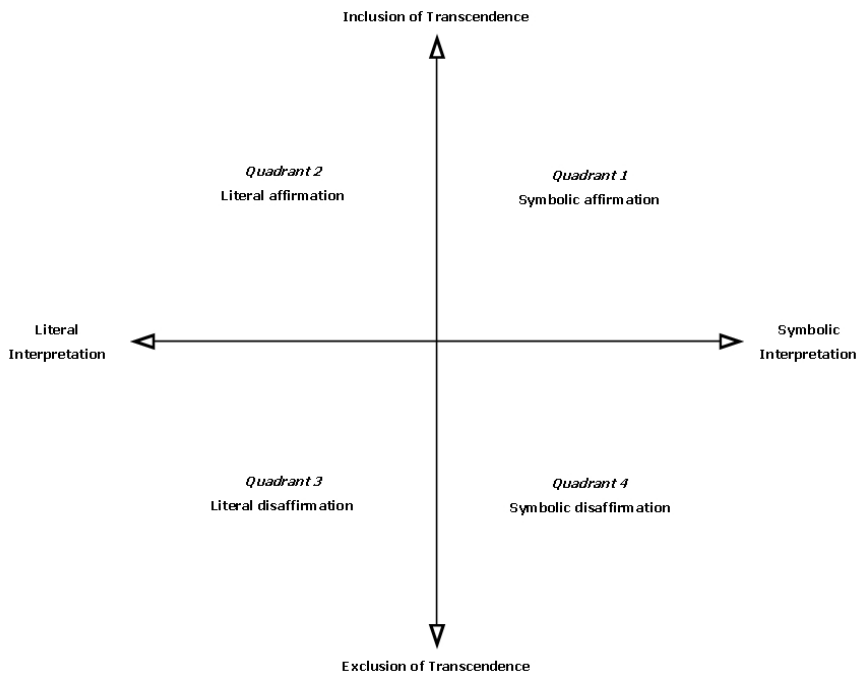


Figure 1. Wulff's model of approaches towards religion (1991, p. 631).

Literal Affirmation (quadrant 2) represents a position which affirms the reality of the religious object and in which religion is interpreted literally. This type of attitude is illustrated by religious fundamentalism. Wulff's analyses (1991) of previous studies suggests that those representing Literal Affirmation style score higher on measures of prejudice and lower on measures of cognitive development and adaptive abilities (see Duriez et al., 2000).

Literal Disaffirmation (quadrant 3) represents a standpoint in which religious statements are understood literally but they are dismissed in reference to truth. Most frequently, this style is connected with the acceptance of only those statements which are based on results from life sciences – on findings meeting their criteria. To date, attitudes from this quadrant have been characterized as anti-religious orientation or atheism. People holding such a viewpoint are considered to be less dogmatic and more rational but also less impartial and less able to assess the views of others, not to mention being rather rigid and less capable of adaptation (Wulff, 1991; Duriez et al., 2000).

Symbolic Disaffirmation (quadrant 4) represents a perspective in which the religious object is not considered to be real but a privileged position is granted to the hidden and symbolic understanding of religious myth and ritual. Symbolic Disaffirmation is similar to Literal Disaffirmation in that it rejects the existence of transcendental counterparts of religious language and practices. This attitude is reflected in such psychological constructs as, for example, the study of individual and reflexive faith (J. Fowler), the quest orientation (D. Batson), or the Enlightenment Disbelief Scale (F. Barron). The correlation between the two dimensions suggest that the religiosity of those in quadrant 4 can be described in terms of "shedding illusions." Such people are complex, socially sensitive, and inquiring rather unprejudiced and original, but they are also full of fears. For many people this is an interim phase (Wulff, 1991; Duriez et al., 2000).

Symbolic Affirmation (quadrant 1) stands for a position in which it is believed that transcendental reality exists; however, this perspective avoids literally equating transcendental reality with religious views and objects. What is sought instead is the symbolic meaning which those objects carry but which eventually points outside them. An illustration of this attitude, which has been skipped in previous research, is J. Fowler's concept of conjunctive faith (Wulff, 1991).

In his interpretation of the last two types of approaches to the contents of beliefs, Wulff refers to the ideas of a French philosopher – Paul Ricoeur (2004). Taking social and cultural changes as a background, Ricoeur posed a question: how can people call themselves religious in the times of criticism and atheism? Summarizing attempts to address this issue, he came to the conclusion that, for the contents of beliefs to restore their meaning, a new interpretation is needed

– the so-called restorative interpretation. In the process of restorative interpretation, religious symbols are cleared of consequences of idolatry and illusion and their meaning is reconstructed so that they can become objects of understanding and faith again. Ricoeur called the process of restorative interpretation “Second Naiveté.”

The Post-Critical Belief Scale

Inspired by Wulff’s ideas (1991), Hutsebaut (1996) developed the PCBS. Items in the questionnaire were to capture attitudes towards religion identified by Wulff in the Christian context. An initial analysis of the data collected from several studies carried out on adolescences, students, and adults using principal component analysis (PCA) showed that the scale structure consists of three factors (Hutsebaut, 1996, 1997a, 1997b; Desimpelaere, Sulas, Duriez, & Hutsebaut, 1999). Those three dimensions were interpreted as: (1) Orthodoxy – corresponding to Literal Affirmation; (2) External Critique – consistent with Literal Disaffirmation, and (3) Historical Relativism, comprised of what Wulff, in his model, called Symbolic Disaffirmation and Symbolic Affirmation. Therefore, the results only partially confirmed that the empirical structure was consistent with the theoretical model. In subsequent studies, the number of items was increased and a new method – MDS – was employed (Duriez et al., 2000). Consequently, a two-dimensional space emerged with dimensions corresponding to the theoretical framework: the first dimension was consistent with Exclusion vs. Inclusion of Transcendence and the second with Literal vs. Symbolic Interpretation. Items characteristic for Orthodoxy turned out to be located in the upper left quadrant and items characteristic to External Critique were located in lower left quadrant. Most of the items which belonged to Historical Relativism in previous studies fell into the upper right quadrant and some of them emerged in the lower right quadrant. A thorough analysis of the content of items revealed that items located in the upper right quadrant expressed approval for Christian religious beliefs, while those situated in the lower right quadrant represented a relativist stance, which confirmed the validity of the revised scale. Items from the lower right quadrant were located in the Exclusion of Transcendence space, indicating them as being measures of Symbolic Disaffirmation. Thus, possibly, it should be understood as a relativistic attitude to religion rather than its explicit rejection (Fontaine, Duriez, Luyten, & Hutsebaut, 2003). The upper right quadrant was labelled Second Naiveté, referring to Ricoeur, while the lower right

one was called Relativism (see Fig. 2). The above-mentioned MDS results were also supported by Flemish scholars – initially on 16 samples ($N = 4648$) and then on further 9 ($N = 2657$) (Duriez et al., 2000).

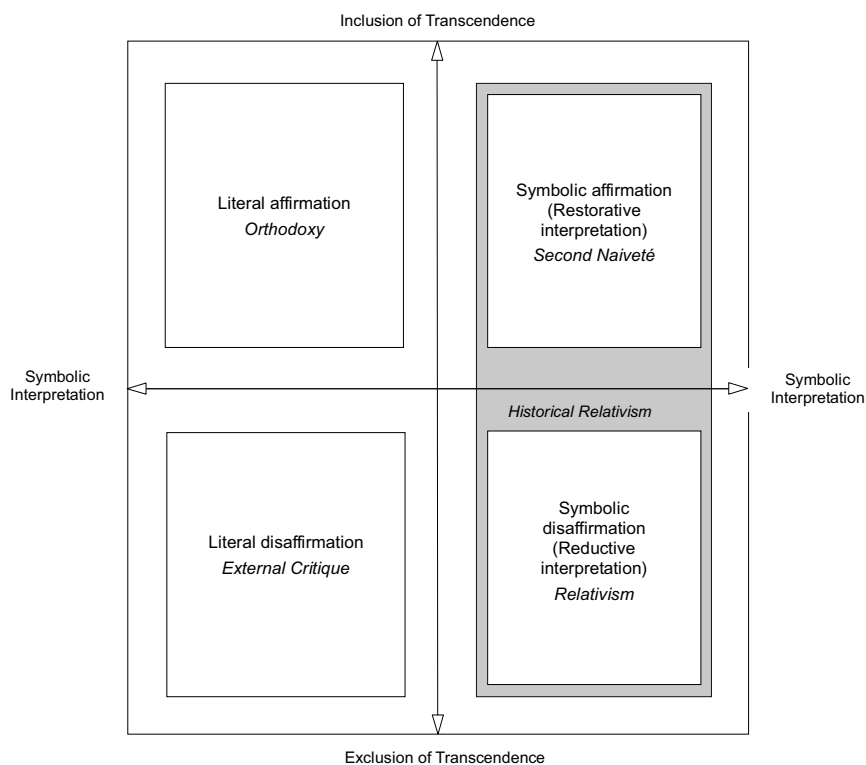


Figure 2. Integration of PCBS subscales in Wulff's theoretical model (Fontaine et al., 2003, p. 502). The grey area denotes Historical Relativism scale from the three-dimensional version of PCBS.

MDS demonstrated that PCBS is a valid operationalization of Wulff's model. Items characteristic of Orthodoxy refer to the Literal Affirmation, while External Critique items refer to the Literal Disaffirmation. Both the Relativism and the Second Naiveté imply symbolic approach to religion; however, they differ with respect to the affirmation of the existence of religious objects (Fontaine et al., 2003).

The final version of PCBS consists of 33 items. This version served as a starting point for a large number of scale adaptations into other languages (e.g., Duriez, Appel, & Hutsebaut, 2003; Muñoz-García, & Saroglou, 2008; Martos, Kézdy, Robu, Urbán, & Horváth-Szabó, 2009; Moghanloo, Aguilar-Vafaie, & Shahraray, 2010), including the presented Polish variant (Bartczuk, Wiechetek, & Zarzycka, 2011). Currently, PCBS is a widely used method in psychology of religion studies across the world, including Poland (literature review points to the following works: Duriez, Dezutter, Neyrinck, & Hutsebaut, 2007; Śliwak & Zarzycka, 2010, 2011; Bartczuk, Wiechetek, & Zarzycka, 2011).

The Polish Adaptation of PCBS

The adaptation of PCBS has been developed since 2000, when its three-factor version was translated in Polish (Szymoń, 2005; Śliwak, 2005; Śliwak & Zarzycka, 2012). In 2011, results of the initial studies on the adaptation of the four-factor PCBS version were published, based on research carried out in 2003-2008 (Bartczuk, Wiechetek, & Zarzycka, 2011). The research included MDS administered to four student samples ($N = 948$), analysis of the psychometric properties of test items, estimation of reliability, and initial analysis of theoretical validity. The above-mentioned analyses (Bartczuk, Wiechetek, & Zarzycka, 2011) implied that one of the Second Naiveté items was characterized by weak psychometric properties. The item was then revised, in accordance with the suggestions put forward during the translation process. Research was continued on various samples of adolescent and adult Poles with the revised version.

This paper presents a detailed analysis of the internal structure of the revised PCBS version, carried out using MDS and Procrustes analysis as applied to the data from 10 samples. Identifying the structure of the Polish PCBS version is the most important element of adapting this method, such identification being a measure of the method's theoretical validity. Furthermore, this paper gives an account of the results of the reliability analysis of PCBS subscales as well as of the PCA – which can be used to obtain individual scores for Exclusion vs. Inclusion of Transcendence and Literal vs. Symbolic Interpretation dimensions.

METHODOLOGY

Sample

The results presented in this paper were obtained from 10 studies administered between 2009 and 2012. The research included: five samples of students, four samples of adults who were not students, and a sample of secondary-school students, adding up to a total of 1775 respondents. Table 1 presents the size of each sample as well as their age and sex structure. The adolescent sample consists of final year secondary school students, who participated voluntarily in the study, carried out during a lesson. The student sample consisted of social sciences students (Psychology and Pedagogy) attending various universities in Lublin (samples 3, 4, and 7), Lublin and Szczecin (sample 1), and Warsaw and Krakow (sample 10). Participation in the study was voluntary (sample 1 and 10) or obligatory, since the students received credit points in return (sample 3, 4, and 7). Adult respondents were recruited by students, who asked their acquaintances to fill in the questionnaire. Variables important for Wulff's theory, such denominational affiliation and self-assessed religiosity, were controlled in all samples.

Table 1.
Sex and Age of the Sample

Group	Group description	N	Sex		Age		
			Ratio of women	M	SD	Min.	Max.
1	Students	141	.60	23.8	6.17	19	47
2	Adolescents	102	.52	17.2	0.67	16	18
3	Students	205	.72	20.5	2.06	18	32
4	Students	222	.52	22.1	2.73	18	30
5	Adults	200	.50	43.0	5.07	33	50
6	Adults	210	.54	60.8	6.22	51	79
7	Students	203	.85	21.4	1.96	18	31
8	Adults	195	.68	36.6	13.89	18	72
9	Adult	148	.52	26.1	10.27	19	68
10	Students	149	.57	21.9	4.08	18	48
Total		1775	.61	30.5	15.01	16	79

Questionnaires with more than three missing data items were excluded from the analysis – there were 13 such sets (7.3%). In cases with less than three missing data items, questionnaires were imputed using a procedure based on canonical variables (Harrell, 2010). In total, 330 missing data items were filled in, which constituted 5.7% of all the results.

Method

The revised version of the Polish PCBS adaptation was distributed to respondents. It contained 33 items and respondents marked their responses on a 7-point Likert scale. Each item was given a label according to the identification developed by Fontaine et al. (2003, p. 515). Orthodoxy items had an O prefix, External Critique items had E, for Relativism there was R, and Second Naiveté was marked as S.

Procedures of Internal Structure Analysis

As in the case of the original version, internal structure of the Polish PCBS adaptation was analyzed using MDS and PCA (see Fontaine et al., 2003).

MDS is used to establish a structure within a set of objects (in this case, of PCBS items) based on distances between them. Each object is represented by a point in an n -dimensional space so that the distances between the points represent empirical measures of similarity (or dissimilarity) between the objects (Biela, 1992; Wieczorkowska & Król, 2005). For the object relations that emerge dimensional and regional interpretation can be provided. In dimensional interpretation analysis is performed on space dimensions, and in regional interpretation the boundaries of the space containing objects of a specific type are sought. The use of MDS enables researchers to analyze PCBS structure on the basis of data from various samples, simultaneously avoiding the influence of idiosyncrasies in responses. The method also facilitates cross-country comparison of results. However, it does not provide a measurement model estimating individual differences in the observed dimensions. This option is offered by the principle component analysis.

As in the case of the original version, results from items corrected for acquiescence were included in the PCA (Fontaine et al., 2003). Such an alteration was needed due to the fact that all the PCBS items were positive and the responses were given on a 7 point Likert-type scale, expressing respondents' consent. According to the theoretical model, Literal Affirmation and Symbolic Disaffirmation excluded each other, as was also the case with Literal Dis-

affirmation and Symbolic Affirmation. Thus, high scores on the Orthodoxy subscale should be accompanied by low scores on the Relativism subscale while high scores on the External Critique subscale should go with low scores on Second Naiveté. Supposing a respondent's answers were in line with the theoretical framework, his or her average result for all the four subscales should equal the neutral point in the response format (4), which is not always the case.

The reason for this discrepancy lies, among other things, in the tendency to acquiesce with all the items, regardless of their content. One of the methods to avoid such *post factum* errors connected with the idiosyncratic use of the response format by respondents is correction by means of results ipsatization. For PCBS, the procedure is as follows: (1) the average result for four subscales (treated as a respondent's neutral point) is quantified for each person and then (2) this figure is subtracted from the raw results for each of the 33 PCBS items for this person (Fontaine et al., 2003). Following this procedure, the average result for the four subscales together for each respondent equals 0. A neutral point common for all the subjects is quantified and deviations from it for each subscale can be compared across respondents.

To address the issue of whether the observed dimensions of configuration and their components can be interpreted in terms of Exclusion vs. Inclusion of Transcendence and Literal vs. Symbolic Interpretation, Procrustes analysis was used (Schonemann, 1966; Gower & Dijksterhuis, 2004). In this method of comparing shapes, objects are transformed in such a way so as to be optimally adjusted to other objects while keeping their initial shape (the so-called Procrustes distance between objects is minimized). The congruence of configurations was tested by means of Tucker's ϕ , the congruence coefficient (Lorenzo-Seva & ten Berge, 2006).

Analyses were conducted using the R statistical package (R Core Team, 2012).

RESULTS

Multidimensional Scaling

Using MDS, the authors confirmed the compliance of dimensional analysis and regional analysis with Wulff's model (Fontaine et al., 2003; see Figure 3 [BEL]). The answer to the question of whether the relation between items in the Polish version of PCBS can be interpreted in terms of Wulff's two dimensions

was sought by means of non-metric MDS. This method was also used for the original scale. Average Euclidean distances were used as a measure of dissimilarity between standardized items across the sample (Duriez, Fontaine, & Hutsebaut, 2000). Then, we constructed and thoroughly analyzed average distance matrices for 10 groups. As a result, we obtained many configurations from one-dimensional to six-dimensional. The next step was the comparison and analysis of the fit of each dimension with the corresponding Belgian research measures (see Table 2).

Table 2.

Kruskal Stress and Percentage of Variance Accounted for (R²) Across Specific Solutions in MDS

Number of dimensions in model	Belgian data		Polish data	
	STRESS	R ²	STRESS	R ²
1	.31	.70	.20	.82
2	.12	.92	.11	.90
3	.08	.94	.07	.94
4	.06	.96	.05	.95
5	.05	.98	.04	.96
6	.05	.98	.03	.97

The analysis of Polish and Belgian data points to the similarity between the samples, which clearly confirms the relevance of a two-dimensional representation. The two-dimensional configuration of items in the Polish PCBS (see Figure 3 [POL]) indicates the opposition between Orthodoxy and Relativism as well as between Second Naiveté and External Critique. The dimensional interpretation of the obtained result is in accordance with the theoretical model. Regional interpretation, however, leads to a divergence from the theoretical model: External Critique and Relativism items coincide. This problem does not appear when the theoretically correct configuration is introduced: External Critique items are at the left side of Relativism items. Likewise, some Orthodoxy and Second Naiveté items overlap.

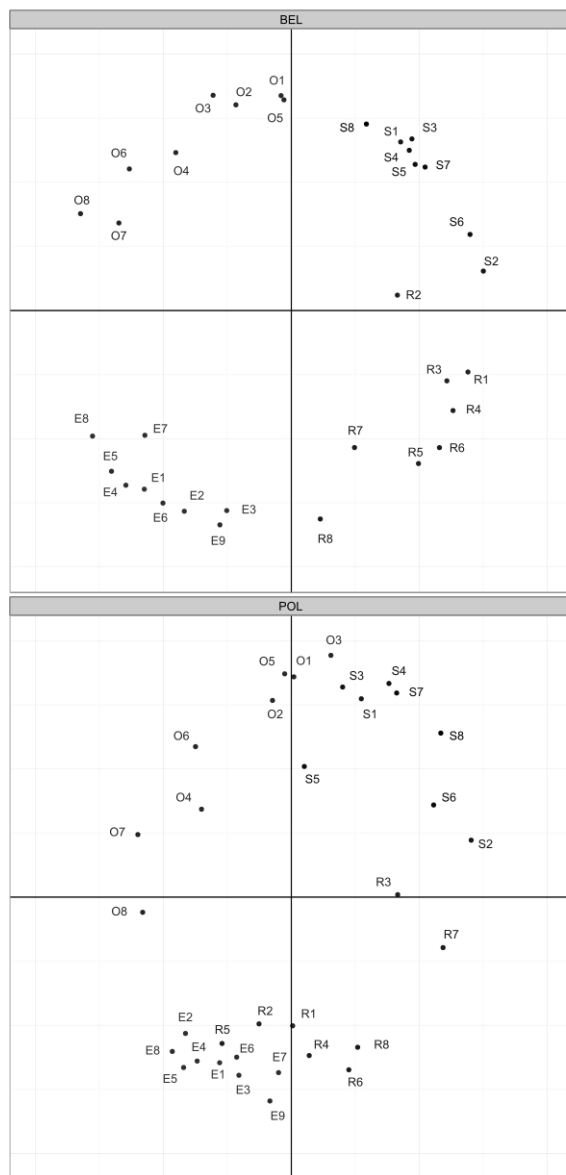


Figure 3. The results of MDS of PCBS items, two-dimensional model; BEL – configuration of the Belgian sample (16 groups) (Fontaine et al., 2003, p. 511); POL – configuration of the Polish sample (10 groups).

The obtained empirical configuration was orthogonally rotated towards a theoretical pattern. Orthodoxy items and Second Naiveté items in this theoretical configuration are situated at the positive end of the Inclusion vs. Exclusion of Transcendence dimension, while External Critique and Relativism items are at the negative end of the dimension. Orthodoxy items and External Critique items are situated at the negative end of the Literal Interpretation vs. Symbolic Interpretation dimension, whereas Relativism items and Second Naiveté items are at the positive end (Table 3 shows the coordinates of the theoretical configuration [columns A₁ and A₂] and the average configuration after Procrustes rotation [columns D₁ and D₂]). A statistical significance test for Procrustes analysis, based on 999 permutations, indicates a similarity between configurations ($r = .83$; $p < .001$). Tucker's ϕ congruence is $.92$ ($p < .001$) for the Exclusion vs. Inclusion of Transcendence dimension, and $.74$ ($p < .001$) for Literal vs. Symbolic Interpretation.

The authors of Belgian research obtained the following values of congruence, respectively: $.93$ and $.90$ (Fontaine et al., 2003, p. 511). Generally, the value of $.85$ is interpreted as indicating high degree factor similarity (Lorenzo-Seva & ten Berge, 2006). Thus, even though according to dimensional interpretation the structure of the configuration reflects the theoretical model, congruence coefficient analysis points to substantial model congruence only within the first dimension but not within the second one.

The identification of the cause of dissimilarity was based on the analysis of residuals, which are the measures of dissimilarity between each point of rotated empirical and theoretical configuration. The residuals were divided into two axes (vertical and horizontal, see Table 3, Columns e₁ and e₂). 25% of the highest residuals were indicated in Table 3 (columns e₁ and e₂, bold type). The majority of these residuals were included in the horizontal axis (which represents the Literal vs. Symbolic Interpretation dimension). These were four (out of eight) Orthodoxy items (O1, O2, O3, O5), two (out of eight) Second Naiveté items (S3 and S5), two (out of nine) External Critique items (E7 and E9), and five (out of eight) Relativism items (R1, R2, R4, R5, R6). It is fairly visible that all of these items from the residual plot are placed close to the vertical axis at its both ends, positive and negative. This configuration indicates that these items are too far (in this model) from the ends of the axis representing the Literal vs. Symbolic Interpretation dimension. This specifically relates to Relativism. All the PCBS items are more sensitive to the evaluation of the acceptance of the content of beliefs than to the evaluation of the mode of its cognitive processing.

Table 3.

Items From the Polish Version of PCBS, Theoretical Configuration (A1, A2), Coordinates of the Average Two-Dimensional Configuration (D1, D2), Residuals After Procrustes Rotation (e1, e2), and Average Factor Loadings (PC1, PC2) for Inclusion vs. Exclusion of Transcendence and Literal vs. Symbolic Interpretation

Item	A1	A2	D1	D2	e1	e2	PC1	PC2
E1	-1	-1	-1.14	-1.13	0.08	0.52	-.561	-.298
E2	-1	-1	-1.30	-0.85	0.11	0.30	-.432	-.393
E3	-1	-1	-1.30	-0.55	0.16	0.64	-.543	-.165
E4	-1	-1	-1.11	-1.26	0.07	0.37	-.513	-.352
E5	-1	-1	-1.01	-1.36	0.11	0.29	-.489	-.426
E6	-1	-1	-1.24	-1.00	0.04	0.62	-.551	-.230
E7	-1	-1	-0.76	-1.12	0.14	0.89	-.548	.027
E8	-1	-1	-0.76	-1.49	0.01	0.21	-.454	-.464
E9	-1	-1	-1.40	-0.60	0.32	0.83	-.585	.007
O1	1	-1	1.62	-0.12	0.38	0.93	.725	-.067
O2	1	-1	1.56	-0.44	0.22	0.85	.636	-.096
O3	1	-1	1.63	-0.60	0.50	1.22	.770	.156
O4	1	-1	1.23	-0.87	0.47	0.40	.337	-.403
O5	1	-1	1.59	-0.10	0.37	0.99	.782	-.073
O6	1	-1	1.12	-1.20	0.08	0.36	.436	-.298
O7	1	-1	0.74	-1.28	0.63	0.00	.239	-.501
O8	1	-1	0.81	-1.55	1.13	0.03	.029	-.536
R1	-1	1	-0.35	1.17	0.15	1.02	-.427	.028
R2	-1	1	0.20	0.68	0.17	1.24	-.400	-.059
R3	-1	1	-0.41	1.02	0.99	0.35	.045	.365
R4	-1	1	-0.62	1.06	0.03	0.92	-.523	.200
R5	-1	1	-0.99	0.81	0.04	1.47	-.430	-.124
R6	-1	1	-0.88	0.96	0.12	0.66	-.482	.307
R7	-1	1	-0.87	0.36	0.65	0.07	-.081	.505
R8	-1	1	-1.37	0.11	0.02	0.61	-.465	.350
S1	1	1	1.28	0.72	0.23	0.59	.568	.313
S2	1	1	0.36	1.29	0.67	0.11	.180	.264
S3	1	1	1.30	0.80	0.30	0.70	.608	.293
S4	1	1	1.22	0.78	0.32	0.41	.616	.480
S5	1	1	1.12	0.82	0.20	0.95	.362	.095
S6	1	1	0.62	1.20	0.45	0.13	.218	.210
S7	1	1	1.10	0.89	0.26	0.36	.565	.491
S8	1	1	1.41	0.48	0.01	0.08	.367	.394

The evaluation of the stability of the obtained average two-dimensional configuration in each of the samples was performed with MDS followed by the rotation of a sample-specific solution towards the average solution (see Table 4). A two-dimensional representation had a Kuskal Stress of .14 (the same as in Belgian data) and the ratio of explained variance was of .87 (.88 in the Belgian version). The value of congruence varied from .97 to .99 in the Inclusion vs. Exclusion of Transcendence dimension (median: .98; in Belgian research – .95) and from .72 to .95 for Literal vs. Symbolic interpretation (median: .85; in Belgian research – .94). These results indicate the stability of the Inclusion vs. Exclusion of Transcendence dimension across the samples. The obtained value of the ϕ coefficient in the Literal vs. Symbolic Interpretation dimension was too low in three groups (3, 5, and 7), which means that the arrangement of items in this dimension diverged from the arrangement that was obtained in the average configuration.

Table 4.

Kruskal Stress (STRESS) and Proportion of Variance Accounted for by the Two-Dimensional Representation in the Sample in MDS (R^2), Tucker's ϕ Congruence Coefficients of Rotated Group Configuration Towards the Average Configuration (ϕ_{D1} , ϕ_{D2}), Tucker's ϕ Congruence Coefficients of Principal Components Scores in the Groups After Procrustes Rotation Towards the Average Configuration (ϕ_{PC1} , ϕ_{PC2})

Group	STRESS	R^2	ϕ_{D1}	ϕ_{D2}	ϕ_{PC1}	ϕ_{PC2}
1	.15	.86	.97	.85	.98	.94
2	.15	.86	.99	.85	.99	.92
3	.17	.84	.97	.69	.98	.88
4	.15	.86	.99	.96	.99	.97
5	.13	.88	.99	.72	.99	.91
6	.14	.87	.98	.90	.99	.93
7	.14	.87	.98	.75	.99	.97
8	.12	.88	.98	.90	.97	.94
9	.12	.88	.99	.95	.99	.97
10	.13	.88	.98	.95	.98	.95
median	.14	.87	.98	.88	.99	.94

Principal Component Analysis

PCA was employed in order to obtain the measurement model for the scale's dimensions. As has already been stated in the paragraph devoted to the procedures of analyses, the computations were performed on the weighted-mean-corrected subject scores. A correlation matrix between the items was constructed for each of the samples. After Fisher z -transformation we averaged the matrices. Cattell's graphic scree test (1966) pointed to a two-componential solution (the first six eigenvalues: 8.41, 2.83, 1.27, 1.21, 1.16, and 1.07). This solution accounted for 34% of the total variance in each sample (compared to approximately 35% in the original version). The average two-componential structure was then orthogonally rotated towards the theoretical structure (PC1 and PC2 columns in Table 3 show the rotated solutions). Tucker's ϕ of .92 for Inclusion vs. Exclusion of Transcendence indicated good congruence and .71 for Literal vs. Symbolic interpretation indicated low congruence.

The evaluation of stability in the groups was analogical to the evaluation of configuration stability in MDS. The values of congruence for both dimensions are presented in Table 4 (columns ϕ_{PC1} and ϕ_{PC2}). Tucker's ϕ ranged from .97 to .99 for Inclusion vs. Exclusion of Transcendence (median: .99; in Belgian research – .96) and for from .88 to .97 Literal vs. Symbolic Interpretation (median: .94; in Belgian research – .96). These results confirm the stability of the two-componential structure in the samples, which means that the obtained measurement model is stable.

Rotated results of the PCA can be treated as a basis for the calculation of individual scores in the Inclusion vs. Exclusion of Transcendence and the Literal vs. Symbolic Interpretation dimensions. In accordance with the original (e.g., Duriez, 2003; Duriez, 2004; Neyrinck, Vansteenkiste, Lens, Duriez, & Hutsebaut, 2006), the procedure comprised the following steps: (1) calculation of weighted-mean-corrected subjects scores in the sample; (2) conducting PCA in the sample ($k = 2$); (3) Procrustes orthogonal rotation of the unrotated matrix of factor loadings obtained in the sample towards the rotated solution; (4) confirmation of the equivalence of the obtained solution with an average solution; (5) calculation of factor scores on the basis of the obtained rotated matrix of factor loadings.

Internal Consistency

In order to measure PCBS consistency, we computed Cronbach's α coefficient in each sample. The values of the reliability coefficient are presented in Table 5.

Table 5.
The Reliability Coefficient (α) Across the Sample

Group	Orthodoxy	External Critique	Relativism	Second Naiveté
1	.76	.85	.65	.79
2	.72	.87	.72	.65
3	.62	.80	.63	.53
4	.80	.87	.67	.74
5	.74	.84	.74	.68
6	.77	.85	.72	.70
7	.83	.87	.66	.75
8	.71	.83	.78	.67
9	.78	.88	.78	.73
10	.65	.88	.70	.73
median	.75	.86	.71	.71

External Naiveté items obtained the highest values of reliability coefficient α (from .84 to .88). When it comes to other scales, the value of the coefficient across the groups ranged from .62 to .83 for Orthodoxy; from .63 to .78 for Relativism, and from .53 to .79 for Second Naiveté. These values are treated as satisfactory.

Independently of the work on the internal structure of PCBS, research was conducted in order to establish the way the method functions in the context of different psychological variables. Drawing on the correlations with various methods, the research confirmed the method's construct validity. Convergent validity was established by Bartczuk, Wiechetek, and Zarzycka (2011) on a group of 914 students by correlation of PCBS results with other religion-associated questionnaires: Intensity and Centrality of the Religious Attitude (W. Prężyna), Religious Crisis Scale (W. Prężyna), Relationship to God Scale (D. Hutsebaut), and Huber's Centrality of Religiosity Scale (see Table 6).

Orthodoxy and Second Naiveté are positively correlated with the measures of Positive Relations with God, Centrality of Religious Attitude, and Intensity of

Religious Attitude and negatively with the negative dimensions of religious relations. Relativism and External Critique correlated negatively with Centrality of Religious Attitude, Intensity of Religious Attitude, and Positive Relations with God and positively with Religious Crisis and Negative Emotions Toward God. The obtained correlation coefficients, though statistically significant, were either medium or low. This means that the content scope of the constructs measured with PCBS and the measures of traditional religiosity overlap only partially. This is because PCBS measures the way of perceiving religion, not its intensity, importance, or quality. Moreover, in a different study, Zarzycka (2012) tested the relation between post-critical beliefs and emotions toward God. Orthodoxy correlated positively with Positive Emotions, Fear, and Sense of Guilt; Second Naiveté correlated positively with Positive Emotions and negatively with Negative Emotions Toward God; External Critique correlated positively with Anger Toward God and negatively with Sense of Guilt and Positive Emotions. Relativism correlated positively with Anger Toward God and negatively with Positive Emotions Toward God, Fear, and Sense of Guilt.

Table 6.
Relations Between the Subscales of the Polish Version of PCBS and Religious Variables

	Orthodoxy	Second Naiveté	Relativism	External Critique
Centrality*	+	+	-	-
Intensity	+	+	-	-
Crisis			+	+
Positive Relations with God	+	+	-	-
Negative Relations with God	-	-	+	+
Positive Emotions Toward God	+	+	-	-
Fear of God	+	-	-	
Sense of Guilt Toward God	+	-	-	-
Anger Toward God		-	+	+

* The pattern of correlations between Intensity and Centrality of Religious Attitude Scales (Prężyna), C-15 (Huber) and PCBS subscales was the same.

The results of different research indicate that religiosity dimensions measured by PCBS are consistent with Wulff's theory (1991) and correlate with other psychological variables. Inclusion of Transcendence (Orthodoxy and Second Naiveté) correlated positively with the Sense of Coherence (Zarzycka, & Rydz, 2009), Benevolence, Tradition, Conformity, and Security (Śliwak, & Zarzycka, 2013) and negatively with Anxiety (Bartczuk et al., 2009). Styles including Exclusion of Transcendence (External Critique and Relativism) were positively related to Anxiety (Bartczuk et al., 2009). External Critique correlated positively with Hedonism and Power and Negatively with Benevolence, Tradition, Conformity (Śliwak and Zarzycka, 2013), and the Sense of Coherence (Zarzycka and Rydz, 2009). Relativism correlated positively with Self-direction and negatively with Tradition and Benevolence (Śliwak & Zarzycka, 2013). All of the quoted results can be interpreted as confirmation of PCBS construct validity.

Table 7.

Correlation of PCBS Subscales With Psychosocial Variables

	Orthodoxy	Second Naiveté	Relativism	External Critique
Sense of coherence	+	+		
Benevolence	+	+	-	-
Tradition	+	+	-	-
Conformity	+	+		-
Security	+	+		
Hedonism				+
Power				+
Self-direction			+	
Anxiety	-	-	+	+

During adaptation research (Bartczuk, Wiechetek, & Zarzycka, 2011), we aimed at investigating the correlation between PCBS and Social Desirability tested with the Questionnaire of Social Desirability (KAS) designed by Drwal and Wilczyńska. The correlation between PCBS and KAS was statistically significant, but it was very low ($|r| < .15$). Thus, we can assume that PCBS is not prone to intentional or unintentional distortion.

CONCLUSION

The above-mentioned data from the research on the internal structure of the Polish PCBS revealed both its weak and strong points. The answer to the question to what extent the method is accurate when it comes to the measurement of religious attitudes described by Wulff (1991) is still debatable. The conducted research admittedly confirmed the two-dimensional structure of the Polish version of PCBS and pointed to the relevance of the link between the obtained empirical structure and the principles of Wulff's theory, but the degree of this relevance is not fully satisfying. Empirical data satisfactorily reflects the Inclusion vs. Exclusion of Transcendence dimension, whereas the Symbolic vs. Literal Interpretation dimension is reflected to an unsatisfactory degree. The items that, according to the theoretical model, should be strongly loaded with the symbolic or literal way of processing the religious content factor, do not reveal such a property. Strong similarity between some Relativism, External Critique, Second Naiveté, and Orthodoxy items is also connected with low diversity between these scales. This result indicates that the belief-disbelief continuum is diverse in Poland, while the degree to which Poles distinguish between forms of belief or disbelief is lower. What are the hypothetical explanations for this situation? Since PCBS items serve to operationalize the theoretical construct (which has been confirmed in various European countries [Duriez, Appel, & Hutsebaut, 2003; Muñoz-García, & Saroglou, 2008; Martos, Kézdy, Robu, Urbán, & Horváth-Szabó, 2009; Moghanloo, Aguilar-Vafai, & Shahraray, 2010]) and faithfully translated (using back translation procedure [Bartczuk, Wiechetek, & Zarzycka, 2011]), the underlying reason for the obtained dissimilarities lies in the specific perception of religion in Polish people, which is connected with two problems. Firstly, the research on the representative Polish sample indicates that religiosity in Polish people is strongly affected by the ideological dimension and public cult (Zarzycka, 2009), which are considered direct social indicators of religiosity. On the other hand, Polish religiosity is characterized by relatively low results in the dimensions of intellectuality, experience, personal prayer, and dimensions connected with personal activity. Such an approach to religion may facilitate placing oneself on the belief-disbelief continuum, which does not apply to the semantic domain. Secondly, the obtained result may be a reflection of different secularization processes in Western and Central-Eastern Europe. Moreover, in this particular perception of religiosity, factors such as sex-associated social schemes may be of considerable significance. An interesting finding is that the coefficient of internal consistency in the Symbolic vs. Literal Interpretation

dimension was lower in the groups where the ratio of women was higher. The foregoing remarks are suggestions for further research rather than explanations of results obtained in our study. At the present state of research, it is difficult to propose an unambiguous explanation. An important reservation that arose in the course of the study is that while interpreting the answers in the Polish version of PCBS one should bear in mind that the scale is more accurate in Inclusion vs. Exclusion of Transcendence than in Symbolic vs. Literal Interpretation. Thus, while interpreting the second dimension results, caution should be exercised.

Despite a few imperfections, it seems that the Polish adaptation of the method measuring the styles of religious cognition, which has an established position in psychological research worldwide, is highly valuable and well-founded. What is more, the analysis of internal consistency of PCBS confirmed the satisfying psychometric properties of the scale. Similarly, the quoted results indicate the usefulness of the method in the realm of religion-associated research, including the context of sociocultural alterations.

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