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ORIGINAL ARTICLE

Preliminary assessment of the psychometric properties of the Polish version of the Questionnaire to Assess Affective and Cognitive Empathy (QAACE) in Children

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BACKGROUND
This article reports the Polish adaptation of the Questionnaire to Assess Affective and Cognitive Empathy (QAACE) by Zoll and Enz – a multidimensional self-report questionnaire used to measure empathy in children aged 8-14. The QAACE is based on a two-factor cognitive-emotional model of empathy. It has a number of international adaptations and offers a convenient Polish-language tool for use with young children and adolescents.

PARTICIPANTS AND PROCEDURE
The sample consisted of 677 children aged 8-13. The survey was conducted on school premises, during classes, by an appropriately prepared researcher.

RESULTS
Confirmatory factor analysis revealed a good fitting measurement model representing the original underlying factor structure of the QAACE among Polish children. The reliability of the questionnaire as measured by Cronbach's α and McDonald's ω was good. The reliability of the scale as assessed by the test-retest method (after four weeks) was .80. We assessed the validity of the tool by analyzing the correlation of empathy with love and sadism. General empathy, as well as cognitive and affective empathy, is positively related to love. The hypothesis that sadism is significantly related to empathy was also partially confirmed. General empathy and affective empathy are negatively correlated with sadism, while there was no relationship between sadism and cognitive empathy.

CONCLUSIONS
The questionnaire is the first widely available tool of this type to examine empathy and its components appropriate for children and adolescents in Poland. The questionnaire can be a useful screening test for detecting children's level of empathy.

KEY WORDS
children; cognitive empathy; affective empathy

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BACKGROUND

With more than a century of research tradition (Montag et al., 2008), empathy is one of the oldest scientific conceptions (Cuff et al., 2016). Empathy and the processes it involves are an important factor influencing people's social functioning and development (Björkqvist et al., 2000; Decety & Jackson, 2006; Eisenberg et al., 2010). Initially it was viewed as one-dimensional (Feshbach, 1979; Hogan, 1969); however, currently, in both psychology and neuroscience, empathy is recognized as a multidimensional construct, usually of a two-factor nature, involving the affective and cognitive aspects (Melchers et al., 2016; Vachon & Lynam, 2016). The former generally indicates an affective trait, the capability for an emotional response which is consistent with another person's emotional state (Baron-Cohen & Wheelwright, 2004; Hoffman, 1982; Kerr-Gaffney et al., 2019). Cognitive empathy, on the other hand, refers to the ability to mentally understand another person's emotional states (Hogan, 1969). In other words, in considering empathy, the main emphasis is on the ability to understand other people and the ability to be in tune with their feelings and emotions, but also on the interconnectedness of these aspects with natural mechanisms. In view of this, empathy can be defined as the ability to share emotional states (i.e., to congruently experience other people's emotions in relation to their distress) and to understand (i.e., to form mental images of other people's emotional states) (Baron-Cohen & Wheelwright, 2004; Cuff et al., 2016; Davis, 1994; Decety & Jackson, 2004; Eisenberg et al., 2010; Gallant et al., 2020; Hoffman, 1985; Kerr-Gaffney et al., 2019; Sebastian et al., 2012).

MEASURING EMPATHY

Empathy can be measured as a general disposition or tendency (i.e., a feature) (Hoffman, 1982). Apart from that, researchers studying individual differences typically assess empathy as susceptibility to emotional stimuli (e.g., Emotion Contagion Scale; Doherty, 1997), or stable tendencies to experience empathy toward others (i.e., behavioral reactions; e.g. using the Interpersonal Reactivity Index; Davis, 1980; Singer & Klimecki, 2014), or as a situationally driven cognitive-emotional state (Duan & Hill, 1996). Others frame empathy as a multistage interpersonal process (e.g., Rogers, 1975).

It is particularly difficult to study empathy in children, not only because of the complexity of the phenomenon, but also because it is difficult to examine these processes due to children's lower verbalization and comprehension skills. There are still very few tools for studying empathy, particularly for use with younger children. The available methods include experimental methods, i.e., methods of recognizing emotions and interpreting situations (pictures or stories), and survey methods, that is, self-report inventories and structured interviews with children, parents or caregivers. Tools for measuring empathy in children are usually based on a close person's (teacher's, parent's) description of the behavior they have observed, in the form of an observation sheet, such as the Child Behavior Checklist (CBCL; Achenbach, 1992), or self-report questionnaires: the Empathy Quotient (EQ) by Baron-Cohen and Wheelwright (2004) and Basic Empathy Scale (BES), consisting of two parts referring to the components of empathy: recognition and reaction. Commonly used self-report scales for children include the following: Brenda Bryant's scale (Bryant, 1982), the children's version of the Interpersonal Reactivity Index (IRI) by Garton and Gringart (2005), the Basic Empathy Scale (BES; Jolliffe & Farrington, 2005), the Empathy Questionnaire for Children and Adolescents (EmQue-CA; Overgaauw et al., 2017) and the Kids Empathic Development Scale (KEDS; Reid et al., 2013), focusing on the emotional interpretation of interpersonal situations, in which the child tries to take the perspective of different people. These tools focus only on the cognitive or only on the affective dimension of empathy. Some researchers also propose expanding the empathy dimension to include a behavioral dimension (Reid et al., 2013).

Zoll and Enz (2010) proposed a tool for a comprehensive analysis of the phenomenon, using statements from the abovementioned scales. As a result of exploratory factor analysis, the authors obtained two factors which explained 31.19% of the total variance of the construct. Cognitive empathy consisted of 12 items, while affective empathy consisted of 10 items. The questionnaire developed in this way enables the simultaneous analysis of the cognitive and affective components of empathy in children. Also, validation of the questionnaire in a population of Bolivian children aged 8 to 14 also confirmed the two-factor structure of the empathy scale (Roth, 2020). Bearing in mind that the two-factor construct enables a comprehensive explanation of empathic behavior, it is important to undertake work on a Polish adaptation of the Questionnaire to Assess Affective and Cognitive Empathy in Children (QAACE), which will enable a reliable assessment of the phenomenon in Polish 8-14-year-olds (which is the age range indicated by the authors of the original scale).

PURPOSE OF THE RESEARCH

The purposes of the research presented here were to adapt the QACCE to the Polish language and to estimate its psychometric properties. We conducted

three independent studies. Study 1 aimed to confirm the structure and reliability of the QACCE. It was assumed that the two-factor structure of the empathy questionnaire would be replicated. The purpose of Study 2 was to test the reliability of the test-retest. In Study 3 we assessed the convergent and divergent validity of the QACCE by examining the associations between empathy and love, sadism and social approval (the validity data were collected after confirming the structure and reliability of the scale). To determine the convergent validity of the QAACE we analyzed the correlations between empathy and love and sadism. In the Polish cultural context, there is a shortage of empathy measurement tools useful for research in a group of children. Therefore, the study used the available tools (love and sadism scales), which in their theoretical assumptions correspond to the verified model of empathy and have proven accuracy and reliability. Based on previous research findings (Pajevic et al., 2018; Smith, 2008), the following hypotheses were made: (H1) empathy will be positively related to love, (H2) empathy will be negatively related to sadism.

DATA ANALYSIS

Analyses were performed in JASP, using IBM SPSS Statistics version 28.0 and the mclust package in R. Item endorsements in each response category and corresponding skewness and kurtosis values were calculated. The Item Difficulty Index (IDI) was used to assess the ceiling and floor effects (Aiken, 1979). A ceiling effect was observed when IDI > 0.8; the floor effect occurred when IDI < 0.2. Next, the factor structure and reliability of the QAACE were examined. The Velicer MAP method was used to find the optimal number of components to be extracted (Velicer, 1976). The Velicer MAP test is used to determine the underlying factor structure of a correlation matrix generally when an exploratory factor analysis is conducted. Using confirmatory factor analyses, the factor structure and construct validity were evaluated. Confirmatory factor analysis (CFA) with diagonally weighted least squares (DWLS) estimation implemented in JASP was applied to assess the factor structure of the scale. Model fit was evaluated using: the chi-squared statistic, the comparative fit index (CFI), the goodness-of-fit index (GFI) and the root-mean-square error of approximation (RMSEA) (Byrne, 2016; Hu & Bentler, 1999; Kline, 2015). Values of $\chi^2/df < 2$ suggest a good fit of the model to the data. Similarly, GFI and CFI values > .9 indicate a good and adequate fit of the model to the data. Finally, RMSEA values < .08 should also be interpreted as an acceptable fit to the data (Kline, 2015). We calculated Cronbach's α and McDonald's ω as estimates of reliability.

STUDY 1: FACTOR STRUCTURE AND RELIABILITY OF THE QACCE

PARTICIPANTS AND PROCEDURE

The sample consisted of 677 children aged 8-13 (M = 10.35, SD = 1.19). Around half of the participants were girls (53.6%). The survey was conducted in eight elementary schools in Warsaw and in four elementary schools in the Łuków county (in the Lublin voivodeship). The study was conducted with the approval of the Ethics Committee of the Faculty of Philosophy and Education, Eichstaett of the Catholic University of Eichstaett-Ingolstadt (no. 01/05/2019).

In accordance with the WHO standards (Erkut, 2010; Harkness et al., 2010) on procedures for adaptation and validation of tools for psychological research, in the process of adapting the questionnaire to Polish two independent translators were commissioned to translate the original English-language version into Polish. The next step involved appointing an expert panel, consisting of four members who specialized in developmental and emotional psychology, had experience in constructing and adapting self-report tools for children and were fluent in English. The expert group compared the translations to clarify discrepancies and choose the version of questions best fitting the theory and the specificity of Polish conditions in light of the construction of the questionnaire and the research model of the original tool. In the next step two other independent translators were commissioned to re-translate the questionnaire items to check the accuracy of the translation and fidelity to the original text. As a result of this translation analysis, corrections were made to questionable points in order to obtain an unambiguous version of the translation.

The validation procedure made it possible to prepare a final version (see Supplementary material) ready for use in testing a wider population of children. In accordance with ethical standards in psychological research, the guardians of all the children tested were informed in detail about the aims of the study, the research procedure and how the results were to be used. The survey was conducted on school premises, during classes, by an appropriately prepared researcher. A separate lesson (45 minutes) was allotted for completing the questionnaire in order to give students the freedom to respond.

MEASURES

The Questionnaire to Assess Affective and Cognitive Empathy (QAACE) by Zoll and Enz (2010) is a self-report questionnaire used to measure empathy in children aged 8-14, based on a two-factor cognitive-emotional model of empathy. The QAACE question-

naire consists of 22 questions and a five-point Likert type response scale from 1 (*I strongly disagree*) to 5 (*I strongly agree*). The questionnaire items were adjusted to create two groups of questions: one for the affective factor (10 items) and the other one for the cognitive factor (12 items).

RESULTS

Distribution of scores. Table 1 shows the basic descriptive statistics for the items. In some of the questions we observed ceiling effects (items 19, 20, 21: IDI > 0.8). Although important to note ceiling effects for future users of the scale, we prioritized the importance of validating the entire scale as it was originally designed; hence we decided to analyze all of the questions for the analysis of factor structure and reliability.

Table 1

Descriptive statistics of the items

	M	*SD*	Skewness	Kurtosis
Item 1	3.59	1.24	−0.63	−0.55
Item 2	4.24	1.04	−1.47	1.58
Item 3	3.93	1.05	−0.88	0.31
Item 4	4.18	1.09	−1.33	1.01
Item 5	3.99	1.18	−1.09	0.33
Item 6	3.08	1.55	−0.11	−1.51
Item 7	3.87	1.06	−0.82	0.23
Item 8	4.28	0.97	−1.49	1.91
Item 9	4.34	0.97	−1.56	2.05
Item 10	4.34	0.96	−1.63	2.42
Item 11	3.01	1.56	−0.03	−1.52
Item 12	3.52	1.20	−0.55	−0.47
Item 13	3.92	1.17	−0.93	0.02
Item 14	3.81	1.10	−0.72	−0.19
Item 15	3.97	1.13	−0.99	0.23
Item 16	3.97	1.11	−0.99	0.29
Item 17	4.17	1.11	−1.32	0.96
Item 18	3.57	1.26	−0.66	−0.50
Item 19	4.44	0.92	−1.84	3.18
Item 20	4.42	0.88	−1.67	2.68
Item 21	4.65	0.76	−2.67	7.83
Item 22	4.33	1.00	−1.62	2.19

Factor structure. Velicer's MAP method confirmed the presence of two empathy factors in the questionnaire. The model was also verified by confirmatory factor analysis with diagonally weighted least squares (DWLS) estimation. The results confirmed that the model with two factors provided a very good fit to the data: $\chi^2(208) = 397.54$; $p < .001$; $\chi^2/df = 1.91$; RMSEA = .037 (90% CI [.031-.042]); GFI = .99; CFI = .97. Table 2 presents the standardized estimates of the confirmatory model.

Reliability of the QAACE. Cronbach's α coefficient demonstrated good reliability of the QAACE, with α = .88. The composite reliability was also good, with McDonald's ω = .89. Cronbach's α coefficient for the reliability of the "affective empathy" factor was α = .84, McDonald's ω = .86. The reliability of the "cognitive empathy" factor measured with Cronbach's α was .76, McDonald's ω = .76.

Descriptive statistics of the indicators. The QAACE had values ranging from 24 to 110 points. The average for the total score was $M = 87.63$ ($SD = 12.57$; skewness = −.75; kurtosis = 1.25). The mean total score of the affective empathy was 47.58 ($SD = 8.30$), with an observed range between 12 and 60, a skewness value of −.91 and a kurtosis value of 1.12. The mean total score of the cognitive empathy was 40.04 ($SD = 6.05$), with an observed range between 12 and 50, a skewness value of −.75 and a kurtosis value of .96. The independent samples *t*-test revealed a difference in total empathy by sex ($t(675) = 3.94$, $p < .001$). Girls' ($M = 89.38$, $SD = 12.58$) total empathy scores were higher than boys' scores ($M = 85.60$, $SD = 12.27$). The independent samples *t*-test revealed a difference in affective empathy by sex ($t(675) = 4.70$, $p < .001$). Girls' affective empathy scores ($M = 48.96$, $SD = 7.80$) were higher than boys' scores ($M = 45.99$, $SD = 8.58$). The independent samples *t*-test did not show any difference in cognitive empathy by sex ($t(675) = 1.77$, $p = .077$). There was a low negative correlation between total empathy and age ($r = -.12$, $p < .001$), affective empathy and age ($r = -.12$, $p < .001$) and cognitive empathy and age ($r = -.07$, $p = .044$).

STUDY 2: ASSESSING THE TEST-RETEST RELIABILITY OF THE QAACE

PARTICIPANTS AND PROCEDURE

The stability assessment was carried out using a group of 42 pupils aged 8-10 ($M = 9.05$, $SD = 0.66$) from four public schools from Łuków county in the Lublin voivodeship, placed in Tomaszewica, Stoczek Łukowski, Zarzec Łukowski and Turze Rogi, consisting of 20 girls (47.6%) and 22 boys (52.4%). The test-retest interval was four weeks. Stability was confirmed with the Pearson *r* correlation, the intraclass correlation coefficient (ICC), and a dependent *t*-test.

Table 2

Standardized coefficient values of the estimated model

	Estimate	*SE*	*z*-value	*p*	95% CI	
					Lower	Upper
Cognitive empathy						
Item 1	0.60	0.02	23.39	< .001	0.55	0.65
Item 3	0.48	0.02	21.16	< .001	0.43	0.52
Item 5	0.67	0.02	24.50	< .001	0.61	0.72
Item 7	0.61	0.02	25.39	< .001	0.57	0.66
Item 8	0.43	0.02	20.11	< .001	0.39	0.48
Item 10	0.43	0.02	19.72	< .001	0.39	0.47
Item 12	0.50	0.02	20.10	< .001	0.45	0.55
Item 14	0.73	0.02	29.34	< .001	0.68	0.78
Item 16	0.57	0.02	22.81	< .001	0.52	0.62
Item 18	0.36	0.02	14.25	< .001	0.31	0.41
Item 20	0.32	0.02	16.05	< .001	0.28	0.36
Item 22	0.43	0.02	19.53	< .001	0.39	0.47
Affective empathy						
Item 2	0.69	0.02	26.75	< .001	0.64	0.75
Item 4	0.68	0.02	26.64	< .001	0.63	0.73
Item 6	0.62	0.02	21.77	< .001	0.56	0.68
Item 9	0.69	0.02	28.52	< .001	0.65	0.74
Item 11	0.63	0.02	21.88	< .001	0.57	0.69
Item 13	0.79	0.02	28.93	< .001	0.73	0.84
Item 15	0.63	0.02	24.90	< .001	0.58	0.68
Item 17	0.73	0.02	27.82	< .001	0.68	0.78
Item 19	0.51	0.02	23.97	< .001	0.47	0.55
Item 21	0.37	0.01	19.83	< .001	0.33	0.40

MEASURES

The Polish version of the QAACE tested in Study 1 was used again in Study 2 to assess empathy.

RESULTS

A *t*-test for dependent samples did not confirm differences between measurements of overall empathy ($t(41) = -0.04$, $p = .634$), affective empathy ($t(41) = -1.93$, $p = .060$), or cognitive empathy ($t(41) = 0.99$, $p = .325$). There was also a high stability index for the overall empathy scale ($r(42) = .80$, $p < .001$), and for the affective empathy factor ($r(42) = .82$, $p < .001$), and there was a satisfactory index for the cognitive empathy factor ($r(42) = .65$, $p < .001$). High stability was also confirmed by the ICC index; using the absolute compliance method, high ICC was observed for total empathy (ICC = .88, $p < .001$), for affective empathy (ICC = .90, $p < .001$) and for cognitive empathy (ICC = .77, $p < .001$). Measuring empathy using the QAACE has relatively high stability.

STUDY 3: ASSESSING THE VALIDITY OF THE QAACE

PARTICIPANTS AND PROCEDURE

The sample consisted of 203 children aged 8-13 ($M = 11.50$, $SD = 1.25$) from public and non-public

Table 3

Correlation matrix between empathy, love and sadism

	M	*SD*	1.	2.	3.	4.	5.
1. General empathy	81.55	12.52	–	.90***	.82***	.31***	−.18**
2. Affective empathy	43.55	8.25		–	.49***	.34***	−.25***
3. Cognitive empathy	37.99	6.17			–	.17*	−.03
4. Love	7.68	2.72				–	−.06
5. Sadism	3.26	1.92					–

Note. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

schools in Warsaw and Mińsk Mazowiecki. Just over half of the participants were girls (54.2%). The study was conducted by a properly prepared researcher who personally conducted the survey in the schools. In accordance with ethical requirements, the principal, teachers and parents were acquainted with the materials and written consent for children's participation in the study was obtained, and then students received paper versions of the questionnaire and were informed how to complete it.

MEASURES

The Polish version of the QAACE tested in Study 1 was used to assess empathy. Confirmatory factor analysis (CFA) showed the very good fit of the two-factor model to empirical data: ($\chi^2(169) = 185.05$, $p = .189$; $\chi^2/df = 1.09$; GFI = .95, CFI = .98, RMSEA = .023 (90% CI [.000-.043]).

The Constructive-Destructive Tendencies Questionnaire (KTKD) by Ulfik-Jaworska (2003) was used to measure destructive behavior in children. The subscales of love and sadism were used in the study. The love scale contains 12 statements about friendly and kind attitudes toward others. It comprises sensitivity to the needs of others, caring, and willingness to act for the benefit of others. Sample item: "When I see that my mother is tired, I try to help her with housework". The sadism scale consists of 12 statements examining the severity of sadistic tendencies in the relationships with other people, particularly using power and status to humiliate and degrade others. This scale also examines behaviors intended to harm someone in a physical or psychological way. Sample item: "I like to make others cry in play". In this study the reliability of the scales as measured by Cronbach's α for the love scale is α = .86 and sadism α = .66.

RESULTS

Correlation analysis revealed a significant positive correlation of general empathy, cognitive empathy and affective empathy with the love scale. General empathy was moderately positively correlated with love ($r = .31$, $p < .001$) and weakly negatively related to sadism ($r = -.18$, $p = .008$). Affective empathy was moderately positively correlated with love ($r = .34$, $p < .001$) and weakly negatively correlated with sadism ($r = -.25$, $p < .001$). In contrast, cognitive empathy was weakly positively correlated with love ($r = .17$, $p = .014$). The correlation between cognitive empathy and sadism was not significant ($r = -.03$, $p = .580$). Table 3 presents the correlations between QACCE and KTKD.

DISCUSSION

The aim of this study was to adapt and validate the Zoll and Enz (2005) Children's Empathy Questionnaire for use in a population of Polish children aged 8 to 14. Before using the measure in Polish conditions, it is important to conduct a local adaptation to verify validity and reliability compared to the original version of the questionnaire. The reliability assessment as well as the two-factor structure allowed us to confirm that the QAACE is an appropriate tool for measuring affective and cognitive empathy in this population. Confirmatory factor analysis revealed a well-fitting measurement model representing the structure underlying the QAACE. The reliability of the questionnaire as measured by Cronbach's α and McDonald's ω was good. Thus, we can conclude that the questionnaire is a simple and appropriate tool to be used with children, in which cognitive empathy and affective empathy are considered. Some authors studying empathy measurement (Gerdes et al., 2011; Reniers et al., 2011) have suggested that tools that measure it should reflect the multidimensionality of the construct, considering its different factors. Chrysikou and Thompson (2016) suggested including perspective taking and understanding another person as a component of cognitive empathy, and empathic concern and emotional solicitude as a variation of affective empathy. Consistent with previous research (Davis, 1983; Gerdes et al., 2011; Reniers et al., 2011;

Zoll & Enz, 2005), our analyses reveal that empathy is a complex and multidimensional construct. The stability of the tool was evaluated over a period of four weeks in a group of 8-10-year-old children, and the results seem to indicate high stability and thus high test-retest reliability.

The sex of the participants proved to be a significant variable in differentiating the levels of empathy. Our results correspond with previous findings suggesting that girls show higher levels of empathy than boys (Feshbach, 1975; Janicka & Niebrzydowski, 1994). In our study differences were revealed in general empathy and in affective empathy. We did not observe differences in cognitive empathy by sex. Our results also indicate that general, cognitive, and affective empathy decrease with age in children.

We assessed the validity of the tool by analyzing the correlation between empathy and love and sadism. Hypothesis one was verified, confirming previous results (Pajevic et al., 2018; Smith, 2008). General empathy as well as cognitive and affective empathy is positively related to love. The hypothesis of a significant relationship between sadism and empathy was also partially confirmed. General empathy and affective empathy are negatively correlated with sadism, whereas no relationship between sadism and cognitive empathy was noted.

The research presented in this article is correlational in nature, and the data only come from self-reports, so the results should be interpreted with caution. In the present case, the inclusion of self-report data does not affect the validation process, but to avoid this limitation, it seems interesting to use an experimental method in future studies. Future work on the QAACE will also require in-depth analysis of the questionnaire's validity. In future studies, it is worth looking at predictive validity and extending the construct validity of the scale. Future research could also focus on expanding construct validity analyses and using the scale with instruments that measure related variables, such as cooperation, altruism or aggression. This could be helpful in detecting undesirable behavior, such as bullying or aggression toward peers or other living beings.

The developed measure can be used not only in scientific research, but also in clinical practice as a screening measure of disorders based on lack of empathy, such as oppositional-rebelliousness, which in the future may develop into a dissocial personality. The developed tool will also be useful in assessing the effectiveness of psychopedagogical interventions undertaken to promote pro-social attitudes and behavior. This is because the scale will make it possible to report on the profit of the interventions conducted in terms of individual components of empathy (e.g., measurement at the end of each session). Due to its nature, the QAACE can be used in both paper-based and structured diagnostic interviews.

This paper presents the adaptation process and the results of the analysis of the psychometric properties of the Polish QAACE scale for assessing cognitive and affective empathy in children. Like the original, the Polish version of the QAACE shows good indicators of reliability, stability, and validity. The scale can be used with children aged 8 to 14. The tool will also be useful in therapeutic work, where prompt reporting of changes in relation to an intervention are required. For example, we could better understand bullying interventions and forgiveness interventions, and examine sex differences in aggression. The questionnaire can be a useful screening test for detecting children's level of empathy.

Supplementary material is available on journal's website.

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