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Theoretical Assumptions and Validation of a Scale for International Comparative Research on Teachers' Attitudes Toward Educating Talented Students

Abstract

The aim of the research was to construct a scale of teachers' attitudes toward the education of gifted students that could identify the types and predictors of attitudes. The research was prompted by the current lack of tools with good psychometric parameters. A questionnaire was prepared for the needs of an international comparative study on teachers (N = 630) from six Central and Eastern European countries: Belarus, Bulgaria, Poland, Romania, Slovakia, and Ukraine. The theoretical models of giftedness and empirical data both indicated the important role teachers play in the development of students' giftedness. The teachers' characteristics were somewhat ambiguous. The article describes the assumptions, construction stages, and validation results of the questionnaire, which contained 64 statements (items) selected from a wide range of opinions after thorough substantive and linguistic consultations. The fundamental descriptive statistics for each item were analyzed. The final selection of items occurred as a result of confirmatory factor analysis, which did not demonstrate sufficient fit between the questionnaire's theoretical structure and the data. Exploratory factor analysis, on the other hand, allowed for the version of the questionnaire

with a three-factor structure to be adopted. Three types of attitudes were identified regarding gifted students' education: one expressing a negative attitude and two positive ones. As a result of the validation, a scale of attitudes was created with appropriate psychometric characteristics, consisting of 33 items. Further studies are being conducted to interpret the three dimensions of the scale and the variables that differentiate them.

Keywords: gifted students' education, teachers' attitudes, attitude scale, validation

Introduction

In recent years, cultural analysis has been an important line of research on giftedness and creativity. The organization and effectiveness of gifted students' education at school reflects the characteristics of society, its values, interests, and attitudes toward gifted students, and the role of gifted people in society. Giftedness and creativity always appear and develop in an environment in which individuals are motivated, supported, and appreciated. The social environment includes social and cultural resources. A cultural educational resource refers to values, ways of thinking, and possible perspectives that may facilitate or impede the achievement of educational goals. Numerous studies have shown that the cultural educational resource for gifted students is the attitude of parents, teachers, and peers toward learning and education. The more positive these attitudes are, the more conducive they are to developing talent (Stoeger et al., 2018). Teachers' attitudes, in accordance with the systemic concept of giftedness, constitute a cultural educational resource for gifted students (Ziegler et al., 2017).

In intercultural research, the countries of East and West are usually compared with each other, where the West means the United States and Western Europe and the East means Southeast Asia. The most common difference between them are the dichotomies of individualism–collectivism (Lau, 1992; Lau et al., 2004) and egalitarianism–elitism (Freeman, 2015). The area that is forgotten in intercultural research on giftedness

is Central and Eastern Europe. This region has become a field of research on teachers' attitudes toward gifted students' education, which will be presented in the part of the article concerning the measurement of attitudes.

The role of teachers in the education of gifted students

Teachers have the greatest real impact on achievements and the development of students' giftedness (Salcher, 2009). The importance of teachers is indicated in both educational practice (educational biographies of gifted people) and theoretical concepts (Cieślukowska, 2005). In a new report from a study on gifted British and Polish students' retrospective perception of the school environment, Marcin Gierczyk and Steven I. Pfeiffer (2021) confirmed that according to both groups of students, teachers played an extremely important role in the development of their talents. The role of teachers is included in giftedness models, such as the Talent Development Mega Model (Subotnik et al., 2015), the Actiotope Model of Giftedness (Ziegler, 2005), the Differentiated Model of Giftedness and Talent (Gagné, 2004), the Munich Model of Giftedness (Heller, 2005), and the Three-Ring Conception of Giftedness (Renzulli, 2005).

Teachers of gifted students have an ambiguous image when it comes to the attributes that determine their effectiveness in working with gifted students (Matheis et al., 2017). This results from the different needs of students, their age, features of the school system, the characteristics of a gifted student's family, and the nature of talents in a particular area. The most frequently recognized are professional features – competence, knowledge of giftedness, professional development, professional motivation, experience in working with the gifted, teaching methodology, and interpersonal skills – and individual features such as age, commitment, self-confidence, faith in students' achievements, a friendly attitude toward students, care, reflectiveness, and autonomy (Khalil & Accariya, 2016). These variables may be arranged on the axis of knowledge and personality. The characteristics of teachers of gifted students coincide with those of good teachers (Tirri, 2008). In the literature on the subject, a good

teacher is defined as one whose students achieve more in their educational pursuits (Hanushek & Rivkin, 2007). The research by Eric Hanushek and Steven Rivkin (2007) shows that it is very difficult to conclude which qualities of a teacher make them effective. Factors such as the type of education or professional experience are not considered significant. This problem has also been noted by Polish researchers dealing with the determinants of learning outcomes. Kamila Hernik, Karolina Malinowska, and Kamil Sijko (2014) write that

the variables we examined, i.e. the seniority in the teaching profession, the degree of career progression, the teacher's social background, and psychological variables (attitude toward social domination and a sense of happiness), are not related to their students' test results. (p. 266)

Relationships with the variables related to the teacher should be expected elsewhere – primarily in the variables resulting from the observation of what the teacher does, i.e., from the observation of the lesson they teach or their didactic work. (Hernik et al., 2014, p. 268)

Roman Dolata (2014) states similarly that

certainly, among the various school factors, this is the teacher who has the strongest influence on the school achievements of students. On the other hand, several decades of intensive research on teachers have failed to explain what characteristics of teachers make them teach effectively or ineffectively. The results of the SUEK study [abbreviation from Polish: School Determinants of Education Effectiveness study] unfortunately once again confirmed that we are still unable to explain the teacher effect. (p. 307)

Questionnaires completed by teachers inquire about their opinions on various areas of gifted students' education: the perception of a gifted pupil, the competences needed to work with gifted students, the methods

and forms of work, experience, existing procedures, identification, and school support (Bochniarz & Grabowiec, 2019; Cieślukowska & Limont, 2010; Dyrda, 2012; Giza, 2006). Teachers assess their own skills highly. This is in contradiction with the actual state of affairs, which has not changed for many years: In schools, gifted students are still given little attention and support is rarely provided and covers a narrow scope (Bochniarz & Grabowiec, 2019).

Another approach in understanding the particular situation of teachers of gifted students is to study their attitudes. Teachers' attitudes toward gifted students and their education have been the focus of attention and research of giftedness educators for over 70 years (McCoach & Siegle, 2007). However, I have not found any Polish research in this area.

The ineffectiveness in explaining *the teacher effect* in gifted students' education through individual characteristics, the discrepancy between the declarations and the realities of gifted students' education, as well as the lack of Polish research on teachers' attitudes toward gifted students' education prompted me to analyze the literature and to prepare a concept for research on attitudes. The interest in the study of attitudes was also due to the fact that one seeks the causes – at least partial causes – of people's behavior toward various categories of objects or situations with which they come into contact (Nowak, 1973, p. 7). The correlation of attitudes with behaviors is high and, as Bogdan Wojciszke (2011, p. 210) argues, contrasting opinions are usually based on unreliable studies.

Teachers' attitudes toward gifted students' education – A research review

Social attitudes toward gifted people are an important area of research on giftedness (Heller & Schofield, 2000; Shaughnessy & Persson, 2009). They are part of the social capital available to gifted students (Renzulli, 2002). The attitudes of society toward gifted students influence the scope and forms of their education (Subotnik et al., 2011). Cultivating positive attitudes is important in providing these students with educational

opportunities appropriate to their needs. Thus, the attitudes that teachers adopt toward gifted students is important for the professional development and culture of the school (Clark, 2002; Lassig, 2009). It influences not only practical actions and approaches toward teaching, but also the behavior of the parents and peers of gifted students, as well as the classroom atmosphere that ensures optimal talent development (Lassig, 2009). Individual statements or assessments expressing teachers' attitudes are not only subjective opinions, but they articulate the cognitive interests of the entire profession of teachers.

Teachers' attitudes help in understanding relationships with gifted students and to explain the work undertaken to develop giftedness (Bégin & Gagné, 1994). It is important to first discover and understand attitudes and only then to implement effective training programs. It is crucial to discover and understand teachers' attitudes and beliefs about the education of gifted students for more effective education. It also makes it possible to assess the extent to which these attitudes are shaped by prejudices, stereotypes, and common opinions and the extent to which they are justified by theory.

In empirical research, the scales developed in the 1980s by François Gagné and his associates Lorraine Nadeau and Jean Bégin (Gagné, 2018) are usually used. The Attitudes Toward Gifted Education (ATGE) questionnaire is available in two versions and includes 60 statements, 30 of which are common to both versions. The second questionnaire is a 34-item scale, Opinions about the Gifted and their Education (OGE), divided into six subscales: Needs and Support, Resistance to Objectives, Social Value, Rejection, Ability Grouping, and Acceleration. It applies a 5-point Likert scale. The guidelines suggest calculating seven average scores, one for each subscale plus the total score (Gagné & Nadeau, 1991). Along with the study of attitudes, one study also attempted to identify their predictors (Bégin & Gagné, 1994). A comprehensive literature review was carried out (35 studies from the 1970s and 1980s including approximately 50 variables) and the ten most "promising" predictors were empirically verified and finally reduced to two: socioeconomic status and contact with giftedness. The scores on attitudes from the entire research sample

(139 teachers and 138 parents) ranged from 1.9 (very negative attitude) to 4.6 (very positive attitude), with an average of 3.4. Bégin and Gagné stated that the most favorable attitude toward the education of gifted students was represented by a well-educated, high-income teacher, childless or with one or two children (1994).

The questionnaire is still very popular, which is reflected in the number times the OGE is used (Gagné, 2018) and the wealth of papers in the literature on the subject. The research in various countries indicates that the psychometric properties of the translated versions of OTG and ATGE are not sufficient. First of all, it was not possible to confirm the six-factor structure of the questionnaires, as demonstrated by Slovenian (Jurišević & Žerak, 2019), Croatian (Perković Krijan & Borić, 2015), American (McCoach & Siegle, 2007), Greek (Polyzopoulou et al., 2014) and Irish (Cross et al., 2018) researchers. In contrast, researchers from Serbia (Blanuša et al., 2021) reported a positive validation of the questionnaire.

In 2018, Gagné published an article titled "Attitudes Toward Gifted Education: Retrospective and Prospective Update," in which he carried out a critical analysis of the current measurement of attitudes toward the education of gifted students. The author pointed to the main weaknesses: The questionnaires do not take into account the changes that have occurred over the last four decades; they do not investigate the relationship between attitudes, political and cultural values, or features of education systems; there is a lack of current research with representative samples; the measurement results do not meet the psychometric criteria; and there is no good questionnaire to assess the general attitude toward the gifted and their education. Consequently, Gagne (2018) designed an empirical research program that would lead to the creation of a new research tool: the General Attitude toward the Gifted, their Needs, and their Education (GAGNE).

One of the latest and least known areas of research on attitudes – and the most interesting for me because of my own project – is the differences observed at the intercultural level. Mary K. Talent-Runnels, Kirsi A. Tirri, and Aida Medina Adams (2000) conducted a cross-cultural study using the ATGE questionnaire among school and kindergarten teachers and those

from gifted programs in Finland and the United States. Several cultural differences were identified. Negative attitudes toward gifted children were most often expressed by the kindergarten teachers. The Finnish teachers were more concerned about the negative side effects of special classes and other particular solutions for the gifted outside of classrooms than their American colleagues. The Finnish teachers were apprehensive about the possible negative effects of segregation. In Finland, the main emphasis is on providing equal opportunities and high-quality educational services for all students. Teachers promote the skills of gifted students, who – in a diverse class – provide a good example for the less gifted (Tirri & Talent-Runnells, 2004).

In another study that applied the same research tool, cultural differences among Finnish, American, and Hong Kong teachers were identified (Tirri et al., 2002). The teachers from Finland and the USA were more similar in their attitudes than were their Hong Kong colleagues. The latter teachers were a more homogeneous group in terms of attitudes than the Finns and Americans. The attitudes in the American group were the most diverse. The most discriminative item in the questionnaire was statement No. 60: "There are no gifted children in our school." The teachers from the USA and Finland strongly disagreed with this point, while the Hong Kong teachers disagreed significantly less. The second-most discriminative variable was statement No. 47: "Talented people should spend their leisure time helping those who learn more slowly." This variable was mostly supported by the Hong Kong teachers. The teachers from the USA represented all kinds of attitudes toward this opinion, and the Finnish teachers adopted two opposing attitudes. These results reflect the difference between the assistance-oriented Asian culture and the more independent Western culture. The third-most discriminative statement in the questionnaire was No. 18: "All children are gifted." The Hong Kong teachers differed from the Western teachers in their answers: The Asian teachers disagreed the most in this regard, while the Finnish teachers agreed the most and those from the USA presented varying responses.

Following an analysis of the literature, particularly regarding 1) my critical evaluation of the OGE and ATGE, 2) the ambiguous results of

psychometric analyses of attitude scales published by researchers from different countries, 3) the cognitive and practical significance of international comparative studies – which indicate that differences between countries are related to cultural values and educational policy (features of the education system) – and 4) the cultural diversity of the countries covered by the research project, I decided to construct a scale to measure the cultural contexts of teachers' attitudes toward gifted students' education.

The starting point was to explain the construct of *teachers' attitudes toward gifted students' education*.

The importance of the construct of *teachers' attitudes toward gifted students' education*

The concept of attitude is well described and explained in the social sciences. It is interdisciplinary, which means that it is applied by researchers from various disciplines. There is no single or unified theory of attitudes; researchers use definitions of *attitude* with one, two, or three components.

Stefan Nowak's definition (1973) is representative of the three-factor understanding of attitudes:

The attitude of a certain person toward a certain object is the whole of relatively permanent predispositions for evaluating this object and reacting to it emotionally, and relatively persistent beliefs about the nature and properties of this object as well as relatively permanent predispositions to behave toward this object, accompanying these emotional and evaluating predispositions. (p. 23)

This definition understands an attitude as a three-element affective/cognitive/behavioral structure. Nowak calls the attitudes covering all three components *full attitudes*. He recognizes the affective component as the most important one, without which it is impossible to discuss attitudes. Emotions/judgments appear at the very first moment that the object of

an attitude emerges; they are decisive and they influence beliefs and trigger actions. Similar viewpoints were expressed by Mirosława Marody (1976) and Stanisław Mika (1984). Other components may or may not exist in the attitude. Bogdan Wojciszke (2011) adopted a definition of an attitude that refers to a permanent emotional relationship: "A person's attitude toward an object (person, thing, event, or idea) is a relatively permanent tendency for them to value this object positively or negatively" (p. 200).

All three components of an attitude are interrelated and conditioned. There may be inconsistency and contradiction between them. They may have various values of emotions. Changing one component of an attitude results in changes in its other components. The starting point for a scale of teachers' attitudes toward gifted students' education was to adopt a structural three-factor concept of attitudes. It was assumed that in pedagogical research one should not abandon the behavioral dimension,¹ especially when there is a possibility of inconsistencies between behavior, knowledge, and emotions.

An attitude is always *someone's* attitude and is *toward* some object. The research subject is the attitudes of teachers working in generally accessible public schools. No selection was used in choosing the teachers. In most countries, gifted students are educated within a functioning education system, including the existing resources of the teaching staff. Gifted students usually do not have the opportunity to choose their teacher. They are subjected to the influence of people with diverse attitudes toward giftedness and the need to support them.

Education was defined by Wincenty Okoń (2003) as a process,

a sequence of events ordered in time, including such activities of teachers and students, targeted by the appropriate selection of purposes and content of education, as well as by such conditions and means that serve to cause changes in students, applying to the adopted goals. (p. 133)

¹ A similar standpoint was adopted by Krzysztof Szmidt (2019, p. 275), who constructed the model of the creative attitude structure.

Giftedness is understood to be outstanding potential which will most likely be completed if the students experience appropriate learning opportunities based on their predispositions, interests, and needs at various stages of development (Gagné, 2018; Renzulli & Reis, 2018; Subotnik et al., 2018). A gifted student is one who has above-average potential and opportunities for high achievement. Therefore, ensuring proper conditions for their education requires the use of appropriate material, methods of teaching and learning, and involvement in various enrichment and extracurricular activities. The purpose of educating gifted students is to develop their talent (Renzulli, 2021; Subotnik et al., 2018).

Stages and principles of constructing the scale

The construction of scales is defined by precise principles and rules of procedure (Hornowska, 1999/2007). It is not a goal in itself, but it serves to describe groups of people selected by their characteristics. First, its domain (construct) and purpose must be defined. The area of measurement is the teachers' attitudes toward gifted students' education. The purpose is to answer the following questions: What attitudes do teachers adopt toward a specific construct? How can the differences in these attitudes be explained? What explanatory variables for individual and cultural differences are significant? The research involved teachers of public schools who teach children and adolescents of school age in large cities in six countries of Central and Eastern Europe: Belarus, Bulgaria, Poland, Romania, Slovakia, and Ukraine (N = 630).

It was assumed that the educational and cultural system of a given country significantly influences how gifted people are perceived and how they are able to develop their predispositions. The importance of macrosystems in gifted students' education is still relatively unknown (Ziegler et al., 2017). Comparative cross-cultural studies usually reveal differences in the attitudes of people living in various cultures. "Knowing some of the characteristics of these cultures, one may try to reflect on what factors could influence the formation of such and no other attitudes" (Mika, 1984, p. 59).

The challenge was to ensure the comparability of respondents from six countries. For this purpose, a content and linguistic analysis was performed. In order to adapt the tool to various cultural conditions, care was taken to select the statements from the entire research area. The statements came from the literature analysis and interviews with teachers and researchers/specialists. The author's study visits to the countries included in this research were supportive. Efforts were made to make the final set of items diverse (i.e., including extreme and neutral, positive, negative, and mixed, and inversely diagnostic opinions). All of the statements had a closed-ended format. The statements were selected substantively, so that they are accurate in terms of content.

The problem of language and culture as well as the associated risk of measurement errors was addressed in several stages of verification (Hornowska, 1999/2007): when collecting the statements, during consultation, and when translating and proofreading with language and substantive specialists. The test was first translated by translators and then verified by scholars in terms of its adequacy for the research subject. A five-point Likert scale was used for the assessment (the response categories were "I disagree," "I rather disagree," "hard to say," "I rather agree," and "I agree"). As Jerzy Brzeziński (1999) indicates, the use of a five-point scale allows for a relatively high internal consistency of individual dimensions.

At the preliminary stage of work on the questionnaire, 150 statements were collected. After content selection and expert consultations, a version of 62 statements (items) was created. Attitudes are always measured on a limited sample of behaviors, because it is difficult to draw up a complete list of behaviors related to the attitude being measured.

There are two strategies for constructing measurement scales and defining the dimensions they represent: logical/theoretical and empirical (Hornowska, 1999/2007, p. 83). The starting point for the first strategy is the theory of the feature being measured, while in the second one, the structure of the phenomenon in question is derived from the data, based on the results of factor analysis (Hornowska, 2007). In the research on the attitudes of teachers from six Central and Eastern European countries

toward gifted students' education, it was assumed that the attitudes would result from empirical relationships between test items. Without completely rejecting the theoretical approach at this stage, 62 items were analyzed and grouped, in accordance with the definition of attitude: 19 items to the affective dimension, 21 items to the cognitive dimension, and 22 items to the behavioral dimension.

The final version of the scale was created following the validation of the 62-factor questionnaire. Validation is a necessary procedure in the social sciences because it leads to accurate and reliable measurement of theoretical constructs. The final selection of the items was a result of statistical calculations. Factor analysis eliminated statements with low factor loadings and identified common attitudes that underly the different opinions.

Data analysis and statistical description

The first stage of the analysis covered the entire sample ($N = 630$) in order to establish one general model for all data.

Missing data analysis

It was found that the percentage of the missing data for one test item did not exceed 5% (0%–4.3%). Little's test indicated that the deficiencies were not completely random ($\chi^2(5125) = 5918.54; p < 0.001$); therefore, the missing data were replaced by Expectation–Maximization estimation (EM).

Preliminary data analysis

At this stage, the basic descriptive statistics of each of the questionnaire's 62 items were analyzed. On the basis of a variance value of < 1 , six items were excluded from further analysis.

Confirmatory factor analysis (CFA)

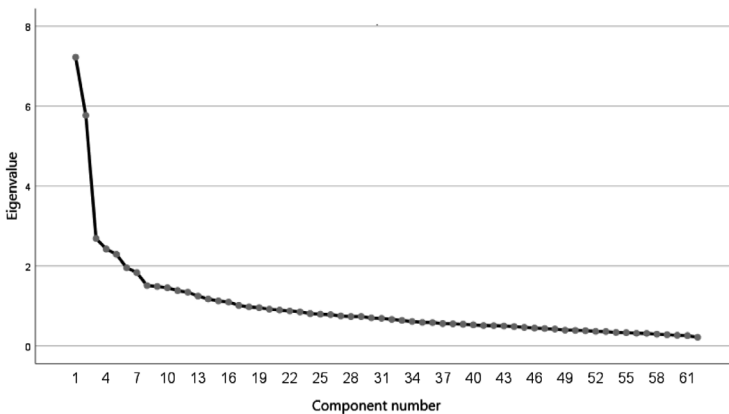
In order to confirm the theoretical structure of the questionnaire, confirmatory factor analysis was performed. The analysis did not demonstrate that the assumed model fit the data well ($\chi^2/df = 4.93$; CFI = 0.332;

RMSEA = 0.079; SRMR = 0.117)². Then, the model included second-order factors, creating three more general scales consisting of three subscales each. Again, the analysis did not reveal a sufficient fit with the data ($\chi^2/df = 5.04$; CFI = 0.304; RMSEA = 0.080; SRMR = 0.119).

Exploratory factor analysis (EFA)

The measure of the selection adequacy of the Kaiser–Mayer–Olkin input variables (0.803) and the results of Bartlett’s test of sphericity ($\chi^2 = 12015.78$; $df = 1891$; $p < 0.001$) confirmed the validity of the factor analysis. Therefore, exploratory factor analysis was performed using the principal components method with Varimax rotation. Because the eigenvalues were greater than 1 (Kaiser criterion), a 17-factor structure of the questionnaire may be assumed. These factors explain a total of 59.70% of the variance. Based on the scree plot (Figure 1), a three-factor or seven-factor solution may be adopted.

Figure 1. Scree plot



Due to the lack of unambiguous information on the number of factors that should be included in the structure of the questionnaire, several alternative methods were used to determine the optimal number of

² SRMR – standardized root mean square residual; RMSEA – root mean square error of approximation; CFI –confirmatory fit index. Acceptable fit values are as follows: $\chi^2/df < 5$; CFI > 0.90; RMSEA < 0.08; SRMR < 0.10 (Hu & Bentler, 1999).

factors and the optimal solution was selected as a result. Among the available methods, the ones selected for testing were Velicer's Minimum Average Partial test (VMAP) and comparison data (CD) (Courtney & Gordon, 2013). The VMAP test showed a seven-factor structure for the questionnaire, while the CD method showed an eight-factor structure. Both structures were tested by measuring factor loadings along with reliability (Cronbach's alpha). Any items with a loading value below 0.4 were excluded from the analysis (Samuels, 2017). As a result of these measurements, the reliability of all seven or eight factors was insufficient.

Subsequently, a second three-factor solution resulting from the scree plot was tested with Varimax and Promax rotation. The resulting two three-factor structures were found to be similar to each other. The analysis determined that the three-factor structure with Promax rotation was better. Despite the fact that factor 3 had a lower reliability value (below 0.7), it was at an acceptable level (Taber, 2018). The values of factor loadings for the three-factor solution with Promax rotation are provided in Table 1.

Table 1. The Value of Factor Loadings for 3 Factors (Types of Attitude)

Factor 1 – 13 items; reliability = 0.802		
P32	The school has no major impact on the recognition and development of giftedness.	0.653
P44	In a democratic society, gifted students should not be specially supported in public schools.	0.619
P55	Girls in school are less encouraged to develop their talents than boys.	0.618
P25	Teachers cannot recognize the talents of a disadvantaged child.	0.593
P49	Gifted students are rarely supported by teachers in my professional environment.	0.573
P51	Gifted students are usually not very creative.	0.566
P27	Gifted students' education should be a private matter for such students.	0.505
P33	In a typical classroom, there are no conditions for working with gifted students.	0.500
P21	A gifted child from a low-status family is unlikely to succeed in school.	0.462
P56	Gifted students often suffer from emotional development disorders.	0.462
P17	Gifted students should be educated in special schools for the gifted.	0.458
P52	Gifted students care most about success.	0.436
P34	Talents other than those developed in school are important in life.	0.425

Factor 2 – 13 items; reliability = 0.778		
P53	The successes of gifted people raise the prestige of the school, family, and state.	0.754
P60	Gifted people are the wealth of a nation and they need special care.	0.646
P30	Even the greatest talent will not develop without effort (work or training).	0.619
P39	All students, regardless of giftedness, should be treated in the same way.	0.556
P45	Gifted students like to compete.	0.547
P20	Gifted students' parents support their development very much.	0.518
P59	Everyone enjoys the results of gifted people's learning and work.	0.506
P19	Gifted students cause fewer educational problems at school than their peers.	0.481
P54	Gifted people have a better position on the job market than average gifted people.	0.459
P2	Every gifted student has the opportunity to develop interests in extracurricular activities.	0.451
P36	The successes of gifted students are also the successes of their teachers.	0.436
P48	Gifted girls are more often perfectionists than gifted boys.	0.431
P31	Gifted students from low-status families are able to succeed in school because they are more motivated than their peers.	0.407
Factor 3 – 7 items; reliability = 0.582		
P4	Gifted students often receive material support to develop their talents.	0.700
P1	We have clear procedures at school for working with gifted students.	0.530
P3	The gifted have good access to out-of-school facilities (community centers, youth centers, etc.).	0.498
P8	Knowledge about giftedness was provided at my university or in vocational training.	0.447
P12	Only teachers who are exceptionally professionally committed work with gifted students at school.	0.432
P14	I believe that the achievements of gifted students depend on my work.	0.425
P28	If a student is exceptionally gifted in one particular field, the requirements in other subjects may be reduced.	0.405

Conclusion

As a result of the validation, a scale of attitudes with appropriate psychometric characteristics consisting of 33 items was created. The CFA did not reveal sufficient fit between the theoretical structure of the questionnaire and the data. On the other hand, EFA allowed for the version of the questionnaire with a three-factor structure to be adopted. Three

types of attitudes were thus identified: one that expresses a negative attitude toward gifted students' education and two that are positive. These attitudes include cognitive, emotional, and behavioral components, but they are represented to varying degrees in particular dimensions. Further studies are underway to interpret the three dimensions of the scale as well as the individual and cultural variables that differentiate them.

The results confirm the validity of the methodological assumptions and the entire international studies project. As Abraham N. Oppenheim (2004) stated,

the factor analysis of the scale of attitudes also creates the possibility for intercultural comparisons. However, as a rule this causes problems with an equivalent semantic translation. Moreover, one never knows if the structure of attitudes is identical in various countries. Nevertheless, if the scales were translated and the factor analysis demonstrated similar results in different countries, it would strongly indicate a similar structure and point to the possibilities of intercultural comparisons. (p. 233)

The research is of theoretical importance for the pedagogy of talents as a new typology of teachers' attitudes and of practical importance for improving teacher education by identifying those components of attitudes that are the least favorable for the education of gifted students and those which should be strengthened.

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