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The Development of the Educators' Attitudes toward Gifted Education Scale

Mehmet Ali Öztürk[1] and Abdullah Fıçıcı[2]

[1] *Bahçeşehir University, Istanbul, Turkey;* [2] *Fatih University, Istanbul, Turkey*

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ABSTRACT

This article reports a study intended to develop a scale that measures attitudes of preschool through university in-service educators toward gifted education. After a thorough review of the literature on the topic, the first version of the scale was developed with 24 Likert-type items intended to measure four dimensions of the construct (six items for each). The scale was given to 421 preschool through university in-service educators (teachers, school counselors, school administrators, etc.) working at various schools or educational institutions in Istanbul, Turkey during the 2011-2012 school year. After a listwise deletion of missing data, the analyses were done on 360 cases. Based on results from exploratory factor analysis on one half of the data, nine items were eliminated and 15 retained. The revised scale could still measure all four dimensions with at least three items each. The factor structure of the revised version of the scale could be cross-validated on the second half of the data through confirmatory factor analysis. Internal consistency reliability coefficients of the whole revised scale and the subscales were acceptable. The resulting scale is a valid and reliable instrument with the potential to be adapted to various educational systems in the world.

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Gifted Education, Teacher Attitudes, Factor Analysis, Scale Development

Introduction

The treasure of gifted student body has become increasingly important for nations that are competing for the global market. One of the crucial factors in gifted education is teachers' attitudes towards these students and their educational needs. While researchers have been interested in this topic for quite some time (Justman & Wrightstone, 1956; Peachman, 1942 as cited in McCoach & Siegle, 2007), the findings have been mixed (Cramond & Martin, 1987; McCoach & Siegle, 2007). Some researchers found positive attitudes of teachers towards gifted students and gifted education (e.g., Gagne, 1983); some others found negative attitudes (e.g., Geake & Gross, 2008); while still others had mixed results (e.g., Jacobs, 1972). While there might be other methodological explanations for these contradictory findings such as sampling problems in previous studies (McCoach & Siegle, 2007), literature suggests that a possible reason is the lack of a valid and reliable instrument that measures teachers' attitudes toward gifted students and gifted education.

One of the commonly known instruments in this field is Gagne and Nadeau's (1985, 1991) attitude scale. Before they decided to create their own scale to measure attitudes toward giftedness, Gagne and Nadeau (1985) examined 15 existing scales in light of four quality criteria for a measurement instrument. At the end of their assessment of these 15 instruments, they were not satisfied with any of them. They wrote 145 statements and classified them into 12 categories. The final instrument had six dimensions after a series of factor analyses. These dimensions were 1) Support for special services 2) Objections to special services 3)

[1] Corresponding author's address: Bahçeşehir University, Faculty of Educational Sciences, Çırağan Cad. No: 4 Beşiktaş Istanbul Turkey
Telephone: + 90 212 381 0303
Fax: + 90 212 381 0300
e-mail: mehmet.ozturk@bahcesehir.edu.tr
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Opposition to acceleration 4) Perceptions of rejection and isolation 5) Social value, and 6) Opposition to homogeneous grouping. At least one problem about this scale is that "support for special services" and "objections to special services" may be on the same continuum, measuring the same dimension. The fact that the group of items measuring support was positively worded while items measuring objections were negatively worded does not seem to be a good rationale to treat these two as separate dimensions. This, in turn, might make replicability of the factor structure difficult due to the overlap between the two dimensions. Not surprisingly, McCoach and Siegle (2007) could not confirm the six-factor structure of the scale for their own sample. They settled on a three-factor solution after an exploratory factor analysis on their own sample. One of the changes they made on the scale was combining the two "special services" subscales mentioned above under a single one called "Support". They named the other two subscales for which they borrowed items from Gagne and Nadeau (1991) as "Elitism" and "School Acceleration". For their study, they also created a totally new subscale they labeled as "Self-Perceptions as Gifted".

In their review of literature on predictors of attitudes toward gifted education, Begin and Gagne (1994) mentioned a variety of problems around the measurement of attitudes in the studies reviewed. These problems included but were not limited to asking only a few questions, not reporting the psychometric properties of the instrument used, and measuring only a specific and/or marginal dimension of attitudes toward giftedness. Overall, they were not satisfied with the measurement aspect of the studies they reviewed. Consequently, of the eight recommendations they made for future research on the topic, four were directly related to measurement.

In another study using Gagne and Nadeau's (1985) scale, Tallent-Runnels, Tirri, and Adams (2000) could not reproduce the factor structure obtained by Gagne and Nadeau (1985), and ran a new exploratory factor analysis on their own data. Using an oblique rotation instead of an orthogonal used by Gagne and Nadeau (1985), they concluded that their data from a sample of teachers from Finland and the U.S. suggested an 18-factor solution. They labeled these factors as 1) Enrichment alternatives 2) Special needs of the gifted 3) Investment for gifted 4) Social problems 5) Acceleration 6) Advantages of being gifted 7) Special classes for the gifted 8) Everybody is gifted 9) Equality of opportunities 10) Equitable practices 11) Current situation in schools 12) Special programs for gifted 13) Consequences of gifted education 14) Future directions in gifted education 15) Priorities in special education 16) Freedom to progress 17) Enrichment vs. acceleration, and 18) Labeling. When Tirri, Tallent-Runnels, Adams, Yuen, and Lau (2002) added a group of teachers from Hong Kong to the original sample of Finnish and American teachers, they came up with a 16-factor solution for the same scale.

Regardless of whether the researchers (Tallent-Runnels et al., 2000; Tirri et al., 2002) came up with a 16- or 18-factor solution, there were problems with the scale developed in these two studies. First, there were conceptual overlaps between the factors, which were quite hard to avoid with a high number of factors extracted. For example, in the 18-factor solution, the authors labeled two different factors as “Special programs for the gifted” and “Special classes for the gifted”. Most probably, an individual’s attitudes toward these two practices are quite similar; therefore, conceptualizing them as two separate factors is misleading. Actually, the researchers admitted that they did not look for a solution with a simple structure (i.e., no significant cross-loadings) in their factor analysis with an oblique rotation, which meant that a given item could significantly contribute to multiple factors. Tallent-Runnels et al. (2000) stated that “It is also a property of oblique rotation that items can get high loadings on several factors. This did occur with the 18-factor solution. The highest loading item with the support from the other high loading items guided the decision to name the factors (p. 106)”. Refuting this incorrect approach to oblique rotation, DeVellis (2012) explains that an oblique rotation does not obliterate the goal of achieving a simple structure in factor analysis, and that correlations allowed to exist between factors in an oblique rotation do not legitimize items’ having high cross-loadings.

Even if a simple structure (i.e., no significant cross-loadings) were obtained by the researchers (Tallent-Runnels et al., 2000; Tirri et al., 2002), one could still speak of two weaknesses for the scale. First, a high number of factors extracted typically makes the obtained factor structure sample-specific; therefore, having a large sampling error. This, in turn, makes the results hard to cross-validate on a different sample from the same population. Second, it asks about attitudes toward issues/practices specific to a limited

number of countries, which makes the scale very hard to adopt for research in other countries where these practices do not exist.

As can be gathered from the literature review above, there is a need for a scale that produces reliable and valid measurement of educators' attitudes toward gifted education. The research reported in this article was intended to fill this gap. To this end, we have created a scale entitled as Educators' Attitudes toward Gifted Education Scale, with four subscales thought to represent four different dimensions of educators' attitudes toward gifted education. Our approach has been that each subscale could produce reliable and meaningful data about a different dimension of educators' attitudes toward gifted education. We thought that such a scale could be used by educational administrators, policymakers, and researchers to assess educators' attitudes. These assessments could provide valuable information in identifying individuals' or groups' misperceptions about or incorrect approaches to gifted students and their education. Such information, in turn, could be used in designing a variety of policies and practices aimed at improving educators' attitudes toward gifted students and gifted education, including but are not limited to in-service training programs for educators and mentoring programs for the newly hired. We designed the scale for all Pre-K through university in-service educators such as teachers, school administrators, and school counselors, with the thinking that all these educators are either current or potential educators of the gifted.

The present article first explains how the initial version of the scale was developed. It, then, reports the exploratory factor analyses that resulted in the final version of the scale. The cross-validation of the final version through a confirmatory factor analysis is followed by the reliability analysis of the scale.

Method

Shaping the First Version of the Educators' Attitudes toward Gifted Education Scale

Since the primary target population was educators in Turkey, we developed the scale in Turkish. We had two considerations while shaping the first version of the instrument. First, despite mixed psychometric qualities of scales that we had come across in the literature in English, we considered the dimensions included in these scales. Second, while trying to adopt these dimensions for the scale we developed, we took into account the relevance of these dimensions for the Turkish education system. For example, one of the scales mentioned in the literature (Tallent-Runnels et al., 2000) had a dimension about attitudes toward enrichment alternatives, which might be relevant for countries like the United States, yet irrelevant for the majority of public schools in Turkey. Therefore, that dimension was subsumed in our scale under the dimension asking about attitudes toward gifted students' academic needs. With these two considerations, the first version of the Educators' Attitudes toward Gifted Education Scale ended up having four subscales measuring the following dimensions of the variable:

1. Degree to which educators perceive gifted students as a national treasure
2. Degree to which educators perceive gifted education as an elitist practice
3. Degree to which educators believe that gifted students have different academic needs
4. Degree to which educators believe that gifted students have different social/emotional characteristics and needs.

After a careful examination of the literature review above, one can conclude that all dimensions in previously developed scales have been reflected in our scale either 'as is' or in a generalized form. The only exception might be the 'self-perceptions as gifted' dimension in McCoach and Siegle's (2007) article, which, we believe, is not a dimension of the construct of attitudes toward gifted education, yet a predictor of attitudes.

Thinking that there might be research published in Turkish that suggests dimensions of attitudes that are unique to Turkey, we also examined the literature in Turkish. We did not come across any publications in Turkish on the development of an instrument intended to measure teachers' or educators' attitudes toward gifted students or gifted education.

After reviewing the literature, we formed two separate focus groups with a number of educators employed in the schools/institutions where we later collected our data. These educators were the ones who volunteered to spend the extra time needed for the focus group. In the first focus group, we asked participants' opinions on possible additional dimensions of the construct, and received no suggestions for additional dimensions. We also asked the same educators to provide items for the dimensions we have identified. Once these items were gathered, we evaluated the items in terms of the truthfulness of expressions in these items about gifted students' characteristics and needs. We also assessed them in terms of principles of measurement and scale development. After eliminating some of the items written by these educators, we wrote items to reach a sufficient number of items. We, then, held the second focus group with another group of educators. After introducing the purpose of the whole study in general, and of the focus group in particular, the structure of the scale, i.e., the four subscales and the items for each, was explained. Then, each item was discussed in terms of whether the participants understood what it was intended to mean and whether the item measured the dimension it was supposed to measure. By either deleting or rewording the items based on the feedback received in this focus group, the first version of the scale was finalized.

Focus groups can be used for a variety of research purposes (Morgan, 1997). When combined with other methods, it can also be used for scale development (Morgan, 1997; Vogt, King, & King, 2004). More specifically, one can find in the literature examples of how focus groups have been used for developing scales (e.g., Wolff, Knodel, & Sittitrai, 1993), improving scales (e.g., O'Brien, 1993), and adapting scales to new populations (e.g., Fuller, Edwards, Vorakitphokatorn, & Sermsri, 1993). However, combining focus groups with other methods for the purpose of scale development has been limited (Vogt et al., 2004). In this respect, the present study can be seen as a rare example of this practice.

In the first version of the scale, there were 24 items with six items for each of the four subscales. All items were on a Likert scale, with five choices ranging from 'strongly disagree' (coded as 1) to 'strongly agree' (coded as 5). To avoid response patterns, 14 items were positively worded and 10 were negatively worded. Sequencing of items was mixed; that is, items measuring the same dimension were not located in the scale one after another. Negatively worded items were also interspersed throughout the scale.

Data Collection

Data were collected from educators of preschool through university who were employed in various schools or educational institutions in Istanbul, Turkey during the 2011-2012 school year. The term 'educator' was used to include teachers as well as other school personnel in various capacities such as school counselors and administrators. To maintain anonymity, respondents were asked not to put any personally identifiable information on the scale. Whenever possible, we went to the schools and administered the scale to the educators in person during staff meetings. When it was not an option, we provided copies of the scale to the school administrators, and the administrators administered the scale to their staff. As a result, a total of 421 educators filled out the scale. After a listwise deletion of cases with missing data on any of the 24 items on the scale, there were 360 cases left. Table 1 shows descriptive statistics based on these 360 cases. Finally, the average teaching/school services experience of respondents was 10 years with a standard deviation of 9 years (min=0; max=43; n=353).

Splitting the Sample for Exploratory and Confirmatory Factor Analyses

In the present study, data obtained in only one round of data collection have been split randomly between the exploratory and the confirmatory factor analyses. In other words, the total of 360 cases with no missing data on the items of the scale was split into two halves randomly. Exploratory factor analysis was performed on one set of 180 cases; while confirmatory factor analysis was performed on the other set of 180 cases. Wegener and Fabrigar (2000) state that one could do EFA and CFA within the same program of research, and "…a large sample could be split and an EFA conducted on half of the sample, with a CFA conducted on the other half" (p. 419). When another round of data collection from the same population is difficult, keeping the sample size large in the first round for the purpose of using the data for both EFA and CFA might save time and resources. Especially when the results of EFA might not necessitate rewording the existing items of the scale or addition of new items, but just deleting some of the existing ones, the second

half of the data to be used in CFA will include data on all items of the revised scale. This practice will accomplish the intended goal of cross-validating the final version of the scale under study, since the two halves of the data will serve as two separate datasets from two different samples of the same population. Therefore, the researcher will have tested the factor structure shaped through EFA on one sample by performing a CFA on a second, independent sample.

To this end, 360 cases with no missing data on the items of the scale were split randomly using the Select Cases feature in SPSS 19.0 (SPSS Inc., 2010) and the two halves were saved as two separate datasets. One was used for EFA; the other for CFA.

Table 1. Descriptive statistics (in percentages)

Gender			Education				
Male	Female	Missing	4-year	Master's	Doctoral	Other	Missing
38.3	61.4	.3	81.9	8.3	5.0	2.2	2.5

Position								
Elementary homeroom teacher	High school teacher	School counselor	Gifted teacher	Univ. faculty member	Special ed. teacher	School / district admin.	Other	Missing
38.6	13.6	1.7	.8	4.7	2.8	5.6	31.4	.8

Grade span							Type of school employed		
Preschool	Grades 1 thru 3	Grades 4 and 5	Grades 6 thru 8	Grades 9 thru 12	Univ. level	Missing	Public	Private	Missing
7.8	21.1	14.2	32.5	13.1	4.7	6.7	56.4	43.3	.3

Exploratory factor analysis. Before the analysis, responses to negatively worded items were reverse-coded so that higher scores indicated a more positive attitude for all items. As stated before, exploratory factor analysis was performed on 180 cases with no missing data on any of the 24 items in the scale. The sample size in this EFA was larger than the minimum of 5 respondents per variable (24x5=120) as suggested by Stevens (1996).

Exploratory factor analysis was performed using SPSS 19.0 (SPSS Inc., 2010). Bartlett's test of sphericity was run to see if the correlation matrix analyzed was appropriate for factor analysis. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which predicts whether the data are likely to factor well, was calculated. Principal components analysis was used as the extraction method. While there has long been a heated debate over the use of principal components analysis versus principal axis factoring as the appropriate factor extraction method in exploratory factor analysis (Thompson, 2004), both continue to be used by researchers (Henson & Roberts, 2006). Correlation matrix was analyzed. Following Fabrigar, Weneger, MacCallum, and Strahan's (1999) recommendation to run an oblique rotation even when the correlations among components are negligibly low, an oblique rotation (Promax with a Kappa of 4) was applied.

Confirmatory factor analysis. Once the final version of the scale was decided on the results of the exploratory factor analysis, confirmatory factor analysis was performed on the second half of the data split randomly. As was the case for the first half, this second half was made up of 180 cases with no missing data on any of the 24 items in the scale. Bentler and Chou (1987) recommend a minimum of five cases per model parameter to be estimated with the maximum likelihood method, which is the estimation method used in this analysis. A total of 36 parameters have been estimated in this confirmatory factor analysis performed on the final version of the scale made up of 15 items. Therefore, 180 cases in this analysis meet the recommended minimum sample size of 180 (36x5). Responses to negatively worded items in the final

version of the scale were reverse-coded before the analysis so that higher scores indicated a more positive attitude for all items (see Appendix for reverse-coded items in the final version of the scale).

SPSS 19.0 (SPSS Inc., 2010) was used to calculate the means and the standard deviations of items and the correlation matrix to be used in LISREL 8.80 (Jöreskog & Sörbom, 2007) to perform the confirmatory factor analysis. In the confirmatory factor analysis, covariance matrix was analyzed with the maximum likelihood estimation method. To resolve the scale indeterminacy problem of factors, the value of the loading of one reference variable per set of indicator variables (items) assigned to each factor was constrained to be 1.0 in the LISREL syntax (Byrne, 1998). As recommended by Byrne (1998), these reference variables in each set of items were the ones with the highest corrected item-total correlation in the reliability analyses performed in SPSS 19.0 (SPSS Inc., 2010). Correlations between the error terms of items were constrained to be zero, since there would not be any theoretically sound interpretations of these parameter estimates for the measurement model under study. All other parameters were free to take on any value in the estimation.

Reliability analysis. The internal consistency reliability coefficients (Cronbach's alphas) were calculated for each subscale as well as for the whole final version of the scale. This analysis was performed on the entire dataset of 360 cases, using SPSS 19.0 (SPSS Inc., 2010).

Results

Exploratory Factor Analysis

In the exploratory factor analysis on the original version of the scale, Bartlett's test of sphericity was significant (Approximate chi-square = 1366, $p< .001$), indicating that the correlation matrix analyzed was appropriate for factor analysis. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .821. According to Kaiser (1974), a KMO value of .821 is much more than satisfactory as a measure of factorability of the data. Using the 'eigenvalue greater than one' criterion and an oblique (Promax) rotation, the analysis with 180 cases on all 24 items generated seven components, explaining 61 % of the total variance. Then, each item was assessed in terms of the following criteria: 1) whether it has a loading of greater than or equal to .50 on the dimension it is intended to measure while having no loadings of greater than or equal to .50 on other dimensions (as an indicator of simple structure) 2) whether there are at least two other items that measure the same dimension and meet the first criterion above (as an indicator of strength and stability of extracted components, Costello & Osborne, 2005). The items which did not meet the above criteria were eliminated. In this way, nine items were removed from the scale and 15 were retained.

The same analysis was, then, rerun with these 15 well-behaved items (see Table 2 for factor loadings of items, eigenvalues of extracted components, and percentage of variance accounted for by each component in this second analysis). Bartlett's test of sphericity was significant (Approximate chi-square = 788, $p< .001$). Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was again .821 for this reduced dataset. Using the 'eigenvalue greater than one' criterion, this analysis yielded four components (same as the number of dimensions intended to be measured), explaining 60 % of the total variance in the reduced dataset. In other words, this second analysis with fewer items was as successful in explaining the variance in the dataset as the first one, indicating the parsimony of the revised scale. All the items had loadings of greater than or equal to .50 only on the dimensions they were intended to measure. In sum, simple structure was also achieved in this analysis. Finally, there were at least three items per component, indicating the strength and stability of extracted components. Please also note that the measurement model has to be overidentified for statistical tests assessing the goodness-of-fit between the model and data in confirmatory factor analysis. To obtain overidentification, statisticians recommend having at least three indicators per latent variable (Bollen, 1989). Therefore, it is important to have at least three items per component in the confirmatory factor analysis of the revised scale.

Table 2. Factor loadings of the well-behaved items with an oblique (Promax) rotation

Factor loadings (pattern matrix coefficients)				
Item	Component 1	Component 2	Component 3	Component 4
Item 9	.824*	-.011	.086	-.045
Item 5	.783*	-.031	.013	-.126
Item 21	.746*	.061	-.143	-.015
Item 17	.676*	-.100	.251	.079
Item 13	.575*	.098	-.146	.299
Item 15	-.132	.751*	-.275	.189
Item 23	.104	.749*	-.018	-.033
Item 3	-.012	.741*	.275	-.278
Item 7	.061	.683*	.126	.131
Item 14	-.085	-.097	.816*	.145
Item 22	.174	-.021	.633*	-.007
Item 10	-.088	.366	.598*	.051
Item 12	-.076	.068	.049	.799*
Item 16	-.083	-.174	.288	.742*
Item 8	.175	.130	-.096	.613*
Eigenvalues	4.644	1.725	1.374	1.213
Percent of explained var.	30.961	11.499	9.161	8.084

* Factor loadings over .50

Since an oblique rotation was performed, correlations among components were also calculated (see Table 3 for component correlation matrix). While all correlations among the four components were statistically significant (p<.01), the correlation coefficients between the component about educators' perceptions of gifted students as a national treasure and each of the other three components were higher than the remaining correlation coefficients.

Table 3. Component correlation matrix in EFA

	Component 1	Component 2	Component 3
Component 2	.35*		
Component 3	.33*	.24*	
Component 4	.40*	.22*	.22*

* Correlation is significant at the 0.01 level (2-tailed).

Confirmatory Factor Analysis

To begin with, obtained fit indices indicated that there was a relatively good fit between the hypothesized measurement model and the observed data. Among a large number of fit indices available, Sun (2005) suggests using Standardized Root Mean Square Residual (SRMR), Tucker-Lewis Index (TLI) which is the same as Non-normed Fit Index (NNFI), McDonald's Centrality Index (Mc), Root Mean Square Error of Approximation (RMSEA), and Comparative Fit Index (CFI) in a stand-alone evaluation of the model fit for the purpose of construct validity evaluation. LISREL 8.80 (Jöreskog & Sörbom, 2007) reports all of the above fit indices, except McDonald's Centrality Index. Hu and Bentler (1999) state that, when maximum likelihood is used as the estimation method, a value close to .08 for SRMR, a value close to .06 for RMSEA, and a value close to .95 for TLI (NNFI) and CFI are needed to conclude that there is a relatively good fit. Obtained values for all of the four indices mentioned above were quite close to the suggested cutoff criteria (SRMR=.08; RMSEA=.08; NNFI=.92; CFI=.93). Especially when values quite close to the cutoff criteria are observed for multiple indices (four indices in this case), it can be concluded with confidence that there is a good fit between the data and the model.

The magnitudes of factor loadings ranged from .29 to .88, and all were statistically significant at the .05 level (see Table 4 for completely standardized factor loadings).

Table 4. Completely standardized factor loadings in CFA

Factor	Item No.	Loading
1	9	.73*
	5	.61*
	21	.48*
	17	.75*
	13	.68*
2	15	.43*
	23	.45*
	3	.77*
	7	.88*
3	14	.87*
	22	.60*
	10	.29*
4	12	.55*
	16	.57*
	8	.63*

* Significant at the 0.05 level (2-tailed)

Correlations between factors were also estimated in the confirmatory factor analysis. All correlations among factors were statistically significant at the .05 level. They were even larger in confirmatory factor analysis than they were in exploratory factor analysis (see Table 5 for completely standardized factor correlations). With these magnitudes, all of the obtained correlation coefficients can be said to signify meaningful relationships.

Table 5. Completely standardized factor correlations in CFA

	Factor 1	Factor 2	Factor 3
Factor 2	.49*		
Factor 3	.66*	.50*	
Factor 4	.53*	.28*	.47*

* Correlation is significant at the 0.05 level (2-tailed).

Reliability Analysis

The internal consistency reliability coefficient (Cronbach's alpha) was .773 for the first subscale, .738 for the second subscale, .558 for the third subscale, and .621 for the fourth subscale. While two of the four reliability coefficients were above the most commonly used acceptability threshold of .70, one was .621, and another was .558. Cronbach's alpha for the whole scale was .823. Nunnally (1967) states that "In the early stages of research on predictor tests or hypothesized measures of a construct, one saves time and energy by working with instruments that have only modest reliability, for which purpose reliabilities of .60 or .50 will suffice" (p. 226). Admitting that this line of research is in an early stage, the reliability coefficients below .70 can be seen as acceptable in this study.

Discussion

The purpose of the present study was to develop a scale that measured educators' attitudes toward gifted education. Thus, the initial version of the scale was shaped by benefitting the literature and experience and/or expertise of educators at various levels. This initial version was finalized based on the results of the exploratory factor analysis. The final version was, then, cross-validated through confirmatory factor analysis. The internal consistency reliability of the whole scale as well as the subscales was also examined.

Regarding the factor analyses, the results were satisfactory in the sense that all intended dimensions were measured successfully by at least three items in the revised scale. The factor structure of the revised scale could also be cross-validated on a separate sample. This should be seen as an important accomplishment because factor structure of many measurement instruments obtained in exploratory factor analysis cannot be confirmed by confirmatory factor analysis in a subsequent study (Van Prooijen & Van Der Kloot, 2001). As for reliability, two of the four components reached the most commonly used acceptability threshold of .70. Remaining two coefficients which were below .70 (but above .55) were still acceptable for a line of research in its early stages as the present one (Nunnally, 1967).

The above statistical results should be evaluated in the light of two facts. First, the wording of the items was longer than that of many other scales having items made up of three or four words. Short items make it easier to reach desirable statistical results in terms of validity and reliability at the expense of not receiving thoughtful responses from the respondents. Second, the present scale had both negatively and positively worded items that avoided response patterns. Having all items worded in the same direction can result in response patterns where the respondent tends to give the same response to most – if not all – items without giving much thought, and this may generate artificially high measures of validity and/or reliability. Put differently, the present scale's ability to elicit high-quality responses from respondents was not sacrificed to artificially high measures of validity and/or reliability.

In scale development studies, researchers also use criterion-related validity as additional evidence for the validity of their scales. Whenever possible, this is accomplished through demonstrating high correlations between scores obtained from the scale under study and its well-established correlates, called criterion variables. Unfortunately, for the construct in the present study, we could not come across any criterion variables. In other words, we could not find any variables shown to consistently predict attitudes toward gifted education or to consistently have high correlation with it. On the contrary, Begin and Gagne (1994) examined 48 variables in terms of their success in predicting attitudes toward gifted education and concluded that "None of the 48 variables examined in these 35 studies has been shown to be a systematic and substantial predictor" (p. 169).

Even though there were no a priori hypotheses in this study about the strength of relationships between/among factors, the obtained correlations signal relationships that can be expected. An individual's opinions on the goals of education and on student rights might shape his/her attitudes toward gifted education and its dimensions measured by the scale developed in this study. In other words, these opinions might influence attitudes toward different aspects of gifted education in a common and consistent way, causing correlations between/among them. However, holistic and meaningful interpretation of relationships among the dimensions of educators' attitudes toward gifted education is only possible within a theoretical framework where the hypothesized relationships (including the mediating and/or moderating variables) between dimensions are spelled out and tested.

Conclusion

To conclude, this study has been successful in reaching its objectives. The developed scale has been shown to measure four dimensions of educators' attitudes toward gifted education. Substantively, this means that the present study provided at least an initial understanding that educators' attitudes toward gifted education should be conceived with at least four dimensions. It also showed that these dimensions can be differentiated from each other when it comes to their measurement.

Since this was a scale development study, generating and testing hypotheses about the nature of relationships between dimensions of attitudes toward gifted education or about this variable's relationship with some other variables was not aimed. On the other hand, the area of educators' attitudes toward gifted education holds much potential for future research. Following are four topics which beg for further research: 1) the relationships between dimensions of attitudes toward gifted education 2) the mechanisms through which these attitudes influence actual practices in education 3) the interaction among attitudes, actual practices, the demographic or cultural characteristics of educators, and the conditions in schools or other educational settings, and 4) stability of these attitudes over time or their potential for change through

educators' activities, such as attending professional development in gifted education. If gifted education is to improve in quality and also become available for those who need it, all of the above unknowns have to be investigated. Obviously, such research will have to be theory-based and holistic, trying to understand the big picture. For this purpose, more qualitative work will be needed – perhaps in the form of focus groups or interviews with educators – to understand the nature of the interaction among all the factors involved. Such qualitative work may lead to successful theorizations of relationships. Once formulations toward explaining these relationships are achieved, statistical testing of these formulations can be performed through advanced methods, such as structural equation modeling or hierarchical linear modeling.

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Appendix

Factors and Items Measuring These Factors

Note. To align this appendix with the tables in the text, the factors and items are listed in this appendix in the order they appear in Table 2, Table 3, Table 4, and Table 5. (R) at the end of an item indicates that the item was reverse-coded for statistical analysis. To show the mixed sequencing of items in the scale, original item numbers in the scale have been used below. The developed scale is in Turkish; below are the translations into English.

Factor 1 – Degree to Which Educators Perceive Gifted Students As a National Treasure

Item 9 Gifted students may play an important role in society's progress.

Item 5 Gifted students should be seen as national wealth for a country.

Item 21 It cannot be argued that gifted students will make more contribution to the society than will other students. (R)

Item 17 Gifted students are a valuable source of inventions and innovative ideas.

Item 13 Gifted students have the potential to provide solutions to the problems of the society.

Factor 2 – Degree to Which Educators Perceive Gifted Education As an Elitist Practice

Item 15 Practices differentiated for the gifted students create a priviliged group of students within the school. (R)

Item 23 Treating gifted students differently would hurt the feelings of equality and unity among students. (R)

Item 3 Programs for the gifted are the product of a discriminatory approach. (R)

Item 7 The "gifted student" definition is a type of discriminatory labeling. (R)

Factor 3 – Degree to Which Educators Believe That Gifted Students Have Different Academic Needs

Item 14 Ordinary classroom activities might not satisfy gifted students.

Item 22 Activities designed for students with average intelligence would create boredom in gifted students.

Item 10 Gifted students can also use their potential in a mainstream curriculum. (R)

Factor 4 – Degree to Which Educators Believe That Gifted Students Have Different Social/Emotional Characteristics and Needs

Item 12 It should not be forgotten that unjust practices would affect gifted students more.

Item 16 Gifted students' perceiving events differently and reacting to them differently should be treated with tolerance.

Item 8 It should be taken into account that gifted students exhibit a higher level of sensitivity to the events they encounter than do students with average intelligence.