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Development and Validation of the Ethics of Care Scale for Parents of Musically Gifted Children in Turkey

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Abstract

This study aimed to develop and validate the Ethics of Care Scale for Parents of Musically Gifted Children (ECS-MGC), grounded in Tronto's ethics of care, to assess caregiving behaviors of parents of musically gifted students enrolled in Turkey's Science and Art Centers (BİLSEM). Data were collected from 493 parents using a 5-point Likert-type questionnaire. Exploratory factor analysis based on a polychoric correlation matrix supported a five-factor structure, which was confirmed through confirmatory factor analysis using the WLSMV estimator. Item refinement yielded a 22-item scale comprising Caring About, Caring For, Care Giving, Care Receiving, and Caring With. Model comparisons indicated that the five-factor structure fit the data better than one-factor and higher-order alternatives. Reliability was supported by internal consistency, composite reliability, and test–retest coefficients. While four dimensions demonstrated strong reliability, Caring About showed lower yet acceptable reliability. Use of the ECS-MGC should be limited to similar BİLSEM parent populations.

Keywords

ethics of care, musically gifted students, validity, reliability, parental behaviors, scale development

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Introduction

Musically gifted children exhibit exceptional abilities in pitch discrimination, rhythmic precision, auditory memory, and perceptual sensitivity, typically placing them among the highest-performing ten percent of their age group (Marek-Schroer & Schroer, 1993; Weatherly & Liu, 2024). They often demonstrate advanced musical perception, strong intrinsic motivation, and expressive maturity even before their technical performance skills are fully developed (Buren et al., 2025; Dorhout, 1982). Accordingly, the identification of musical giftedness requires multidimensional assessment approaches that extend beyond standardized tests to include behavioral observations, parent and teacher input, peer evaluations, and measures of perception, creativity, and emotional engagement (Abramo & Natale-Abramo, 2020; Buren et al., 2025). Musical development thus emerges through the dynamic interaction of innate predispositions, sustained family support, and high-quality instruction (McPherson & Hallam, 2009), rendering musically gifted children particularly sensitive to the relational and emotional conditions under which learning unfolds. In this regard, developmental research shows that parents influence children's motivation, enjoyment, and emotional engagement from the earliest stages of instrumental development (McPherson, 2005, 2009; McPherson & Davidson, 2002).

Despite their accelerated progress, musically gifted children frequently experience heightened emotional sensitivity and increased vulnerability to perfectionism, stress, performance anxiety, and social isolation (López-Iniguez & McPherson, 2023; Moon & Hall, 1998; Voitova et al., 2025). At the same time, specialist music education contexts often prioritize polished performance outcomes and competitiveness, sometimes at the expense of learners' broader socioemotional needs (López-Iniguez & McPherson, 2025). Such performance-centered cultures may conflict with caregiving practices that are relationally attuned and emotionally responsive, which are essential for sustaining intrinsic motivation and psychological well-being over time (Elmgren, 2021; O'Neill, 2012). Within this ecology, parents play a central role in mediating these tensions by structuring daily practice routines, providing emotional reassurance, investing time and financial resources, and maintaining communication with teachers (Creech, 2010; Oliveira et al., 2021; Weatherly & Liu, 2024). Extending this view, parental involvement is conceptualized as a relational and reciprocal process through which supportive practice engagement enhances both skill acquisition and socio-emotional outcomes, including motivation, enjoyment, and mutual responsiveness (McPherson, 2009; McPherson & Davidson, 2002).

Recent music education research conceptualizes parental care as a relational, value-laden process involving empathy and shared agency in children's musical development (Dansereau, 2023; Hendricks et al., 2021; López-Iniguez & McPherson, 2023). However, this research has rarely been translated into theory-driven, phase-sensitive measurement frameworks. From this perspective, Tronto's (2013) ethics of care provides a critical analytical framework for examining parental caregiving not merely as involvement or support, but as an evolving moral and relational practice shaped by attentiveness, responsibility, responsiveness, and reciprocity under conditions of vulnerability. Importantly, positioning ethics of care in this way does not assume harmony between care and achievement; rather, it allows for critical examination of how care priorities may be

constrained, negotiated, or resisted within dominant gifted-education discourses that emphasize excellence, acceleration, and competition (López-Iniguez & McPherson, 2025; Raoof et al., 2024).

Research consistently demonstrates that parental involvement in music education is multidimensional and developmentally dynamic, shifting from directive guidance toward autonomy-supportive and self-regulation-oriented practices as children mature (Creech, 2010; McPherson & Hallam, 2009; Upitis et al., 2017). Developmental analyses indicate that sustaining long-term musical engagement requires a shift in parental roles from direct supervision toward supporting independence, self-regulated practice, and emotional resilience (McPherson, 2005, 2009). Family dynamics, cultural norms, and socioeconomic resources shape how caregiving is enacted and sustained (Kong, 2020; Nielsen et al., 2023; Weatherly & Liu, 2024), while collaboration between parents and teachers strengthens continuity across learning contexts (Creech, 2010; Haryono et al., 2018). Caregiving practices are shaped by educational, cultural, and policy contexts, rather than individual parenting orientations alone (López-Iniguez & Westerlund, 2023). Although autonomy-supportive and emotionally responsive parental involvement has been associated with motivation, resilience, and psychological adjustment across gifted populations (Garn et al., 2010; Morawska & Sanders, 2008; Penney & Wilgosh, 2000; Renati et al., 2017; Vialle, 2017), these findings largely derive from general gifted samples and do not fully capture the intensified relational, emotional, and ethical demands characteristic of musical giftedness.

Several instruments have been developed to examine parent–child dynamics in musical or gifted contexts, including the Music@Home Scale (Politimou et al., 2018), the Assessment of Parent–Child Interaction for Music Learning (APCI; Jacobsen & Stegemann, 2016), and other parental involvement measures designed for musically active or gifted populations (Jacobsen & Killen, 2015; Kuis et al., 2014). While these tools provide valuable insights into home musical environments and motivational climates, they primarily operationalize caregiving as discrete behaviors or environmental supports. As such, they offer limited capacity to capture caregiving as a morally grounded, relational, and sequential process that unfolds across different phases of musical development and requires simultaneous navigation of motivation, vulnerability, and responsibility (Buren et al., 2025).

Musically gifted children differ from other gifted groups in several important respects. They typically begin intensive training at early ages, engage in structured daily practice, and perform regularly in public contexts where errors are immediately visible, heightening vulnerability to psychosocial strain (Creech, 2010; McPherson & Hallam, 2009; Sloboda & Howe, 1991). Across developmental stages, performance-intensive musical learning places increased ethical and emotional demands on parents, whose caregiving practices contribute to children's motivation, well-being, and musical identity (McPherson, 2015). Instrumental instruction further creates a distinctive triadic relationship among teacher, parent, and child that demands sustained relational coordination not commonly observed in other gifted domains (López-Iniguez & McPherson, 2023). Within this ecology, parental caregiving functions not merely as support but as an ethically consequential practice that directly shapes children's motivation, well-being, and sense of belonging (Tronto, 2013).

Within the Turkish educational context, Science and Art Centers (BİLSEMs) constitute the primary institutional setting for educating musically gifted students, where performance-oriented training is accompanied by heightened parental involvement and examination-related pressures (Yıldırımer & Aksoy, 2025). Structural constraints within BİLSEMs, including limited instructional capacity and variability in resources, further intensify parental responsibilities in coordinating practice, supporting emotional regulation, and sustaining long-term educational planning (Yıldırımer & Aksoy, 2025). Despite the central role parents play in the development of musical talent in Turkey (Yapalı & Özal Göncü, 2025), parental caregiving within BİLSEM-based music education has not yet been examined through a theory-driven ethics of care framework capable of capturing its moral, relational, and behavioral dimensions. Addressing this clearly defined measurement gap provides the rationale for the development of a new scale designed to assess parental caregiving as an ethically grounded and relational process in musically gifted education.

The Purpose of the Study

Drawing on the theoretical framework and the gaps identified in the literature, this study sought to develop and validate a parent-report instrument for parents of musically gifted students enrolled in Turkey's BİLSEMs. The instrument was designed to operationalize and assess the five caregiving dimensions outlined in Tronto's (2013) ethics of care framework.

Method

Research Design

This study employed a survey design, one of the quantitative research methods. In survey studies, individuals or groups participating in the research are described within their natural conditions (Cohen & Manion, 1996; Fraenkel & Wallen, 2009).

Sample

Turkey provides an appropriate context for this study because the country offers structured support for musically gifted children while simultaneously presenting significant challenges. BİLSEMs operate nationwide and identify students with musical ability, providing supplementary instruction beyond regular schooling (Ministry of National Education [MoNE], 2024). In many towns and rural areas, traditional music retains cultural value and high performing children often receive social recognition. At the same time, students must navigate a general education system dominated by multiple choice examinations that strongly influence future academic opportunities (Yıldırımer & Aksoy, 2025). Families and media frequently prioritise academic success, which may limit the time available for musical practice. As supportive and restrictive forces coexist, the home environment becomes a decisive setting for whether musical talent is nurtured or constrained.

BİLSEMs are state funded institutions established for children identified in general ability, visual arts or music (MoNE, 2024, Art. 4). They function as supplementary learning environments rather than full day schools. Students remain enrolled in their regular schools and attend BİLSEM classes during afternoons or weekends. Instruction focuses on long term, ability aligned projects and encourages creative work without formal grading, with the primary aim of enabling students to explore their talents fully (MoNE, 2024, Art. 6).

The sample consisted of parents of students identified in music at BİLSEMs across Turkey. Student selection begins with teacher nominations in grades one to three, followed by assessments of auditory perception, musical memory and musical awareness (MoNE, 2024). After acceptance, students move through a structured model comprising five stages: Compliance, Support, Recognising Individual Skills, Developing Special Skills and Project Production and Management (MoNE, 2024, Art. 17). Students who sing or play an instrument typically advance to the Developing Special Skills stage, which may last up to seven school years depending on age at entry (MoNE, 2024, Art. 25). They then proceed to the Project Production stage, where instruction includes music theory, choir and instrumental performance. Students develop individual or group projects monitored throughout their progression, and upon completion receive a certificate from the Ministry (MoNE, 2024).

Data were collected during the spring term of the 2024 to 2025 academic year. A multi stage sampling strategy was used: the survey link was first distributed via the national BİLSEM music teachers' communication group (convenience sampling), followed by voluntary sharing within parent networks (snowball sampling). Participants self selected into the study and completed the survey voluntarily (Büyüköztürk et al., 2022). In total, 493 parents from 38 provinces participated: 32% from the Mediterranean, 28% Marmara, 14% Aegean, 12% Central Anatolia, 7% Black Sea, 4% Southeast, and 3% Eastern Anatolia. For scale development, a sample of 5–10 participants per item is recommended (Worthington & Whittaker, 2006); 300 is "good" and 500+ "very good" (Boateng et al., 2018). To strengthen the validity of the analyses, the complete dataset was randomly divided into two independent subsamples. The first, non-overlapping subsample ($N = 310$) was used for the Exploratory Factor Analysis (EFA), and the second independent subsample ($N = 183$) was used for the Confirmatory Factor Analysis (CFA). Test–retest reliability was examined using data from 115 parents who completed both the initial and follow-up administrations of the scale. The second administration was conducted four weeks after the first, and no attrition occurred between Time 1 and Time 2 (see Table 1).

In the EFA sample, 72% of the parents ($N = 223$) were mothers and 28% ($N = 87$) fathers. Regarding education levels, 1% had completed primary school, 1% middle school, 4% high school, 64% held a bachelor's degree, and 30% had a graduate degree. Their children had been enrolled in BİLSEM for 1–3 years (58%), 4–8 years (32%), or 9+ years (10%). In the CFA sample, 75% ($N = 137$) were mothers and 25% (n = 46) fathers. Educational backgrounds included 1% with middle school, 8% high school, 63% bachelor's, and 28% graduate degrees. These distributions indicate that the study draws on a highly educated and engaged parent population that is not representative of all parents of musically gifted children. Their children had been in BİLSEM for 1–3 years (69%),

Table 1. Study Groups and Statistical Methods Used

Study group	Scale applied	Statistical procedure conducted	
First study group	ECS-MGC	EFA for internal-structure evidence (exploration of dimensionality)	After combining data from the first and second groups, Cronbach's alpha reliability and item analysis were performed
Second study group	ECS-MGC	CFA for internal-structure evidence (confirmation of the proposed structure)	
Third study group	ECS-MGC	Test–retest reliability: Examining the correlation between the first and second administrations with participants who completed the form twice	

4–8 years (26%), or 9+ years (5%). Table 2 provides the key demographic characteristics of the children in the full sample.

Table 2 presents the key demographic characteristics of the total sample of 493 participants. The findings indicate that a majority of the children were enrolled in middle school, accounting for 58% of the sample, and that 61% of families identified their socioeconomic status as middle income. Piano was the most commonly played instrument at 35%, followed by string instruments at 31%. Additionally, more than half of the children, representing 55% of the sample, engaged in musical practice for four to 7 hours per week.

Procedure

The scale is based on Tronto's (2013) ethics of care theory. Tronto describes the ethics of care as a process comprising five distinct dimensions (see Figure 1).

The initial item pool was generated in line with Tronto's ethics of care framework, which conceptualizes care as comprising five components: recognising a need, assuming responsibility for care, providing care, receiving care and engaging in care with others (Tronto, 2013). These five components were defined as the target domains of the scale. To ensure relevance for parents of musically gifted children, we conducted a comprehensive review of the literature on parental involvement, caregiving practices and the everyday needs of musically gifted learners. On the basis of this theoretical and empirical groundwork, thirty-eight items were drafted, each capturing a coherent parental behavioural style across ethical, practical, and relational dimensions. Each item was then assigned to the care component to which it was judged to correspond conceptually. All items are agreement-based self-appraisals of parents' typical caregiving orientations. They do not assess the frequency of specific behaviors, and no uniform reference period is assumed unless explicitly specified in an item.

Content and face validity were ensured by ten experts (3 in measurement, 3 in gifted education and 4 in music education). Expert judgment ensured conceptual alignment and

Table 2. Key Demographic Characteristics of the Sample (N = 493)

Characteristic	Category	*n*	%
Child's grade level	Primary school (Grades 1-4)	74	15%
	Middle school (Grades 5-8)	286	58%
	High school (Grades 9-12)	133	27%
Parent-reported socioeconomic status (SES)	Low-to-middle income	118	24%
	Middle income	301	61%
	High income	74	15%
Primary instrument	Piano	173	35%
	String instruments (violin, etc.)	153	31%
	Guitar	89	18%
	Wind instruments/Other	78	16%
Weekly practice	1-3 hours	108	22%
	4-7 hours	271	55%
	8+ hours	114	23%

adequate representation of each subscale, essential for validating multidimensional instruments (Taherdoost, 2016; Zamanzadeh et al., 2015).

Each item was evaluated by experts using three categories: fits, needs revision or remove; in cases of expert disagreement, decisions were made based on majority

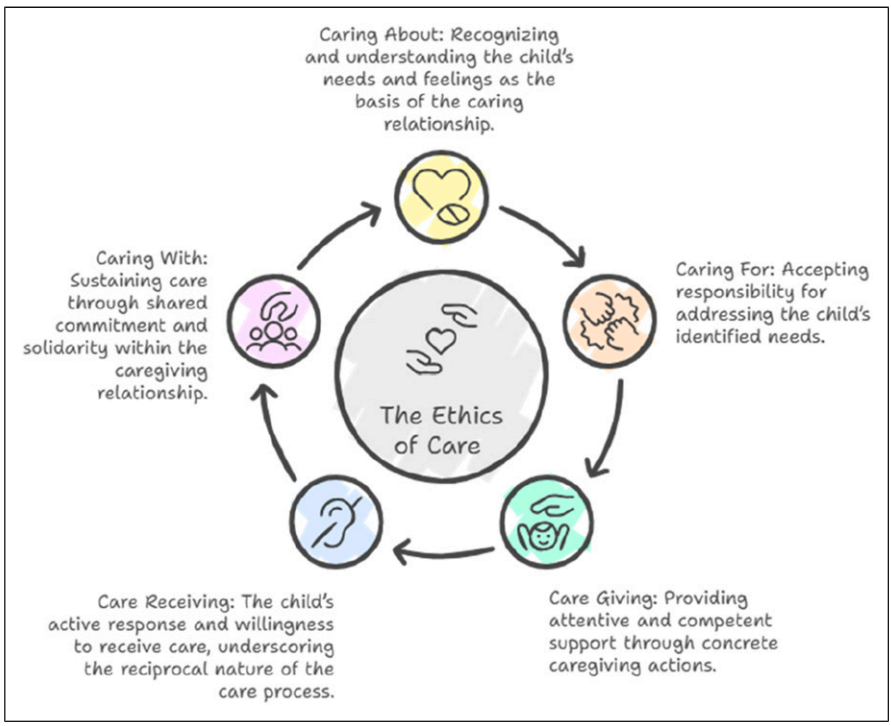

Figure 1. Dimensions of ethics of care

consensus and qualitative justification provided by the experts. The Item Content Validity Index (I-CVI) was calculated as the proportion of experts who rated the item as fits. Polit et al. (2007) recommend a minimum value of .78 for acceptable content validity, and items that scored below this threshold were removed. Final decisions were informed by both the numerical indices and the qualitative feedback provided by the experts. Items unanimously classified as fits were retained. Items for which several experts indicated remove, or for which comments pointed to substantial issues such as redundancy, were excluded even when their I-CVI values were slightly above the cutoff. Items rated as needs revision were rewritten according to the detailed recommendations provided by the experts. Following this evaluation, 3 items were removed. The remaining 35 items demonstrated strong content validity, with a mean I-CVI of .90 and a Scale Level CVI Average (S-CVI/Ave) of .92.

This 35-item pool, which included seven reverse-coded items intended to mitigate acquiescence bias (whose psychometric performance was carefully examined in subsequent analyses), was then vetted by two Turkish language experts for linguistic clarity and cultural appropriateness. The resulting draft, comprising five subdimensions derived from Tronto's theory, utilized a 5-point Likert scale for responses. A pilot study with 20 parents (mothers and fathers), each reporting on a different child enrolled in BİLSEMs, assessed item clarity and completion time (8–10 minutes). The sample included parents of primary (n = 6), middle (n = 8), and high school students (n = 6). Minor wording refinements were made based on feedback; no items were added or removed, and pilot data were excluded from the main analyses. Ethical approval (Approval No. E-19928322-108.01-539533) was obtained prior to the commencement of the main study, and data collected during the pilot phase were excluded from the final analyses. All data were stored securely, responses were collected anonymously, and no personally identifiable information was recorded.

Data Analysis

Descriptive statistics were analyzed using SPSS 25.0. For EFA, FACTOR 12 was used to compute a polychoric correlation matrix, which is preferred for ordinal Likert-type items as it better captures latent constructs (Holgado-Tello et al., 2010; Zumbo, 2007). Sample adequacy was evaluated using the Kaiser–Meyer–Olkin (KMO) measure. A significant Bartlett's Test of Sphericity ($p < .05$) indicated that the correlation matrix was factorable, while a KMO value above .90 is generally considered an excellent benchmark for conducting factor analysis (Hurley et al., 2022). To determine the number of factors, Parallel Analysis (PA) was employed. PA is considered one of the most reliable methods for factor retention, as it compares actual eigenvalues with those generated from random data sets. Unlike the traditional "eigenvalue > 1" rule, PA provides more accurate results and reduces the risk of over- or under-extraction (Ledesma & Valero-Mora, 2007). Especially in multidimensional scale development, PA plays a crucial role in establishing a valid factor structure. After determining the number of factors via PA, Promin rotation was applied to enhance interpretability.

CFA was conducted using Mplus 8 to confirm the factor structure identified in the EFA. Consistent with the ordinal nature of the data, the Weighted Least Squares Mean and Variance Adjusted (WLSMV) estimator was used for the analysis. This robust estimator is

specifically designed for categorical and ordered data, making it highly suitable for this study (Hair et al., 2019). All items in the online survey were required responses, and participants could proceed to the submission stage only after completing every question. This requirement was stated on the first screen, and participants provided consent before continuing. As no items were left unanswered, the final dataset contained complete responses for all variables, and no additional procedures were required to address missing data. Model fit indices including χ^2/df, CFI, TLI, RMSEA, and SRMR were calculated. Preliminary data screening indicated no substantial deviations from normality and no influential outliers in the dataset.

Model fit in the CFA was improved through a systematic examination of modification indices (MI) and standardized residuals. Items with MI values exceeding 10 or standardized residuals greater than |2.0| were treated as potentially problematic indicators (Brown, 2015; Kline, 2023). These criteria were used as pragmatic diagnostics to guide refinement, alongside theoretical coverage. Applying these criteria, several items were removed from the dataset to strengthen the overall model fit. However, some items flagged as statistically problematic were retained because they represent theoretically essential components of Tronto's ethics-of-care framework and maintained acceptable standardized factor loadings above .45. This decision reflects a deliberate balance between statistical optimization and the preservation of conceptual integrity. A complete list of items removed during the CFA, the criteria guiding their removal, and the implications for the final factor structure are presented in detail in Appendix A. After the removal of eleven items, the model demonstrated improved fit without the introduction of any artificial error covariances between item pairs.

Reliability analyses were performed in SPSS 25.0, including Cronbach's alpha, McDonald's omega, item-total correlations, and test–retest reliability. Based on CFA results, composite reliability was computed using standardized factor loadings (λ_i) and error variances (θ_i) in Excel (Fornell & Larcker, 1981; Hair et al., 2019). As a general guideline, internal consistency coefficients above .70 are considered acceptable, whereas values exceeding .80 indicate high reliability. Similarly, item–total correlations above .30 are widely regarded as evidence of adequate item discrimination (Field, 2024). For interpreting the magnitude of correlation coefficients, general effect size conventions were used: approximately .10 as small, .30 as medium and .50 as large (Cohen, 2013; Field, 2024).

Findings

This section presents the results of the EFA and CFA conducted on two independent sample groups.

Exploratory Factor Analysis (EFA)

An EFA was conducted with 310 parents to examine the internal structure of the scale. The suitability of the data for factor analysis was evaluated as good, as indicated by a KMO value of .868 and a significant result on Bartlett's Test of Sphericity ($\chi^2 = 7503.42, p < .01$, Table 3).

Table 3. KMO and Bartlett's Test of Sphericity

KMO measure of sampling adequacy		.868
Bartlett's test of sphericity	Approx. Chi-square	7503.42
	df	595
	Sig.	.000

PA and Promin rotation supported the theoretically expected five-factor structure. The Scree Plot (Figure 2) and the final factor structure (Figure 3) supported this solution. The five factors were labeled as follows: (1) Caring About, (2) Caring For, (3) Care Giving, (4) Care Receiving, and (5) Caring With.

EFA results are presented in Table 4. Consistent with common scale-development practice, factor loadings were evaluated using .40 as a pragmatic retention guideline (DeVellis & Thorpe, 2021; Field, 2024). I4 was removed due to a low loading and I13 was excluded for cross-loading, while I1 was retained as its loading difference exceeded .10 (Büyüköztürk, 2011). Across the five emergent factors, loadings ranged from .432 to .722. The total variance explained was 53.03%, providing internal-structure evidence consistent with a factor-analytically adequate solution (Hair et al., 2019). Individual factors explained 17.71%, 10.03%, 9.03%, 8.51%, and 7.75% of the variance.

Confirmatory Factor Analysis (CFA)

After the initial data screening, a second evaluation was conducted to determine whether the remaining 33 items continued to represent the five hypothesized factors. Two statistical

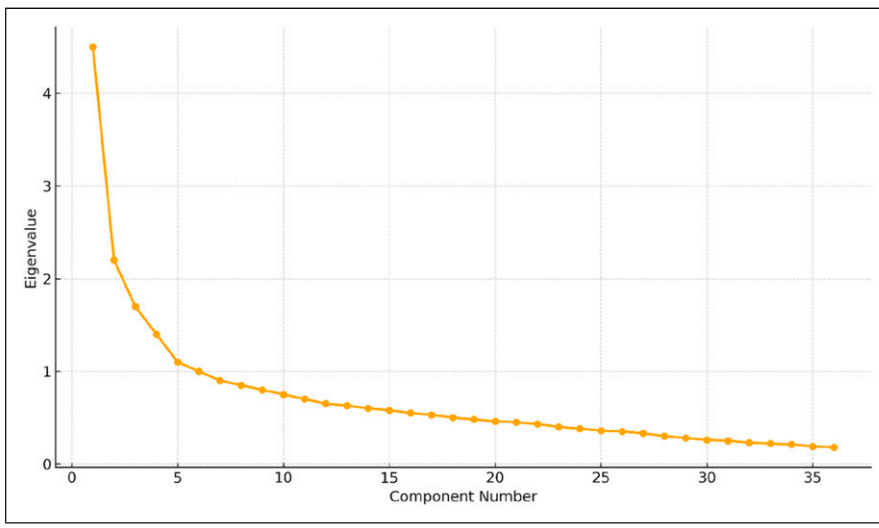

Figure 2. Scree plot of the scale

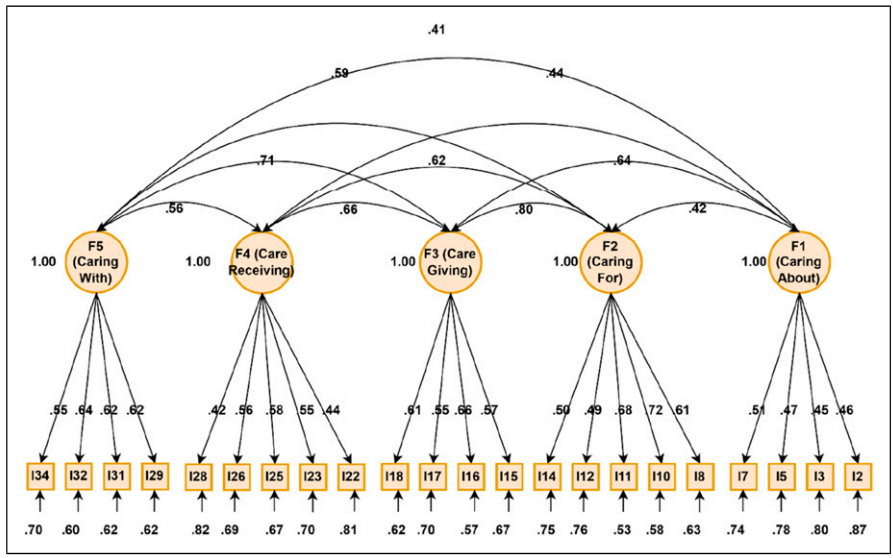

Figure 3. Confirmatory factor structure of the scale

criteria guided item removal. First, items associated with modification index values greater than 10 were considered to have error covariances that were excessively related. Second, items with standardized residuals exceeding an absolute value of 2.0 were identified as violating expected model patterns. Items meeting either of these criteria were classified as problematic.

Based on these criteria, item I1 was removed because its modification index exceeded 10. Subsequently, items I6, I9, I19, I20, I21, I24, I27, I30, I33 and I35 were removed because their standardized residuals surpassed the absolute value threshold of 2.0. No correlated error terms were added in the model, and improvements in model fit were achieved exclusively through item removal rather than through post hoc respecification.

Six of the seven reverse scored items (I6, I9, I19, I24, I33 and I35) were removed during this process. These items consistently demonstrated weak psychometric performance, including low factor loadings and high residual variances. Their removal improved the clarity of the factor structure. Such patterns may occur in factor analytic contexts, where reverse-coded items can introduce response inconsistencies that potentially attenuate factorial clarity. Only one reverse scored item, originally labelled I2 and now listed as the first item in Appendix B, demonstrated acceptable statistical properties and was retained. This item was preserved to provide a minimal safeguard against acquiescence bias.

The final model demonstrated acceptable fit to the data: χ^2 (276) = 435.757, χ^2/df = 1.57, CFI = .91, TLI = .90, RMSEA = .039 with a 90% confidence interval ranging from .028 to .049, and SRMR = .050. The RMSEA estimate and its confidence interval indicated low residual misfit in this sample, consistent with acceptable model fit

Table 4. EFA Results of the Scale

Items	1.Factor	2. Factor	3. Factor	4. Factor	5. Factor
I1	0.518			0.162	
I2	0.541				
I3	0.513				
I4	0.390				
I5	0.432				
I6	0.481				
I7	0.460				
I8		0.642			
I9		0.637			
I10		0.650			
I11		0.636			
I12		0.584			
I13		0.385			0.269
I14		0.503			
I15			0.728		
I16			0.691		
I17			0.662		
I18			0.592		
I19			0.441		
I20			0.527		
I21			0.564		
I22				0.670	
I23				0.620	
I24				0.572	
I25				0.642	
I26				0.648	
I27				0.422	
I28				0.548	
I29					0.641
I30					0.651
I31					0.666
I32					0.704
I33					0.722
I34					0.671
I35					0.662
Eigenvalues	6.20	1.84	1.80	1.58	1.45
Explained variance (%)	17.71	10.03	9.03	8.51	7.75

(Hu & Bentler, 1999). Taken together, these indices provide internal-structure evidence consistent with the plausibility of the correlated five-factor solution in this sample (Table 5). Appendix B presents the final set of 22 items and provides the corresponding item numbers from the exploratory factor analysis to allow readers to trace item retention and removal decisions.

Table 5. CFA Model Fit Indices for Final Model

Model index	Excellent fit range	Good fit range	Scale value	Fit level
x^2/sd	$0 < X^2/sd \leq 3$	$3 < X^2/sd \leq 5$	1.57	Excellent
CFI	1.00 ≥ CFI ≥ .95	.95 > CFI ≥. 90	.91	Good fit
TLI	1.00 ≥ TLI ≥ .95	.95 > TLI ≥ .90	.90	Good fit
RMSEA	.05 ≥ RMSEA ≥ .00	.08 ≥ RMSEA .05	.039	Excellent
RMSEA 90% CI	-	-	[.028–.049]	Excellent
SRMR	.05 ≥ SRMR ≥ 00	.10 ≥ SRMR > .05	.050	Excellent

Factor loadings ranged from .45 to .51 for Factor 1, .49 to .72 for Factor 2, .55 to .66 for Factor 3, .42 to .58 for Factor 4, and .55 to .62 for Factor 5. The CFA results and factor structure are illustrated in Figure 3.

To evaluate whether the ECS-MGC is best represented as five related subscales or as a more parsimonious global construct, we compared the correlated five-factor model (Model A) with a one-factor model (Model B) and a higher-order factor model (Model C). As shown in Table 6, Model B showed the weakest fit, with very low incremental fit indices (CFI = .71; TLI = .68) and elevated misfit (χ^2/df = 3.52; RMSEA = .082), indicating that caregiving practices cannot be adequately captured as a single undifferentiated dimension. Model C performed better than Model B but remained clearly weaker than Model A. Although Model C yielded RMSEA (.059) and SRMR (.056) values close to commonly cited acceptable ranges, its incremental fit indices (CFI = .85; TLI = .83) fell below the .90 benchmark, suggesting that a higher-order representation does not capture the covariance structure as well as the correlated five-factor solution. Taken together, these comparisons favored Model A as the most plausible representation of the covariance structure in this sample, relative to Models B and C.

The items retained through the confirmatory factor analysis correspond closely to the five components of care described by Tronto (2013). Items with high loadings on Factor 1 reflect parents' capacity to recognise the child's needs at both cognitive and emotional

Table 6. Comparison of Fit Indices for Competing Structural Models

Model	Description	$\chi 2/df$	CFI	TLI	RMSEA	SRMR	Model fit level
Model A	Five-factor model (Tronto's five phases of care)	1.57	0.91	0.90	0.039	0.050	Relatively better fit among tested models; retained for interpretation
Model B	One-factor model (All 22 items load onto a single factor)	3.52	0.71	0.68	0.082	0.068	Poorest-fitting model (clearly unacceptable incremental fit)
Model C	Higher-order factor model (five factors load onto one general factor)	2.32	0.85	0.83	0.059	0.056	Weaker than model A; marginal/borderline fit (RMSEA/SRMR near acceptable range, but CFI/TLI below .90)

levels. Items with high loadings on Factor 2 represent parents' assumption of responsibility for addressing those needs. Items with high loadings on Factor 3 capture the provision of direct and practical support. Items with high loadings on Factor 4 indicate parents' attention to the child's responses and their ability to adjust their actions accordingly. Items with high loadings on Factor 5 reflect collaborative engagement, in which parents and children participate jointly in caregiving processes. The alignment between the empirical factor structure and the theoretical framework suggests that the scale operationalizes ethics-of-care dimensions in a manner consistent with its conceptual foundations.

The standardized factor loadings for items I2, I3, I5, I22 and I28 were slightly above the established cutoff value. These items were retained because the ethics of care literature identifies them as conceptually essential to the construct. They were not removed from the scale, and Table 7 reports their standardized loadings together with the associated standard errors and R squared values. According to DeVellis and Thorpe (2021) and Field (2024), loadings above .40 are considered acceptable. The five items produced loadings ranging from .45 to .51, placing them at the lower end of the acceptable range. Nevertheless, they were preserved in the scale because they capture theoretically essential aspects of Tronto's ethics of care framework and contribute to maintaining the conceptual breadth of the construct rather than optimizing statistical fit alone (Table 7).

Reliability

Reliability was assessed using Cronbach's alpha and McDonald's omega internal consistency coefficients. Cronbach's alpha is the most widely used method in social sciences and provides an estimate of internal consistency, assuming equal covariances among items (Field, 2024). When this assumption is violated, McDonald's omega is recommended for composite measures (Dunn et al., 2014; Taherdoost, 2016). Coefficients above .70 are considered acceptable, and above .80 indicate high reliability. As shown in Table 8, Cronbach's alpha values were: Caring About = .73, Caring For = .89, Care Giving = .87, Care Receiving = .82, and Caring With = .88. Corresponding McDonald's omega values were: .70, .79, .77, .76, and .80, respectively. Test retest reliability was assessed by administering the scale twice over a four week interval. The two sets of scores showed high consistency. The reliability coefficient for the first factor, Caring About, was .82, and for the fifth factor, Caring With, it was .88. Table 8

Table 7. Items With Low Factor Loadings, Standard Errors, and R^2

Item	Factor	Load (λ)	*SE*	R^2
I2	Caring about (F1)	0.46	0.07	0.21
I3	Caring about (F1)	0.45	0.07	0.20
I5	Caring about (F1)	0.47	0.06	0.22
I22	Care receiving (F4)	0.44	0.07	0.19
I28	Care receiving (F4)	0.42	0.08	0.18

Table 8. Internal Consistency and Reliability Coefficients of the Factors

Factor	Cronbach alpha	McDonald omega	Test-retest coefficient	95% confidence interval (CI)
Caring about	.73	.70	.82	[.77 – .85]
Caring for	.89	.79	.85	[.80 – .88]
Care giving	.87	.77	.87	[.80 – .92]
Care receiving	.82	.76	.81	[.73 – .87]
Caring with	.88	.80	.88	[.82 – .92]

presents the test retest coefficients together with their 95% confidence intervals, which ranged from .73 to .87 for Factor 4, Care Receiving, and from .82 to .92 for Factor 5, Caring With. These results indicate that the scale produces stable scores across a four week period (see Table 8).

Validity

Convergent validity was assessed through the calculation of Composite Reliability (CR) and Average Variance Extracted (AVE). CR and AVE provide more reliable internal consistency measures by considering each item's individual contribution in confirmatory factor analysis (Hair et al., 2021). CR and AVE were used as heuristic indicators of convergent evidence (Fornell & Larcker, 1981). The CR values were .73 for Caring About, .85 for Caring For, .81 for Care Giving, .77 for Care Receiving, and .84 for Caring With.

In addition, AVE values were calculated as recommended by Fornell and Larcker (1981). AVE indicates how much variance in each factor's items is explained by the latent construct. AVE values were .55 (Caring About), .51 (Caring for), .58 (Care Giving), .53 (Care Receiving), and .59 (Caring With), providing convergent evidence in this sample. Across factors, CR and AVE values provided convergent evidence consistent with the expected measurement pattern, although Caring About showed comparatively weaker item strength. (Table 9). Importantly, these benchmarks were treated as flexible heuristics rather than rigid decision rules. In instances where statistical criteria and theoretical considerations diverged (e.g., the comparatively weaker but conceptually central Caring

Table 9. Composite Reliability (CR) and Average Variance Extracted (AVE)

Factor	CR	AVE
Caring about	.73	.55
Caring for	.85	.51
Care giving	.81	.58
Care receiving	.77	.53
Caring with	.84	.59

About factor), we prioritised preserving fidelity to Tronto's ethics-of-care framework while transparently reporting the associated psychometric limitations.

To evaluate whether the ECS-MGC subdimensions were empirically distinguishable, we first examined discriminant evidence using the Fornell–Larcker comparison. In this approach, each factor's AVE is compared with the squared correlation (r^2) it shares with other factors as a descriptive check of overlap. In the present analysis, this comparison was favorable for most factor pairs; however, one pair indicated comparatively higher overlap. Specifically, the AVE for Caring For was .51, whereas the squared correlation between Caring For and Care Giving was .64, indicating comparatively higher overlap between these two dimensions in this sample.

As a complementary check, we calculated the Heterotrait–Monotrait ratio (HTMT), which is widely used as a descriptive indicator of discriminant evidence in latent-variable models (Henseler et al., 2015). As shown in Table 10, HTMT values ranged from .70 to .79, remaining below commonly cited reference values (e.g., .85). Taken together, the HTMT pattern was generally consistent with discriminant evidence, while also indicating that Caring For and Care Giving were closely aligned in this sample (r = .80). We treat this proximity as substantively meaningful rather than as evidence of redundancy: in performance-intensive musical learning contexts, assuming responsibility (Caring For) and enacting support (Care Giving) may co-occur as adjacent phases of care in Tronto's sequence. Accordingly, both factors were retained as conceptually distinct yet naturally proximal components of the caregiving process.

Given the high CFA correlation between Caring For and Care Giving, a five-factor ESEM robustness check was conducted. The correlation decreased from .80 to .53 with adequate model fit (CFI = .918, TLI = .899, RMSEA = .071, SRMR = .075), indicating

Table 10. Fornell–Larcker and HTMT Values

Factor pair	AVE_1	AVE_2	r	r^2	AVE > r^2	HTMT
F1–F2	0.55	0.51	0.42	0.176	✓	0.76
F1–F3	0.55	0.58	0.62	0.384	✓	0.76
F1–F4	0.55	0.53	0.66	0.435	✓	0.70
F1–F5	0.55	0.59	0.59	0.348	✓	0.74
F2–F3	0.51	0.58	0.80	0.640	✗	0.79
F2–F4	0.51	0.53	0.64	0.409	✓	0.72
F2–F5	0.51	0.59	0.44	0.193	✓	0.77
F3–F4	0.58	0.53	0.62	0.384	✓	0.77
F3–F5	0.58	0.59	0.41	0.168	✓	0.76
F4–F5	0.53	0.59	0.71	0.504	✓	0.76

that the two dimensions are closely related yet empirically separable when cross-loadings are permitted.

Item Analysis

The results of the item level analyses were evaluated separately for each factor and are presented in Table 11. In these analyses, only the factor to which each item belonged was considered. Corrected item total correlations and Cronbach's alpha values with item deletion were calculated for each factor, and no overall analysis was conducted for the total scale.

All items clearly differentiated the upper 27% of respondents from the lower 27%, and all t values were sufficiently large to indicate meaningful discrimination. Item factor correlations ranged from .321 to .543, indicating that each item was adequately aligned with its respective factor. For every factor, the removal of any individual item either

Table 11. Item Analysis Results

	Cronbach's alpha if item deleted	Corrected item-total correlation	Mean	*SD*	*t*
Caring about (F1)					
I2	0.828	0.321	3.87	0.99	6.011*
I3	0.825	0.342	3.76	0.80	5.294*
I5	0.825	0.377	3.87	1.03	6.218*
I7	0.823	0.332	3.47	1.06	8.550*
Caring for (F2)					
I8	0.819	0.426	4.66	0.58	8.671*
I10	0.817	0.516	4.63	0.54	11.263*
I11	0.819	0.463	4.66	0.52	9.678*
I12	0.816	0.456	4.16	0.85	11.775*
I14	0.815	0.481	4.10	0.87	12.489*
Care giving (F3)					
I15	0.815	0.470	3.65	1.18	11.411*
I16	0.811	0.543	3.44	1.00	13.046*
I17	0.814	0.485	4.03	0.97	12.886*
I18	0.814	0.526	4.32	0.78	13.020*
Care receiving (F4)					
I22	0.822	0.323	3.94	0.80	7.295*
I23	0.816	0.467	4.13	0.79	10.532*
I25	0.820	0.383	4.36	0.64	8.187*
I26	0.819	0.395	3.94	0.83	8.956*
I28	0.824	0.384	3.77	0.66	7.058*
Caring with (F5)					
I29	0.817	0.443	4.22	0.83	10.539*
I31	0.816	0.453	4.06	0.98	10.862*
I32	0.817	0.474	4.50	0.65	9.725*
I34	0.820	0.384	3.95	0.99	9.511*

*$p < .01$.

reduced or did not improve the Cronbach's alpha value, demonstrating that no item increased internal consistency when removed. These findings collectively indicate that each item discriminates effectively between high and low scorers and fits well within its intended factor. The analyses consistently supported these results, with corrected item total correlations again ranging from .321 to .543.

Factor 1, Caring About, yielded a Cronbach's alpha of .73 (Table 8). If items I2, I3, I5 or I7 were removed, alpha values increased to a range between .823 and .828, suggesting lower internal homogeneity within this subscale. Their standardized factor loadings in the confirmatory factor analysis were also modest, ranging from .45 to .47. Nevertheless, these items were retained in the final scale because they capture parents' recognition and understanding of their children's emotions and challenges, which constitutes a core element of Tronto's (2013) Caring About ethic. Their inclusion preserves the theoretical comprehensiveness and conceptual integrity of the scale.

Scoring and Interpretation of the ECS-MGC

The ECS-MGC captures parents' agreement-based caregiving orientations rather than the frequency of discrete behaviors, and no uniform reference period is assumed unless explicitly specified in an item. The ECS-MGC assesses the ethical, practical, and relational qualities of parental caregiving toward musically gifted children, rather than the amount of support provided. Grounded in Tronto's ethics of care framework, the scale evaluates how parents recognize needs, assume responsibility, provide support, respond to the child's feedback, and engage collaboratively within the child's musical context.

Scores are calculated separately for each subscale by averaging the relevant items after recoding the single reverse scored item. Item 1 is reverse-scored and should be recoded prior to computing subscale means. Higher scores indicate stronger expression of the corresponding care ethical practice. A total score is not calculated, as the five dimensions represent distinct aspects of caregiving and are not intended to form a single global construct. Model comparisons (Table 6) indicated that the higher-order model represented the data less adequately than the correlated five-factor solution. Accordingly, ECS-MGC scores are best interpreted at the subscale level rather than as a single global score. For example, a parent scoring 4, 5, 3, and 4 on the four Caring About items (after reverse-coding Item 1) would obtain a subscale score of 4.00 by averaging these item responses.

Table 12. Inter-factor Correlation Coefficients

	F1	F2	F3	F4	F5
F1	1.00				
F2	0.42	1.00			
F3	0.62	0.80	1.00		
F4	0.66	0.64	0.62	1.00	
F5	0.59	0.44	0.41	0.71	1.00

F1 showed moderate positive correlations with other factors. F2 had a strong correlation with F3 and moderate with others. F3 correlated moderately with all. F4 and F5 showed a strong positive correlation (Table 12).

Interpretation should focus on patterns across subscales rather than cut off points. For example, high Care Giving combined with lower Care Receiving may indicate strong practical support with limited responsiveness to emotional cues. Consistent with model comparisons indicating that both the one-factor model and the higher-order model fit the data more weakly than the correlated five-factor model, ECS-MGC scores should be interpreted at the subscale level, reflecting the ethical, practical, and relational profile of parental caregiving.

Exploratory Analyses

Exploratory covariates (grade level, SES, primary instrument type, weekly practice intensity) were included to examine contextual variation in caregiving dimensions. Exploratory analyses showed that ECS-MGC scores were stable across children's grade levels, with no significant differences on any caregiving dimension ($Fs = 0.92–1.84$, $ps > .16$, $\eta^2 = .01–.02$). SES, however, yielded systematic variation: high-SES parents scored higher on Caring For and Care Giving than low-to-middle and middle-SES groups, $F_{(2, 490)} = 5.72$, $p = .003$, $\eta^2 = .05$, and $F_{(2, 490)} = 6.18$, $p = .002$, $\eta^2 = .06$, with smaller SES-related differences observed for Care Receiving and Caring With ($\eta^2 = .02–.03$). Primary instrument type did not differentiate caregiving scores ($Fs = 1.02–1.91$, $ps > .14$, $\eta^2 = .01–.02$). Weekly practice intensity showed clearer behavioural patterns: parents of children practicing eight or more hours per week scored higher on Caring With and Care Receiving than those practicing one to 3 hours, $F_{(2, 490)} = 4.88$, $p = .008$, $\eta^2 = .04$, and $F_{(2, 490)} = 5.11$, $p = .006$, $\eta^2 = .04$, with Caring For and Care Giving differences approaching significance ($ps = .06–.09$). Overall, caregiving practices appeared developmentally stable but varied meaningfully as a function of socioeconomic resources and children's musical engagement. These findings should be interpreted cautiously, as multiple comparisons were examined and the analyses are exploratory in nature. The reported associations are hypothesis-generating and descriptive rather than evidence of criterion-related validity. Accordingly, emphasis is placed on effect sizes (η^2) as indicators of practical magnitude, whereas p-values are reported primarily for completeness.

Discussion

The ECS-MGC yielded a five-factor structure consistent with Tronto's ethics of care framework, and factor-analytic findings provided internal-structure evidence supporting the plausibility of this configuration (Kline, 2023). The identified factors Caring About, Caring For, Care Giving, Care Receiving and Caring With collectively accounted for 53.03% of the total variance, indicating an adequate factor-analytic representation of the covariance structure among the items (Hair et al., 2019). In addition, the scale exhibited strong temporal stability, indicating that participants produced highly similar scores across administrations. This stability suggests that the ECS-MGC captures relatively enduring caregiving orientations rather than short-term mood states or situational fluctuations. Given that musically gifted students typically remain enrolled in BİLSEMs for extended periods, the ability of the scale to reflect stable caregiving patterns represents an important methodological strength.

Caring About showed comparatively weaker psychometric indicators (e.g., lower factor loadings), warranting cautious interpretation at the measurement level. However, model comparison analyses demonstrated that the correlated five-factor structure provided a substantially better fit than both single-factor and higher-order alternatives, supporting the conceptualization of parental caregiving as a set of related yet distinct dimensions rather than a unitary construct. Although the higher-order model showed lower residual misfit (RMSEA/SRMR), its incremental fit indices were weaker than those of the correlated five-factor solution, indicating that the five related subscales more adequately represent the covariance structure in this sample.

Moreover, the strong associations observed between Caring For and Care Giving, as well as between Care Receiving and Caring With, suggest that certain phases of care may be closely intertwined in everyday caregiving practices, particularly within performance-intensive educational contexts. These associations suggest that some care phases are closely intertwined in performance-intensive musical contexts (Dansereau, 2023; Hendricks et al., 2021; McPherson, 2005; McPherson & Davidson, 2002). Thus, despite acceptable discriminant validity, the Caring For–Care Giving proximity reflects context-specific overlap rather than construct redundancy. Consistent with this interpretation, the ESEM robustness check further supported that Caring For and Care Giving are closely related yet empirically distinct constructs.

Overall, the ECS-MGC yielded internal-structure evidence consistent with the plausibility of the proposed five-factor configuration, alongside promising but still preliminary psychometric results within this selective group of Turkish BİLSEM parents (Fraenkel et al., 2012). Accordingly, interpretations of ECS-MGC scores should be situated within the Turkish BİLSEM context and should not be generalized beyond similar populations without further validation.

Exploratory analyses indicated that caregiving practices were shaped by contextual and musical engagement variables rather than developmental stage. While no meaningful differences emerged across children's grade levels or primary instruments, socioeconomic status and weekly practice intensity were associated with variation across several caregiving dimensions. Higher-SES parents reported higher scores on Caring For and Care Giving, a pattern consistent with previous research suggesting that socioeconomic resources may facilitate sustained parental involvement in music education (Creech & Hallam, 2011; Davidson et al., 1996). Similarly, parents of children who practiced eight or more hours per week reported higher scores on Care Receiving and Caring With, aligning with evidence that intensive musical engagement often coincides with more reciprocal parent–child interaction (Creech, 2010). Observational studies indicate that intensive practice contexts heighten the importance of parental responsiveness to children's emotional cues, supporting motivation, enjoyment, and persistence over time (McPherson, 2009; McPherson & Davidson, 2002). These associations are correlational and should not be interpreted as causal, but they underscore the importance of situating caregiving practices within broader structural and engagement-related conditions. Consistent with a systems-oriented ethics-of-care perspective, such differences are better understood as reflections of unequal access to time, resources, and institutional support, rather than as indicators of parental commitment or sensitivity per se (López-Iniguez & Westerlund, 2023).

The Caring About factor assesses parents' awareness and sensitivity to their child's musical, emotional, and cognitive needs, corresponding to the initial phase of Tronto's (2013) care process. Although its factor loadings were lower than those of the other dimensions, this pattern reflects a deliberate methodological decision to preserve theoretical coherence rather than prioritize statistical optimization alone. Caring About represents the ethical foundation of care, and removing this dimension would have compromised the conceptual integrity of the scale. Notably, despite lower internal coherence, this subscale demonstrated strong temporal stability, indicating that it functions as a consistent indicator of parental attentiveness over time. Accordingly, Caring About remains theoretically central, although its psychometric properties indicate the need for further item refinement.

The remaining four factors demonstrated stronger psychometric performance. Caring For reflects parents' assumption of responsibility for addressing their child's needs, consistent with prior research linking parental responsibility to talent development (Oliveira et al., 2021; Vialle, 2017). Care Giving captures concrete forms of support, including emotional, financial, and time investments (Creech, 2010; Weatherly & Liu, 2024). Such enacted support operates through socio-emotional pathways that shape children's enjoyment of practice, emotional security, and persistence (McPherson, 2009, 2015; McPherson & Davidson, 2002).

Care Receiving reflects parental responsiveness to children's emotional and motivational cues, framing care as an inherently reciprocal, bidirectional, and adaptive process (McPherson, 2009, 2015; Moon & Hall, 1998; Voitova et al., 2025). This reciprocity echoes empirical work highlighting empathy, mutual responsiveness, and children's active participation as core elements of ethical musical interaction (Dansereau, 2023; Hendricks et al., 2021). Caring With, in turn, captures collaborative engagement with teachers, peers, and families, underscoring the distributed nature of musical talent development (Creech, 2010).

Although Caring For and Care Giving emerged as distinct dimensions, their strong association indicates that responsibility and action frequently co-occur in daily caregiving practices. This association reflects functional proximity rather than construct redundancy. Similar functional proximity has been documented, with parental organizational responsibility and direct practice engagement shown to be empirically difficult to disentangle during early and high-intensity learning phases (McPherson, 2005; McPherson & Davidson, 2002). A similar pattern was observed between Care Receiving and Caring With, suggesting that responsiveness to children's experiences often unfolds alongside collaborative engagement with others. Rather than contradicting Tronto's model, these patterns suggest that certain phases of care may be more integrated when enacted within close-knit family and cultural contexts, such as those characteristic of Turkey.

Implications

The ECS-MGC offers several potential but provisional applications for research and practice in musically gifted education. Given that the current evidence pertains primarily to internal structure, the scale should not be used for screening, diagnostic decisions, high-

stakes evaluation, or intervention outcome assessment. The ECS-MGC currently lacks sensitivity-to-change evidence, normative benchmarks, and criterion-related validity.

For parents, the ECS-MGC may function as a reflective framework rather than an evaluative instrument. For example, discrepancies between Care Giving and Care Receiving scores may prompt reflection on patterns of responsiveness and emotional attunement, without implying judgments about parenting quality or child outcomes.

For educators, music teachers, and counselors, the ECS-MGC may provide a conceptual lens for understanding family caregiving orientations when designing psychoeducational workshops or family-support initiatives. In such contexts, aggregate patterns—not individual scores—may help identify shared areas for dialogue, such as collaboration or responsiveness. Any pre–post use of the scale should be treated as descriptive rather than evidentiary, given the absence of sensitivity-to-change data.

At the policy level, aggregated ECS-MGC findings may offer descriptive insight into caregiving tendencies within specific institutional contexts, such as BİLSEMs. However, policy decisions should not rely on ECS-MGC data in isolation, and the scale should be viewed as complementary to broader qualitative and institutional evidence.

Conclusion

This study developed the ECS-MGC as a theoretically grounded instrument designed to assess parental caregiving toward musically gifted children through Tronto's ethics of care framework. The scale operationalizes five ethically and relationally grounded caregiving dimensions through which parents recognize needs, assume responsibility, provide support, attend to children's responses, and engage collaboratively with others.

The analyses provided internal-structure evidence consistent with a correlated five-factor configuration aligned with the theoretical model, and the scale demonstrated model fit patterns and reliability estimates that were interpretable and theoretically coherent within a Turkish BİLSEM parent sample.

Consistent with structural model comparisons, which favored the correlated five-factor solution over both single-factor and higher-order alternatives, the ECS-MGC should be interpreted at the subscale level rather than as a total score. Caring About was retained as theoretically central but psychometrically developing relative to the other dimensions, reflecting its foundational role within Tronto's ethics of care framework.

Taken together, the ECS-MGC provides initial evidence for a theoretically coherent and empirically testable approach to examining ethics-of-care-oriented parental practices in musically gifted education. These findings should be understood as a foundational step rather than a definitive validation, offering a basis for future refinement and cross-contextual research.

Limitations and Suggestions for Future Research

Several limitations should be acknowledged. First, the sample consisted exclusively of parents of children formally enrolled in Turkey's BİLSEM system, a group characterized by high engagement and educational attainment, limiting generalizability. Future research

should include more diverse samples and multi-informant designs incorporating child and teacher perspectives.

Second, the scale was developed within a specific cultural context. Cross-cultural validation is necessary to determine whether the five-factor structure reflects universal caregiving processes or culturally specific configurations.

Third, reliance on parental self-report introduces potential social desirability and self-enhancement bias. As no design features were used to directly control for this bias, it should be considered a limitation of the present study. Future research should employ multi-informant or mixed-method approaches to reduce common-method bias and enhance ecological validity.

Finally, the absence of criterion-related validity limits conclusions regarding the practical significance of ECS-MGC scores. Accordingly, future research should examine associations with external indicators, such as musical persistence, emotional well-being, parental stress, and child-reported experiences of care. Future research should also refine the Caring About items while preserving their theoretical coverage.

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Appendix

Appendix A: Item Reduction in the CFA Phase and Preservation of Theoretical Scope

Factor	Item number (EFA)	Item status (Post-EFA baseline)	Removal criterion (in CFA)	Final status (22 items)	Impact on theoretical coverage
Caring about (F1)	I1	Retained	MI >10	Removed	Coverage retained (4 items remained)
	I2, I3, I5, I7	Retained	Retained	Retained (4 items)	Theoretical core of F1 (emotional and cognitive attentiveness) retained
Caring for (F2)	I8, I10, I11, I12, I14	Retained	Retained	Retained (5 items)	Theoretical core of F2 (assuming responsibility) fully retained
	I9	Retained	Standardized residual >2.0	Removed	Coverage retained
Care giving (F3)	I15, I16, I17, I18	Retained	Retained	Retained (4 items)	Theoretical core of F3 (providing concrete support) retained
	I19, I20, I21	Retained	Standardized residual >2.0	Removed	Coverage retained
Care receiving (F4)	I22, I23, I25, I26, I28	Retained	Retained	Retained (5 items)	Theoretical core of F4 (attending to the child's response) fully retained
	I24, I27	Retained	Standardized residual >2.0	Removed	Coverage retained
Caring with (F5)	I29, I31, I32, I34	Retained	Retained	Retained (4 items)	Theoretical core of F5 (solidarity and collaboration) retained
	I30, I33, I35	Retained	Standardized residual >2.0	Removed	Coverage retained
Total items	35 (33 after EFA)		11 items removed	22 items	

Appendix B: ECS-MGC

Factor	Original item no. (from EFA)	No (final item no.)	Item (English)	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Caring about (F1)	I2	1	I struggle to understand my child's feelings during their musical activities. (*)					
	I3	2	I am aware of the types of music my child likes to play					
	I5	3	I recognize that my child wishes to express themself musically					
	I7	4	I can tell which sections of a musical piece are difficult for my child to play					

(continued)

(continued)

Factor	Original item no. (from EFA)	No (final item no.)	Item (English)	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Caring for (F2)	I8	5	I consider it my responsibility to provide the necessary resources for my child's music education					
	I10	6	I make it a priority to provide an environment for my child's regular music practice					
	I11	7	I make an effort to provide the financial support that music education requires					
	I12	8	It is my responsibility to re-motivate my child when their interest in music fades					
	I14	9	I feel responsible for ensuring that my child derives joy from their musical practice					

(continued)

(continued)

Factor	Original item no. (from EFA)	No (final item no.)	Item (English)	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Care giving (F3)	115	10	I do research to find a music teacher who is suitable for my child's level					
	116	11	I help my child find more effective methods for their music practice					
	117	12	I keep track of the maintenance and repair needs of my child's instrument					
	118	13	I encourage my child to attend a variety of musical activities for inspiration					

(continued)

(continued)

Factor	Original item no. (from EFA)	No (final item no.)	Item (English)	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Care receiving (F4)	I22	14	I try to notice if my support is making my child feel pressured					
	I23	15	I encourage my child to share their thoughts and feelings about their music teacher with me					
	I25	16	I am respectful when my child decides to change their goals related to music					
	I26	17	When my child doesn't want to practice, I try to understand the reason why					
	I28	18	I make sure to praise my child's effort after a performance, no matter what the result is					

(continued)

(continued)

Factor	Original item no. (from EFA)	No (final item no.)	Item (English)	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Caring with (F5)	I29	19	I encourage my child to learn by interacting with other music students					
	I31	20	I encourage other members of our family to support my child's musical journey					
	I32	21	I publicly stand up for the value and importance of music education					
	I34	22	I believe it is helpful for my child's music education to connect with other families on a similar journey					

*Reverse-scored.