Determining students' personality traits according to parental perspectives: A scale development study

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Abstract

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Keywords

student personality assessment, intelligence types, parent observation

Revisions

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Determining Students' Personality Traits According to Parental Perspectives: A Scale Development Study

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Abstract

The educational community recognizes individual differences, but it is important to fully address them in educational settings. While there are existing studies on personality traits, none focus on the personality traits of students aged 6-18. This study aims to fill this gap, as personality traits significantly influence personal, academic, and professional life. Understanding student personalities allows for the development of more effective educational programs, facilitating their full potential. The study included parents of 2,229 students from a population of 16,505,271 aged 6-18 in Turkiye. Through exploratory factor analysis (EFA), a reliable 61-item 5-point Likert scale ($\alpha = .942$) was derived. Confirmatory factor analysis (CFA) was performed on a second dataset of 916 parents, resulting in 794 due to outliers. The Scale for Determining Student Personalities According to Parental Perspectives, with 16 sub-dimensions and 46 items, demonstrated good reliability ($\alpha = .948$). The study's findings are expected to hold significant implications for education, parenting, and child development.

Keywords: student personality assessment, intelligence types, parent observation

Introduction

Educators emphasize recognizing individual uniqueness in the progressive education systems (Turgut et al., 2016). Unveiling this uniqueness requires understanding personality traits. Embracing differences is vital for societal harmony. Personality influences social interactions through behavioral patterns (Dilci, 2014). The COVID-19 pandemic since 2020 prompts consideration of variables like television, internet, and social media as potential character-shaping factors (Kazaz et al., 2022a; Kazaz et al., 2022b). Unique personality traits emerge in individuals exposed to various influences (see Appendix A).

According to Bleidorn et al. (2019), personality traits significantly impact personal and professional life. It is imperative for teachers and administrations to be cognizant of students' personalities to guide them toward desired behaviors (Kim et al., 2013). Identifying students is challenging (Lee et al., 2023) and time-consuming (Jolijn Hendriks et al., 2008). This leads to critical aspects of a student's character being overlooked. All stakeholders invest unnecessary resources.

Students need self-awareness for lifelong learning (Djebbari & Djebbari, 2018). Lack of self-awareness prevents recognizing potential or shortcomings, hindering goal-setting. This may lead to perceptions of student failure. it can result in dropouts, incurring additional costs. Student self-realization is a long-term educational goal (Ospanova et al., 2021). Collaboration is key in setting attainable objectives. Insight into students' personality traits allows teachers to address weaknesses and bolster strengths (Yildiz Durak, 2022).

The inability to apply the principle of relevance in schools is a challenge (Zeigler, 2008). Gardner (1999) stated that individuals learn diversely. Educators who understand this principle strive to understand their students preferred learning styles over time. However, they often end up creating individual lesson plans, study programs, and content based on quick observations, lacking a full understanding of their students (Mills, 1993). Identifying areas of intellectual strength in students can also be time-consuming (Hendriana et al., 2018). The literature review revealed a gap in scales for assessing students' personality traits utilizing the distinctive trait theory.

A survey distributed to parents will be employed to gather data on children's personality traits. This scale aims to evaluate students' actions and behaviors over extended periods without arousing suspicion or disrupting their routines. According to Staller and Kirschke (2021), parents, being the most familiar observers of their children, were chosen as the primary source of information regarding students' behaviors in this research. Certain studies suggest that questioning children or students may not always yield accurate responses, as social acceptance motivates them to maintain a specific image (Kreitchmann et al., 2019).

This study aims to swiftly discern student personality traits using an efficient method, saving time, money, and effort for all education stakeholders. Researchers posit that this scale is invaluable to the literature. The results will lead to increased self-awareness among students and closer connections between teacher and student, while parents, evaluating their children holistically, will heighten their awareness of their children.

This scale will provide insights into an individual's strengths and limitations. Teachers, parents, and students can then establish realistic goals, fostering a sense of accomplishment for students, and enabling educators and parents to support specific weaknesses. This research holds great importance for the benefit of students, parents, and teachers.

Unlike similar studies in the literature, this research encompasses all aspects of a child's behavior and personality. Alongside uncovering interests, talents, abilities, and strengths in social life, the data obtained from the scale can holistically determine an individual's personality needs. In this regard, it stands as a unique contribution to its field of study.

Literature Review

Personality traits have been a subject of study for many years, forming a well-established field of research. Various approaches have contributed valuable insights. However, criticisms have also emerged, particularly directed at certain methodological approaches.

Critics of the psychoanalytic approach, the first to attempt to explain personality, point out specific issues. Feist et al. (2021) criticized Freud's focus on men, his difficulty in understanding women, and the absence of gender equality in his explanations. In addition, there is criticism regarding the

constancy of libido in Freudian psychology, as well as its limitations in addressing various aspects of human experience, including abilities and disabilities, pleasures, emotions, social attitudes, friendships, attachments, conscious interests, and religious goals (Murray, 2008). Adler's theory also faced scrutiny, with critics noting the challenge of verifying present actions' connections to past experiences. Furthermore, Erikson's theory of personality is critiqued for its emphasis on subjectivity over empirical evidence (Feist et al., 2021).

The behavioral approach, another method used in the explanation of personality, falls short in elucidating the internal processes of the personality. Critics of personality theories rooted in behaviorism argue that not every emotion translates into behavior, and it fails to explain the underlying motivations for action. In contrast, there is a notable absence of substantial criticism in the literature regarding the cognitive and social cognitive, humanistic, and existential theories of personality.

According to Şimşek (2006), Allport played a significant role in shaping the trait approach and conducted pioneering studies. However, critics argue that Allport's theory lacks inclusion of children and disadvantaged individuals and is deficient in observational data (Feist et al., 2021). Regarding the Cattell 16 Personality Factor (PF) scale, the B reasoning/rational thinking factor, explaining intelligence, offers more nuanced insights for interpreting personality dimensions and predicting success. Nevertheless, Cattell and Schurger (2003) contended that the B factor should contain more questions to better understand intelligence. Various researchers have highlighted the impact of intelligence on the personality (Ali et al., 2021; Goff & Ackerman, 1992; Schore, 2019), emphasizing its significant role in the personality scale developed for this study.

Scales developed under the trait approach typically begin with collecting trait terms specific to the language and often involve an in-depth *ethnographic* analysis of culturally distinctive personality traits. Consequently, Western-based personality scales may not fully align with the dimensions of personality scales adapted to Eastern cultures (Deary & Ian, 2020). For instance, in studies conducted in China using the five-factor personality scale, the dimension of *openness to experience* is referred to as *optimism* or *self-awareness*, while in the Philippines, studies using the same scale reveal dimensions like *respect*, *restraint*, *perseverance*, *responsibility*, and *humility* (Haslam, 2007). Due to the absence of a universally agreed-upon concept of "personality," terms used by researchers to describe personality traits in their language may not comprehensively cover legitimate aspects of personality in a different cultural context.

The abundance of self-report scales used in personality assessment is a notable feature in the literature. Dunning et al. (2005) cautioned that the accuracy of data from self-report scales, especially those assessing expertise, character, personality, and ability, can be misleading. The same study underscored significant discrepancies between individuals' actual personalities and their perceived personality traits. This discrepancy could lead to misinterpretations of results by researchers, data analysts, and individuals. Given the emphasis on consistent behavior in most definitions of personality, Büyüköztürk et al. (2013) suggested assessing behaviors through observation. Fraenkel et al. (2012) recommended avoiding interference with the natural environment of the individual under observation, extending the observation period as long as possible, and conducting observations without the subject's awareness to ensure high consistency in evaluations. Therefore, parents were chosen as the data source for this research, recognizing that the scale's questions can encompass information from the students' birth to their current environment and reactions in various situations

(Costa & McCrae, 1988; Cüceloğlu, 2006; Keles & Ozkan, 2015; Kreitchmann et al., 2019; Topçu & Erdur Baker, 2016).

Methods

Researchers followed a systematic, incremental process in the development of the Students' Personality Traits Scale.

Study Group

According to the report presented by the Turkish Ministry of National Education (2020), Turkiye has 16,505,271 students aged 6 to 18, encompassing primary, secondary, and high school students. To avoid potential biases in data collected directly from students who may seek social acceptance and admiration, researchers directed the 5-point Likert scale questions to parents, who are best acquainted with the children (Costa & McCrae, 1988; Cüceloğlu, 2006; Keles & Ozkan, 2015; Kreitchmann et al., 2019; Topçu & Erdur Baker, 2016). Hence, the parents of these 16,505,271 students constitute the target population for our scale development study, which aimed to discern student characteristics influencing personality according to parental perspectives. Given the ongoing concerns of the COVID-19 pandemic, researchers opted for a sampling method to streamline the study's sample selection process (Büyüköztürk et al., 2013). Tavşancıl (2010) recommends a sample size of five to 10 times the number of items in the scale for scale development studies. Since the scale in this study comprised 185 items, researchers aimed to reach a minimum of 1850 parents. The 5-point Likert scale was distributed to parents with students in two primary schools, one secondary school, and one high school in the Sivas province using A4 printouts. To enhance sample size and, subsequently, reliability in qualitative research, researchers shared the Google Form link of the scale with parents via WhatsApp with the help of teachers in the same term (Tutar & Erdem, 2020). The criterion for inclusion in the study group was being a parent of a child between the ages of 6-18.

Data Collection Tool

Draft Scale for Determining Students' Personality Traits According to Parental Perspectives

In creating the draft scale, researchers began by thoroughly reviewing the literature on personality concepts and their measurement. The literature review revealed no previously validated and reliable scale existed in Turkiye for a comprehensive assessment of student personalities. The aim was to develop a tool that would empower teachers and families to provide more effective guidance to students in their education and life by understanding their personality traits.

Secondly, the literature review considered various dimensions and facets of personality. It encompassed an examination of 222 personality scales developed in Turkiye. Additionally, Demirutku and Orta's (2018) study provided a pool of adjectives related to personality and categorized them. Alongside these adjectives, the researchers considered the correlation between intelligence types and personality dimensions from studies (Argyle & Lu, 1990; Hooda et al., 2009; Yıldız, 2018). These intelligence types included emotional (Mayer & Salovey, 1993), verbal/linguistic, logical/mathematical, musical/rhythmic, bodily/kinesthetic, visual/spatial, interpersonal/social, personal/internal, and nature/existential (Gardner, 1999). This process led to a questionnaire comprising 356 items, designed to elicit behavior or information related to the

categories of adjectives, as per expert opinions. The questionnaire underwent further refinement based on the input of three language experts.

Subsequently, the researchers presented the 356-item scale to three university faculty members and incorporated their suggestions. This led to a reduction in the number of items to 185, streamlining questions with similar themes and considering expert opinions. Then, three language experts reviewed the revised 185-item 5-point Likert scale.

The application phase involved parents responding to items in the *Determining Students' Personality Traits According to Parental Perspectives* using a 5-point Likert-type rating scale from (1) strongly disagree to (5) strongly agree. The evaluation of responses was categorized as follows: strongly disagree = 1.00-1.79, slightly agree = 1.80-2.59, agree = 2.60-3.39, mostly agree = 3.40-4.19, and completely agree = 4.20-5.00.

The Scale for Determining Students' Personality Traits According to Parental Perspectives

Following the EFA in the initial phase of scale development, researchers reduced the draft from 185 to 61 items. The resulting 61-item 5-point Likert scale was designated as the *Scale of Determining Students' Personality Traits According to Parental Perspectives* and identified as the second data collection tool to be used in the CFA.

Data Source

In the first stage of data collection, the 5-point Likert scale was physically distributed to parents in two primary schools, one secondary school, and one high school in Sivas. To maximize sample size, the scale, now incorporated into Google Forms, was shared with parents via WhatsApp on May 2nd, during the spring term of the 2021-2022 academic year. Out of a total distribution of 2,750 parents, 521 scales were returned either blank or partially answered. Otherwise, 2,229 parents voluntarily filled out the scale. Table 1 provides demographic details of the children belonging to the 2,229 parents who fully responded to the *Draft Scale for Determining Student's Personality Traits According to Parental Perspectives* between May 2-30, marking the initial phase of data collection.

Table 1. Demographic Characteristics of 2,229 Participants (May 2-30)

Demographic Characteristic	N	%
Sex		
Girl	1,137	51.0
Boy	1,092	49.0
Age Group		
6-9	1,131	50.8
10-12	468	21.0
13-15	315	14.1
16-18	315	14.1
Total	**2,229**	**100.0**

In Table 1, 2,229 individuals participated in the initial phase of data collection for the study. Among these, 51% of 2,229 were parents of girls, while 49% were parents of boys. This indicates nearly equal representation in the data collected for the scale development study.

In the second stage of data collection, the 61-item 5-point Likert *Scale of Determining Students' Personality Traits According to Parental Perspectives*, derived from the EFA analysis, was

distributed to a different set of parents. Researchers devised questionnaires and disseminated them to parents in a distinct primary school, secondary school, and high school in Sivas, separate from those in the first stage. To maximize sample size, the link to the 5-point Likert scale, created in Google Forms, was shared with various parent groups via WhatsApp on July 5 during the spring term of the 2021-2022 academic year. Out of these, 84 parents returned the 61-item 5-point Likert scale either empty or partially answered, while 916 parents voluntarily completed the 5-point Likert scale. Like the first stage, the second phase of data collection met the target outlined by Tavşancıl (2010). Table 2 provides demographic details of the 916 parents who responded to the *Scale of Determining Students' Personality Traits According to Parental Perspectives* between July 5-30, constituting the second stage of data collection.

Table 2. Demographic Characteristics of 916 Participants (July 5-30)

Demographic Characteristic	*N*	*%*
Sex		
Girl	479	52.3
Boy	437	47.7
Age Group		
6-9	487	53.2
10-12	186	20.3
13-15	104	11.3
16-18	139	15.2
Total	**916**	**100.0**

Table 2 reveals that 916 parents with children aged 6-18 participated in the second phase of data collection prior to CFA. Among these, 52.3% were parents of daughters, and 47.7% were parents of sons. This indicates nearly equal gender representation related to the scale.

Analysis of Data

In the initial data collection phase, data gathered from 5-30 May was transferred to SPSS 26 for EFA. Items with a minimum load of .30 were included (Yaşlıoğlu, 2017). Overlapping items with at least .10 were considered, while those with low load were excluded. The EFA concluded with a reliability of .942. Cronbach Alpha was .948, with 16 sub-dimensions, and the 61-item *Scale of Determining Students' Personality Traits According to Parental Perspectives,* where the lowest item load exceeded .49.

In the second phase of data collection, information from 916 parents was transferred to Amos 24 for CFA. This involved the 61-item 5-point Likert scale named *Scale of Determining Students' Personality Traits According to Parental Perspectives,* collected between 5-30 July. Through the CFA process in Amos 24, data from 122 parents, deviating from normality, was excluded, resulting in a sample size of 794. Table 3 displays the demographic characteristics of 794 parents.

Table 3. Demographic Characteristics of 794 participants (July 5-30)

Demographic Characteristic	*N*	*%*
Sex		
Girl	416	52.4
Boy	378	47.6
Age Group		
6-9	424	53.4
10-12	162	20.4
13-15	84	10.6
16-18	124	15.6
Total	**794**	**100.0**

Analysis of Table 3 reveals that 52.4% of the 794 participating parents have daughters, while 47.6% have sons. this indicates almost equal gender representation in relation to the scale. The CFA analysis proceeded to assess the model's fit indices using the sample data from 794 parents.

Findings

Surface and Scope Validity

Validity refers to whether the measurement scale and rules used in the research are appropriate for the intended measurement, and whether the measurements align with the features being assessed (Büyüköztürk et al., 2013). Surface validity involves experts assessing whether a scale is capable of measuring the intended subject (Tavşancıl, 2010). After reducing the initial pool of 356 items to 185 items based on expert advice, researchers sought input from language experts. The resulting scale demonstrated both surface and content validity and was easily understood.

Construct Validity

In examining construct validity, which indirectly measures a feature, researchers opted for factor analysis (Büyüköztürk et al., 2013).. This approach aimed to reveal the factor structure of the scale. There are two types of factor analysis: EFA and CFA. In a scale development study, EFA should preceed CFA, as CFA is employed to confirm the factors identified in EFA (Yaşlıoğlu, 2017). An important point to note that the dataset used in EFA should not be employed in CFA;, a new dataset is required for CFA (Suhr, 2006).

Exploratory Factor Analysis

Table 4 presents the results of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test for a scale development study.

Table 4. KMO Sample Adequacy and Bartlett Sphericity Test Findings

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.94
Bartlett's Test of Sphericity	Approx Chi-Square ($\chi2$)	74,299.641
	Df	1,830
	$Sig.$	.000

The KMO value of .94 for the scale exceeds the accepted threshold of .80 in literature (Alpar, 2020). Indicating suitability for factor analysis, as suggested by Büyüköztürk and colleagues (2013). The *P* value (statistical significance level) of Bartlett's test of sphericity was determined as .000 ($p < .05$), Affirming the dataset's adequacy for factor analysis.

In EFA, the maximum number of sub-dimensions can be equal to the number of items, which contradicts the purpose of applying EFA. Hence, the eigenvalue criterion, the explained variance criterion, and the scree plot approach are commonly used (Alpar, 2017). Table 5 displays the eigenvalues and explained variances of the scale. According to the eigenvalue criterion, Table 5 reveals 16 sub-dimensions greater than 1 on the scale. In social sciences, where knowledge is less certain, it is argued that the explained variance should be at least 50% (Tavşancıl, 2010). Cumulatively, the variance of the scale surpasses 50% starting from the 7th sub-dimension. The 16 sub-dimensions, comprising 61 items, account for 69% of the total variance. Figure 1 illustrates the scree plot of the scale.

Table 5. Total Variance

| Component	Initial Eigenvalue			Extraction Sums of Squared Loading			Rotation Sums of Squared Loading		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	16.712	27.594	27.594	16.712	27.594	27.594	3.796	6.223	6.223
2	4.643	7.612	35.206	4.643	7.612	35.206	3.540	5.803	12.026
3	2.703	4.431	39.637	2.703	4.431	39.637	3.239	5.310	17.336
4	2.202	3.609	43.246	2.202	3.609	43.246	2.903	4.759	22.096
5	1.813	2.973	46.219	1.813	2.973	46.219	2.845	4.664	26.760
6	1.710	2.804	49.023	1.710	2.804	49.023	2.670	4.378	31.138
7	1.567	2.569	51.592	1.567	2.569	51.592	2.635	4.319	35.457
8	1.484	2.432	54.024	1.484	2.432	54.024	2.605	4.271	39.728
9	1.307	2.142	56.166	1.307	2.142	56.166	2.475	4.057	43.785
10	1.268	2.078	58.245	1.268	2.078	58.245	2.411	3.952	47.737
11	1.253	2.054	60.299	1.253	2.054	60.299	2.246	3.682	51.419
12	1.165	1.910	62.209	1.165	1.910	62.209	2.244	3.679	55.098
13	1.128	1.850	64.059	1.128	1.850	64.059	2.224	3.646	58.744
14	1.101	1.804	65.863	1.101	1.804	65.863	2.134	3.498	62.242
15	1.022	1.577	67.440	1.022	1.577	67.440	2.106	3.452	65.694
16	1.012	1.560	69.000	1.012	1.560	69.000	2.017	3.306	69.000

Figure 1. Scree Plot
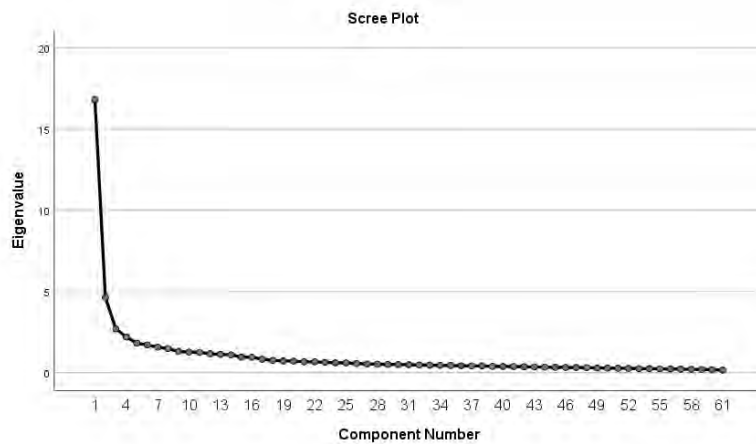
Figure 1 identifies a notable inflection point after the 5th sub-dimension in the eigenvalue scree plot. According to Velicer (1976), sub-dimensions with eigenvalues above 1 can be considered as factors, providing the researcher with some latitude in determining the number of factors (Zwick & Velicer, 1986).

To facilitate the interpretation of the results from the first-factor solution obtained by EFA, the factors were rotated for greater clarity. In this study, the widely used Varimax rotation method was considered appropriate (Alpar, 2017). Factor load values take into account the same size. According to Alpar (2020), a study with a sample size of at least 350 requires an acceptable factor load of .30 or higher, while for a sample size of at least 200, an acceptable factor load is .40 or higher, and for a sample size of at least 85, an acceptable factor load is .60 or higher. Thus, as the sample size decreases, the factor load criterion becomes more stringent.

In this study, with a sample size of 2,229, the factor load was determined as .30. Consequently, items below this value were successively removed during the EFA analysis. After the factor rotation process, load values for the items in the scale are detailed in Table 6.

Table 6 displays the factor load values for the 61 items. The first sub-dimension has six items. The second, fifth, eighth, and eleventh sub-dimensions each have five items. The third and twelfth sub-dimensions have four items, while the fourth, sixth, seventh, ninth, tenth, thirteenth, fourteenth, fifteenth, and sixteenth sub-dimensions comprise three items. Because of EFA, the Scale for Determining Students' Personality Traits According to Parental Perspectives emerged, comprising 16 sub-dimensions and 61 items, each named after its respective content: visionary, morality, self-confidence, logical/mathematical intelligence, bodily/kinesthetic intelligence, thought, egocentric, justice, communication, self-awareness, emotional intelligence, visual/spatial intelligence, nature/existential intelligence, musical/rhythmic intelligence, responsibility, and social/interpersonal intelligence.

In anticipation of transitioning to CFA, as advised by Suhr (2006), researchers collected new data to ensure independence from the dataset used in EFA. After redistributing the scale, the researchers obtained a sample group of 916 individuals. This data was then subjected to CFA in the Amos 24 program. Due to deviations from normality in the data of the 122 individuals, the sample group was reduced to 794 for the CFA analysis.

Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) is a statistical method used to validate the factor structure of observed variables. It assesses the hypothesis that a relationship exists between observed variables and their underlying latent structures. In CFA, researchers can utilize knowledge derived from theory, empirical research, or both, to formulate an initial relationship model and subsequently subject it to statistical hypothesis testing (Suhr, 2006). The sub-dimensions identified through EFA should be evaluated using CFA and multiple fit indices should be employed for model assessment (Tay & Jebb, 2017). With CFA, it is possible to examine many analytical possibilities not covered by EFA (Brown, 2015). The acceptable fit and good fit criteria for scale development studies are as follows:

- Chi-Square/Degree of Freedom ($\chi2/sd$) should be less than 2 for good fit and less than 5 for acceptable fit (Kline, 2005).
- Comparative Fit Index (CFI) should be equal to or higher than .95 for a good fit, and between .90 and .95 for acceptable fit (Şimşek, 2007).
- Normed Fit Index (NFI) should be equal to or higher than .95 for good fit, and between .90 and .95 for acceptable fit (Suhr, 2006).
- Non-Normed Fit Index (NNFI) or Tucker-Lewis Index (TLI) should be equal to or higher than .95 for good fit, and between .90 and .95 for acceptable fit. Additionally, for scales with fewer than 30 items, a threshold value of .80 is set, with higher results being more meaningful (Tay & Jebb, 2017; Yaşlıoğlu, 2017).
- Adjusted Goodness of Fit Index (AGFI) should be equal to or higher than .90 for good fit, and between .80 and .90 for acceptable fit (Segars & Grover, 1993).
- Root Mean Square Error of Approximation (RMSEA) values equal to or less than .08 indicate acceptable fit, while values equal to or less than .05 signify a perfect fit (Steiger, 2007; Tay & Jebb, 2017).
- For Root Mean Square Residuals (RMR) .080 indicates acceptable fit, and .05 denotes a perfect fit (Şimşek, 2007).

Table 6. Rotated Component Matrix

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M1	.75															
M2	.68															
M3	.65															
M4	.60															
M5	.51															
M6	.49															
M7		.81														
M8		.81														
M9		.79														
M10		.75														
M11		.75														
M12			.77													
M13			.75													
M14			.72													
M15			.62													
M16				.82												
M17				.81												
M18				.81												
M19					.75											
M20					.73											
M21					.72											
M22					.53											
M23					.51											
M24						.77										
M25						.77										
M26						.66										
M27							.78									
M28							.76									
M29							.72									
M30								.75								
M31								.69								
M32								.69								
M33								.68								
M34								.63								
M35									.79							
M36									.77							
M37									.72							
M38										.76						
M39										.74						
M40										.71						
M41											.76					
M42											.67					
M43											.57					
M44											.38					
M45											.37					
M46												.79				
M47												.68				
M48												.67				
M49												.49				
M50													.78			
M51													.75			
M52													.73			
M53														.73		
M54														.70		
M55														.62		
M56															.76	
M57															.74	
M58															.66	
M59																.67
M60																.58
M61																.56

Table 7 displays fit indices and corresponding good fit and acceptable fit values, as well as the fit values obtained from the scale ($\chi2/sd$, CFI, NFI, NNFI/TLI, AGFI, RMSEA, and RMR) and interpretations based on predefined criteria.

Table 7. Model Fit Summary

Tested Model	Good Fit	Acceptable Fit	Obtained Value	Interpretation
$\chi2/sd$	$0 \leq \chi2/sd < 2$	$2 \leq \chi2/sd < 5$	4.615	Acceptable
CFI	$.95 \leq CFI < 1.00$	$.90 \leq CFI < .95$	.937	Acceptable
NFI	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI \leq .95$	.921	Acceptable
NNFI/TLI	$.95 \leq TLI < 1.00$	$.90 \leq TLI < .95$	.925	Acceptable
AGFI	$.90 \leq AGFI < 1.00$	$.85 \leq AGFI < .90$	.86	Acceptable
RMSEA	$0 \leq RMSEA < .05$	$.05 \leq RMSEA < .08$	.052	Acceptable
RMR	$0 \leq RMR < .05$	$.05 \leq RMR < .08$	.043	Good fit

The CFA results for the Scale for Determining Students' Personality Traits According to Parents' Views are as follows: $\chi2/sd$ (4.615), CFI (.937), NFI (.921), NNFI/TLI (.925), AGFI (.86), and RMSEA (.052) values fall within acceptable ranges. Additionally, the RMR (.043) value indicates a good fit.

Conclusions

The researchers methodologically developed the Scale for Determining Students' Personality Traits According to Parental Perspectives. It comprises 16 sub-factors: visionary, moral, self-confidence, logical/mathematical intelligence, bodily/kinesthetic intelligence, thought, egocentric, justice, communication, self-awareness, emotional intelligence, visual/spatial intelligence, nature/existential intelligence, musical/rhythmic intelligence, responsibility, and social/interpersonal intelligence, totaling 46 items.

Sub-dimensions and the number of items measured for each sub-dimension were assessed as follows: Visionary (4), Moral (4), Confidence (4), Logical/Mathematical Intelligence (3), Bodily/Kinesthetic Intelligence (3), Thought (3), Egocentric (2), Justice (3), Communication (3), Self-Awareness (3), Emotional Intelligence (3), Visual/Spatial Intelligence (2), Nature/Existential Intelligence (2), Musical/Rhythmic Intelligence (2), Responsibility (3), and Social/Interpersonal Intelligence (2).

The researchers wrote the scale in the present tense and used a 5-point Likert-type scoring system: 1 = Strongly Disagree, 2 = Agree Slightly, 3 = Agree, 4 = Agree Mostly, and 5 = Agree Strongly. Notably, the self-confidence sub-dimension is scored inversely, and the other sub-dimensions are scored normally. Scores on the scale range from a minimum of 46 to a maximum of 230.

The reliability analysis indicates a Cronbach's Alpha value of .948. Scale items exhibit factor loads ranging from .37 to .82. The CFA results are promising: $\chi2/sd$ (4.615), CFI (.937), NFI (.921), NNFI/TLI (.925), AGFI (.86), and RMSEA (.052) values are deemed acceptable, with RMR (.043) showing good agreement.

This affirms the Scale for Determining Students' Personality Traits According to Parental Perspectives as both valid and reliable. It fills a notable gap by providing a current, reliable, and valid measurement tool for a comprehensive evaluation of student personality traits in studies in Turkiye. The findings of this study are expected to have significant implications for education, parenting, and child development.

Implications

This research holds several implications. First, it sheds light on contextual factors that moderate student personality traits. Second, it draws from a wide-ranging population in Turkiye. Third, the practical applications of this research are pertinent for educators and parents seeking insight into students' personal traits. Understanding these traits helps teachers cultivate a productive classroom atmosphere (Yildiz Durak, 2022). For example, socially adept, self-aware, responsible, and confident students perform better in group work, while self-confident but less social students perform better in individual studies. Additionally, this study gives researchers detailed information on student learning styles and intelligence types, aiding educational practitioners in offering tailored guidance. For instance, students exhibiting high musical/rhythmic and visual/spatial intelligence excel in artistic pursuits (Lazarenko et al., 2019).

Limitations and Future Research

to the researchers acknowledge certain limitations of this study. First, the data focuses on parental perceptions of their children (ages 6-18) in Turkiye. Conducting similar studies in diverse geographic contexts would aid in generalizing the findings. Second, relying solely on data from students' parents is a constraint. Additionally, this research offers a snapshot in time, suggesting the potential benefit of a longitudinal survey. Access to an extra dataset for scale testing would be advantageous. There is anticipation that this study will stimulate future research.

References

Ali, R., Ullah Shah Bukhari, S. K., & Muhammed, S. (2021). The importance of IPIP five factor personality traits in prediction of university students' emotional intelligence. *Pakistan Social Sciences Review, 5*(2), 556–569. http://doi.org/10.35484/pssr.2021(5-II)44

Alpar, R. (2017). *Uygulamalı çok değişkenli istatistiksel yöntemler* [Applied multivariate statistical methods]. Detay.

Alpar, R. (2020). *Spor, sağlık ve eğitim bilimlerinden örneklerle uygulamalı istatistik ve geçerlik—güvenirlik* [Applied statistics and validity and reliability with examples from sports, health and educational sciences] (6th ed.). Detay.

Argyle, M., & Lu, L. (1990). Happiness and social skills. *Personality and Individual Differences, 11*(12), 1255–1261. http://doi.org/10.1016/0191-8869(90)90152-H

Bleidorn, W., Hill, P. L., Back, M. D., Denissen, J. J. A., Hennecke, M., Hopwood, C. J., Jokela, M., Kandler, C., Lucas, R. E., Luhmann, M., Orth, U., Wagner, J., Wrzus, C., Zimmermann, J., & Roberts, B. (2019). The policy relevance of personality traits. *American Psychologist, 74*(9), 1056–1067. http://doi.org/10.1037/amp0000503

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2013). *Bilimsel araştırma yöntemleri* [Scientific research methods]. Pegem Akademi.

Cattell, H. E. P., & Schuerger, J. M. (2003). *Essentials of 16PF assessment*. John Wiley & Sons.

Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: A six-year longitudinal study of self-reports and spouse ratings on the NEO personality inventory. *Journal of Personality and Social Psychology, 54*(5), 853–863. http://doi.org/10.1037/0022-3514.54.5.853

Cüceloğlu, D. (2006). *İnsan ve davranışı: Psikolojinin temel kavramları* [Man and his behavior: Basic concepts of psychology] (25th ed.). Remzi Kitabevi.

Deary, A. W., & Ian, J. (2020). The trait approach. In P. Corr, & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (pp. 31–43). Cambridge University.

Demirutku, K., & Orta, I. M. (2018). 359 Türkçe kişilik sıfatının beğenirlik değerlendirmeleri [Desirability ratings for 359 Turkish personality adjectives]. *Türk Psikoloji Yazıları, 21*(42), 89–104.

Dilci, T. (2014). *Çocuklarımızın karakterini inşa ederken* [While building our children's character]. Sertan.

Djebbari, Z., & Djebbari, M. H. (2018). Promoting innovation and change in English education: Towards a philosophy of lifelong learning. *International Journal of Linguistics, Literature & Translation, 1*(4), 8–11. http://meb.ai/NDWgud

Dunning, D., Heath, C., & Suls, J. M. (2005). Picture imperfect. *Scientific American, 16*(4), 20–27. http://doi.org/10.1038/scientificamericanmind1205-20

Feist, G. J., Roberts, T. A., & Feist, J. (2021). *Theories of personality* (10th ed.). McGraw Hill.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design research in education and evaluate*. McGraw Hill.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. Basic Books.

Goff, M., & Ackerman, P. (1992). Personality-intelligence relations: Assessment of typical intellectual engagement. *Journal of Educational Psychology, 84*(4), 537–552. http://doi.org/10.1037/0022-0663.84.4.537

Haslam, N. (2007). *Introduction to personality and intelligence*. SAGE Foundation of Psychology Series.

Hendriana, H., Johanto, T., & Sumarmo, U. (2018). The role of problem-based learning to improve students' mathematical problem-solving ability and self confidence. *Journal on Mathematics Education, 9*(2), 291–299. http://doi.org/10.22342/jme.9.2.5394.291-300

Hooda, D., Sharma, N. R., & Yadava, A. (2009). Social intelligence as a predictor of positive psychological health. *Journal of the Indian Academy of Applied Psychology, 35*(1), 143–150. http://meb.ai/UDnvhXA

Jolijn Hendriks, A. A., Kuyper, H., Johan Offringa, G., & Van Der Werf, M. P. C. (2008). Assessing young adolescents' personality with the five-factor personality inventory. *Assessment, 15*(3), 304–316. http://doi.org/10.1177/1073191107313761

Kazaz, N., Dilci, T., & Ağlar, C. (2022a). Examining 8th graders' use of technology in the pandemic period. *Cypriot Journal of Education, 17*(1), 268–283. http://doi.org/10.18844/cjes.v17i1.6707

Kazaz, N., Dilci, T., & Karadaş, T. (2022b). Effects of digital media on education (meta-thematic analysis). *International Journal of Emerging Technologies in Learning, 17*(16), 222–242. http://doi.org/10.3991/ijet.v17i16.32181

Keles, H. N., & Ozkan, T. K. (2015). Relationship between organizational identification and whistleblowing. *Pressacademia, 2*(4), 498–506. http://meb.ai/UYqVmja

Kim, J., Lee, A., & Ryu, H. (2013). Personality and its effects on learning performance: Design guidelines for an adaptive e-learning system based on a user model. *International Journal of Industrial Ergonomics, 43*(5), 450–461. http://doi.org/10.1016/j.ergon.2013.03.001

Kline, R. (2005). *Principles and practice of structural equation modeling* (2nd ed.). Guilford.

Kreitchmann, R. S., Abad, F. J., Ponsoda, V., Nieto, M. D., & Morillo, D. (2019). Controlling for response biases in self-report scales: Forced-choice vs. psychometric modeling of Likert items. *Frontiers in Psychology, 10*(2309), 1–12. http://doi.org/10.3389/fpsyg.2019.02309

Lazarenko, N., Brovchak, L., & Starovoit, L. (2019). The development of musical intelligence in junior school children during the lessons of the artistic cycle. In V. Lubinka, A. Kaupuzs, & A. Strode (Eds.), *Society, integration, education: Proceedings of the international scientific conference* (Vol. 4, pp. 422-439). Rezekne. http://doi.org/10.17770/sie2019vol4.3999

Lee, J., Kobia, C., & Son, J. (2023). Improving global competence in classroom-based experiential learning activities. *Journal of Global Education and Research, 7*(2), 131–145. http://doi.org/10.5038/2577-509x.7.2.1116

Mayer, J. D., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence*, *17,* 433–442. https://doi.org/10.1016/0160-2896(93)90010-3

Mills, C. J. (1993). Personality, learning style and cognitive style profiles of mathematically talented students. *European Journal of High Ability, 4*(1), 70–85. http://doi.org/10.1080/0937445930040108

Murray, H. A. (2008). *Explorations in personality*. Oxford University.

Ospanova, B. A., Redlikh, S. M., & Sagdullaev, I. I. (2021). Acme-creative self-realization of the student in the educational process of the university. *Report and Opinion, 13*(8), 133–135. http://doi.org/10.7537/marsroj130821.05

Schore, A. N. (2019). *Right brain psychotherapy*. W. W. Norton & Company.

Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. *MIS Quarterly: Management Information Systems, 17*(4), 517–525. http://doi.org/10.2307/249590

Staller, T., & Kirschke, C. (2021). *Personality assessment with ID37*. Springer. http://doi.org/10.1007/978-3-030-53921-4

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual Differences, 42*(5), 893–898. http://doi.org/10.1016/j.paid.2006.09.017

Suhr, D. D. (2006). Exploratory and confirmatory factor analysis. In K. J. LeBouton (Eds.), *Proceedings of SAS users group international: 31 annual conference* (pp. 200–231). SAS. http://meb.ai/UMoeZQD

Şimşek, Ö. (2006). *İnsan dinamiği kişilik özelliklerinin incelenmesine yönelik ölçek geliştirme çalışması* [A scale development study of personality dynamics] [Master's thesis, Sakarya University]. Databases of National Thesis Center of the Council of Higher Education. http://meb.ai/bu6DGN

Şimşek, Ö. F. (2007). *Yapısal eşitlik modellemesine giriş-temel ilkeler ve LISREL uygulamaları* [Introduction to structural equation modeling: Fundamental principles and LISREL applications]. Ekinoks.

Tavşancıl, E. (2010). *Tutumların ölçülmesi ve SPSS ile veri analizi* [Measurement of attitudes and data analysis with SPSS]. Nobel.

Tay, L., & Jebb, A. (2017). Scale development. In S. Rogelberg (Ed.), *The Sage encyclopedia of industrial and organizational psychology* (2nd ed., pp. 1384–1385). Sage. http://meb.ai/UPuatWN

Topçu, Ç., & Erdur Baker, Ö. (2016). Zorbalığa uğrayan ergenlerin yardım alma davranışı ve yardım kaynakları [Help seeking behaviors of bullying victims and resources for help]. *Ege Eğitim Dergisi, 17*(1), 127–145. http://meb.ai/UI6QLvu

Turgut, Ü., Salar, R., Aksakallı, A., & Gürbüz, F. (2016). *Bireysel farklıkların öğretim sürecine yansımasına dair öğretmen görüşlerinin incelenmesi: Nitel bir araştırma* [Investigation of teachers' views about reflection on individual differences to teaching process: A qualitative study]. *Bayburt Eğitim Fakültesi Dergisi, 11*(2), 431–444. http://meb.ai/Uhbh26t

Turkish Ministry of National Education. (2020). *Milli eğitim istatistikleri örgün eğitim* [National education statistics for formal education]. Milli Eğitim Bakanlığı. http://meb.ai/A1ncgo

Tutar, H., & Erdem, A. (2020). *Örnekleriyle bilimsel araştırma yöntemleri ve SPSS uygulamaları* [Scientific research methods and SPSS applications with examples]. Seçkin.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*(3), 321–327. http://doi.org/10.1007/BF02293557

Yaşlıoğlu, M. M. (2017). Sosyal bilimlerde faktör analizi ve geçerlilik: Keşfedici ve doğrulayıcı faktör analizlerinin kullanılması [Factor analysis and validity in social sciences: Application of exploratory and confirmatory factor analyses]. *İstanbul Üniversitesi İşletme Fakültesi Dergisi, 46*, 74–85. http://meb.ai/XjvjEA

Yildiz Durak, H. (2022). Role of personality traits in collaborative group works at flipped classrooms. *Current Psychology, 42,* 13093–13113. http://doi.org/10.1007/s12144-022-02702-1

Yıldız, E. (2018). *Rehberlik ve psikolojik danışmanlık programı öğrencilerindeki empati, kişilik tipleri ve çoklu zeka türlerinin bazı değişkenler açısından incelenmesi* [Examining empathy, personality types and multiple intelligence types in guidance and psychological counseling program students in terms of some variables] [Master's thesis, Eastern Mediterrranean University]. Eastern Mediterranean University Institutional Repository. http://hdl.handle.net/11129/4754

Zeigler, D. (2008). Relevance in education. *Evolution: Education and Outreach, 1*(4), 517–519. http://doi.org/10.1007/s12052-008-0068-1

Zwick, W. R., & Velicer, W. F. (1986). Comparison of five rules for determining the number of components to retain. *Psychological Bulletin, 99*(3), 432–442. http://doi.org/10.1037/0033-2909.99.3.432

Appendices

Appendix A. List of 377 Personality Traits

Personality Trait	Self-esteem, emotional, romantic, thrifty, well-behaved, cautious, serious, calm, delicate, inactive, passive, wimpy, sullen, touchy, sluggish, insecure, reluctant, discouraged, cowardly, boring, unenthusiastic, sloppy, lethargic, naive, obedient, introverted, lazy, ineffective, unsuccessful, clumsy, deep, dull, faint, tense, lifeless, coy, dependent, stagnant, mute, unpretentious, incompetent, powerless, helpless, quiet, cold-blooded, self-conscious, unhurried, ordinary, carefree, shy, pensive, secretive, unexcited, insecure, effortless, docile. confident, lively, popular, relaxed, questioning, quick-witted, feminine/masculine, sad, cool, excited, arrogant, unpretentious, pretentious, arrogant, arrogant, mischievous, talkative, cunning, sarcastic, crazy, outspoken, playful, capricious talkative, carefree, delusional, agile, non-consensual, charming, constructive, effective, vigorous, active, attractive, shrewd, affectionate, lovable, interested, social, extroverted, affectionate, helpful, smiling, warm, sociable, cheerful humane, friendly, understanding, happy, cordial, fun, expressive, smiling, gentle, energetic, harmonious, agreeable, colorful, sympathetic, witty, lively, assertive, self-controlled, dedicated, realistic, controlled, compassionate, compassionate, obsessed, charitable, conscientious, altruistic, sensitive, well-mannered, moral, good, willing, mature, moderate, thoughtful, meticulous, perfectionist, traditional, prescriptive, benevolent, responsible, sane, attentive, modest, modest, orderly, punctual, modest, forgiving, compassionate, disciplined, characterful, noble, persistent, oppressive, strong, dignified, sincere, loyal, appreciative, natural, principled, strict, determined, respectable, balanced, authoritative, dominant, stubborn, faithful, conservative, headstrong, persuasive, durable, reliable, honest, respectful, loyal, good-hearted, just, moral, good-natured, decent, generous, optimistic, patient, logical, elegant, peaceful, consistent, trouble-free, stable, resistant, sincere, unstable, unhappy, imprudent, troubled, wasteful, undisciplined, callous, frivolous, childish, mismatched, insensitive, grouchy, dishonest, thoughtless, unworthy, disloyal, ill-mannered, disloyal, prejudiced, unprincipled, unwilling, lax, unconscious, excessive, aggressive, artificial, negligent, unreasonable, irresponsible, unreliable, depressed, emotional, pessimistic, uneasy, confused, worried, angry, indifferent, indecisive, careless, weary, lazy, disbelieving, carefree, non-resilient, fussy, disorganized, superficial, frail, pessimistic, restless, skeptical, jealous, anxious, impatient, suspicious, irritable, grieving, rebellious, angry, hurtful, capricious, joyless, vindictive, uncontrollable, delusional, quarrelsome , incompetent, cheeky, innovative, competitive, artistic, participatory, diverse, assertive, fearless, versatile, intellectual, rational, talented, unprejudiced, extraordinary, diligent, broad-minded, eager, dreamy, tolerant, modern, ambitious, open-minded, conscious, intelligent, positive, intelligent, sharp-witted, self-confident, cultured, cooperative, resourceful, creative, knowledgeable, hardworking, ambitious, successful, practical, innovative, courageous, adventurous, daring, flexible, competitive, enthusiastic, independent, enterprising, free, agile, original, open to change, innovative, enthusiastic, egoist, ignorant, indifferent, cheesy, negative, mindless, narrow-minded, sullen, grumpy, unkind, stingy, repulsive, vindictive, insidious, intolerant, unsympathetic, hurtful, selfish, uncivilized, ruthless, rude, unjust, disrespectful, uncultured, merciless, impudent, dishonest, unscrupulous, cruel, heartless, immoral, wicked, visionary, leader, planned, imaginative, leader, foresight, cold-blooded, guiding, sensitive, determined, flexible, contemporary, realistic, knowledgeable, investigative, innovative, constructive, adaptive, creative, collaborative, hardworking, emotionally intelligent, inspiring, crisis-managing, socially conscious, reasonable, open to innovations, able to experiment, open to new ideas, open to criticism, idealistic, civilized