A Comparative Analysis of Parental Perceptions of Gifted Children with and without Attention-Deficit/Hyperactivity Disorder

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Abstract: In the present study, the Conners' Parent Rating Scale-Revised Short Form responses of parents (N=61) of their gifted children diagnosed with ADHD were compared with those of parents (N=66) of gifted children aged 6-17 years in terms of total ADHD score, oppositional defiant behavior, cognitive problems-inattention and hyperactivity scores. The statistical analysis showed that parents of gifted children reported significantly lower levels of total ADHD, oppositional defiant behavior, cognitive problems-inattention and hyperactivity symptoms in their children compared to the ADHD symptoms observed in gifted children with ADHD. The results of the present study firstly indicate that the Turkish adaptation of the Conners' Parent Rating Scale-Revised Short Form is an accurate instrument to identify ADHD symptoms in gifted children. A comparison of the behavioral symptoms exhibited by gifted children and those diagnosed with ADHD has demonstrated that ADHD can be a valid and distinguishable diagnosis in the gifted population. The present study also reaffirmed the critical role of parents in observing, recognizing, and reporting their gifted children's ADHD symptoms.

Keyword: Twice Exceptionality

Introduction

Giftedness and attention-deficit/hyperactivity disorder (ADHD) can co-exist in some children, and ADHD is one of the most commonly diagnosed disorders in gifted children (Antshel et al., 2007). Children who are diagnosed with both their gifts and disabilities are termed as twice exceptional (Reis et al., 2014). ADHD is a prevalent childhood disorder characterized by developmentally inappropriate levels of activity, low frustration tolerance, restlessness, poor behavioral organization, inattentiveness, and difficulty in maintaining attention (American Psychiatric Association [APA], 2013). ADHD is a significant medical problem that can prevent people from performing their full potential. Treatment options are available; however, a precise diagnosis must first be established (Hartnett et al., 2004).

Individuals with ADHD exhibit typical deficits in various cognitive domains (Frazier et al., 2004). Nonetheless, there is an ongoing controversy concerning whether such cognitive abilities are equally affected individuals with ADHD and high intellectual capabilities (Antshel et al., 2007). In the field of educational research, few studies have directly investigated this issue (Cadenas et al., 2020; Mullet & Rinn, 2015). Recent studies have shown that the manifestation of ADHD symptoms is different in highly intelligent children than in typically developing children (Lin et al., 2023). Rommelse and her colleagues (2015) argued that an individual's cognitive profile in neurodevelopmental disorders might be moderated by their intelligence level. In other words, high levels of intelligence provide remarkable protection against the symptoms associated with ADHD and related cognitive issues. Individuals with a high intelligence quotient (IQ), both children and adults, show low levels of ADHD symptoms and a lower risk of cognitive deficits that are commonly observed in people with ADHD (Rommelse et al.,2016; Rommelse et al., 2017).

Milioni and her colleagues (2017) discussed that high intellectual capacity might compensate ADHD symptoms and cognitive deficits associated with it making the diagnosis of the disorder complicated. In some circumstances, impairment among gifted children will not manifest until later in childhood because, as the researchers stated, high intelligence levels may help gifted and ADHD children to manage their symptoms. Nevertheless, several studies have shown that gifted children with ADHD display a pattern of familial, cognitive, psychiatric, behavioral, and functional features consistent with the diagnosis of ADHD documented in children with average IQ. That is, some studies showed no significant difference between highly intelligent-ADHD children and typically developing-ADHD children in terms of the clinical features of ADHD, course of the disorder, outcomes, or response to treatment (Antshel et al., 2007, 2008, 2009; Cadenas et al., 2020; Rommelse et al., 2015). However, the extent to which cognitive skills may moderate the symptoms and cognitive issues associated with ADHD has not been well understood yet.

Moreover, gifted children may exhibit symptoms like those of ADHD without actually having the disorder (Hartnett et al., 2004; Silverman, 2012). So, identifying gifted children can be challenging due to the similarity of their symptoms to those of ADHD. Gifted children can acquire more knowledge, analyze information faster on several levels, have remarkable energy, and can often multitask (Aubry et al., 2021; Johnson et al., 2003; Webb & Latimer, 1993). Both groups, according to Webb and Latimer (1993), have high activity levels, behave without much deliberation, and have difficulties sticking to activities, paying attention, and following rules. Both groups face severe social challenges as well as academic underachievement (Leroux & Levitt-Perlman, 2000). Some of these gifted children's behaviors can be explained by asynchronous development (Silverman, 1997). In an undemanding classroom, gifted children's attention focused elsewhere because of boredom may appear to be inattention (Rommelse et al., 2017; Silverman, 2012; Web & Latimer, 1993). Dabrowski (1972) described giftedness as greater responsiveness to stimuli manifested by psychomotor, sensual, emotional (affective), imaginative, or intellectual excitability, or a combination. Therefore, a gifted individual's hyperactivity might stem from psychomotor excitability, and their inattention might stem from imaginative excitability, and these behaviors can be confused with ADHD symptoms. The overlap between the characteristics of giftedness and the symptom of ADHD makes the identification process of twice exceptionality difficult for professionals, parents, and teachers (Dare & Nowicki, 2015; Rinn & Reynolds, 2012).

The study of Neumeister and her colleagues (2013) showed that parents, especially the mothers, recognize their twice exceptional children's potential and hardships and take responsibility for professional assistance and special education services. In return, their children develop more realistic self-perceptions of their capabilities and become more motivated to be successful at school. So, it can be concluded that parental guidance plays a very important role in the academic success of their twice exceptional children. This result highlights the importance of parents' perceptions of their gifted children's ADHD symptoms because their perceptions of the disorder and their children's abilities have a direct impact on their subsequent help-seeking behaviors and on their children's well-being.

Additionally, early diagnosis of ADHD in gifted children is very important because the failure to diagnose ADHD in gifted children at an early age may impede them from receiving proper treatment (Antshel et al., 2007) and can put them at higher risk for impaired outcomes and long-term major negative consequences such as self-esteem issues, social problems, conflicts with authority figures, intense power struggles, sibling rivalry, and underachievement (Beljan et al., 2006; Mullet & Rinn, 2015). Overdiagnosis or misdiagnosis of children with ADHD when they are truly gifted can lead to

inappropriate treatment. Giving a correct diagnosis to children and adolescents with giftedness and ADHD will increase the possibility of receiving support needed for optimal development and achievement (Zytka, 2020). The importance of parental involvement in identifying ADHD in gifted children and providing access to necessary treatment and educational interventions should not be underestimated.

As previously stated, the manifestation of ADHD symptoms in gifted children may differ from those in typically developing children. The superior cognitive abilities of gifted children may protect them against the symptoms associated with ADHD and related cognitive issues. Additionally, parental awareness of their children's symptoms has been found to be critically important in seeking help, accessing treatment and educational opportunities, and ultimately leading to better outcomes for these children. This study aims to compare ratings of ADHD symptoms in gifted children with and without a diagnosis. The study will explore how high intelligence affects ADHD presentation and if gifted characteristics are similar in their ADHD symptom presentation. It will measure subjective perceptions and examine how parents recognize ADHD symptoms for their children. It will also examine how accurately parents recognize their children's ADHD symptoms. The findings of this study will provide insights into whether parents can distinguish the characteristics of giftedness from ADHD symptomology. This, in turn, will improve our understanding of the presentation of ADHD in gifted children.

The Present Study

The present study aimed to examine whether parents can accurately distinguish the presentation of ADHD symptoms from characteristics associated with giftedness, by comparing parent-reported symptom ratings of gifted children with and without an ADHD diagnosis. Although the ADHD diagnosis of one group of participants had already been assessed clinically, the use of a parent-rating scale in this study was not intended to confirm diagnosis. Rather, it aimed to examine whether parents of gifted children can accurately distinguish ADHD-related symptoms from behaviors associated with giftedness, given the well-documented overlap between these two profiles. The aim of this study was to investigate whether parents reported more or fewer ADHD symptoms on the Conners' Parent Rating Scale-Revised Short Form when their gifted children were diagnosed with ADHD. To the present study, the following research questions were investigated:

a. Is there a statistically significant difference in the Conners' Parent Rating Scale-Revised Short Form total scores between gifted children diagnosed with ADHD and gifted children without an ADHD diagnosis?

b. How do the scores obtained from parents' responses to the Conners' Parent Rating Scale–Revised Short Form across the three subscales (oppositional defiant behavior, cognitive problems–inattention, and hyperactivity) differ between gifted children with ADHD diagnosis and gifted children without an ADHD diagnosis?

Method

The present study adopted a quantitative research design to systematically explore ADHD-related behaviors among gifted children, both with and without an ADHD diagnosis. The primary objective was to compare behavioral symptoms across these groups to better understand the intersection of giftedness and ADHD. To achieve this aim, behavioral ratings of parents were utilized as a key data source, providing valuable insights into the children's everyday observable behaviors. The utilization of parental ratings facilitated an evaluation of both the total behavioral score and specific symptom

clusters, including oppositional defiant behaviors, cognitive problems-inattention and hyperactivity.

Participants

The number of participants included in the study was calculated using G-Power 3.1 software (Faul et al., 2009) to evaluate whether the independent sample t-test and MANOVA tests had sufficient statistical power. The power analysis indicates that, to detect a medium-sized difference between two groups at a 5% level of significance (α = .05) and with 80% power (1 − β = .80), there should be at least 51 participants in each group for the independent sample t-test analysis. Therefore, it is recommended that the total sample size should be at least 102 to ensure the study has sufficient statistical power. Furthermore, the MANOVA test required 24 participants in each group (48 for total group) when analyzing medium-to-large effect size of f^2(V) = 0.25 with the same significance level and power. The estimated Pillai's V corresponding to the assumed effect size was 0.20. This indicates a moderate multivariate effect.

In the present study, the sample consisted of parents of 61 gifted children with an ADHD diagnosis (Mage = 11.08; SD = 2.42; 75,4 % boys (n= 46); 24,6 % girls (n= 15)) and parents of 66 gifted children (Mage = 10.82; SD = 3.06, 48,5 % boys (n= 32); 51,5 % girls (n= 34)). Thus, 127 parents with children aged between 6 and 17 years participated in the study. All the participants were Turkish native speakers. To the present study, the criterion sampling method was used, which is a purposive sampling method. Purposive sampling is a non-probability sampling method that involves the selection of research subjects or informants based on their knowledge, expertise, or unique characteristics that are relevant to the research objectives. Purposive sampling may be susceptible to bias, yet it remains an efficacious strategy. When informed by expert judgement in participant selection, it typically yields more precise outcomes than random probability sampling (Tongco, 2007). A prevalent form of purposive sampling is criterion sampling. It is frequently employed in implementation research to identify information-rich case studies that align with the study's specific criteria (Palinkas et al., 2015).

The study included participants who were parents of children diagnosed with giftedness and with both ADHD and giftedness. ADHD diagnosed children in the study were required to have received a diagnosis of ADHD from a qualified professional psychiatrist. In addition to that, giftedness must have been identified through the The Science and Art Centre (BILSEM; Bilim ve Sanat Merkezi) admission assessment or by utilizing the Anadolu-Sak Intelligence Scale (ASIS), the Wechsler Intelligence Scale for Children (WISC-R), or the Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV) for all children. These intelligence scales (ASIS, WISC-R or WISC-IV) were chosen because they were the standard assessment tools used in the admission process to the Science and Art Centre (BILSEM). Diagnostic information was collected from parents, and all diagnoses were made by mental health professionals prior to the start of the study. Parents have reported that 64 children's students were diagnosed through Science and Art Centre admission assessment, while 63 children were diagnosed by a psychiatrist. This approach was adopted to ensure that giftedness or both giftedness and an ADHD diagnosis were present. Additionally, as an inclusion criterion, the age range of the children should be between 6 and 17 years. The age ranges of 6 and 17 years were chosen because the Turkish adaptation study of Conners' Parent Rating Scale-Revised Short Form was conducted with children in this age group (Kaner et al., 2013). For that reason, parental ratings for the children who were not between the ages of 6 and 17 were excluded from the dataset. Furthermore, data from subjects who did not meet the inclusion criteria were excluded from the study.

The study was announced via electronic mail to parents of children diagnosed with ADHD and giftedness and only with giftedness who had previously attended one of the author's seminars about characteristics of gifted children in various Science and Art Centres and registered for the electronic mailing list to receive notifications regarding forthcoming study announcements. The research was also announced in several institutions dedicated to providing educational opportunities for gifted children. The online link to the research was shared with parents who expressed an interest in participating in the study. All parents in the study group gave informed consent. Data were then collected using an online form that was sent to parents via email or other online channels.

Measures

The measurement tools included in this study were the demographic form and Conners' Parent Rating Scale-Revised Short Form, all of which were answered in Turkish.

Demographic Form

The form was developed by the researchers and used to collect data from the participating parents, including information about their children's age, gender, grade, the intelligence scale used to diagnose giftedness, whether they were diagnosed with ADHD by a psychiatrist, and their parents' level of education.

Conners' Parent Rating Scale-Revised Short Form (CPRS-RS; Conners, 1997)

Based on the DSM-5 diagnostic criteria, the Conners' Parent Rating Scale-Revised Short Form (CPRS-RS) has been extensively used in clinical and research settings to measure the cognitive, emotional, and behavioral symptoms of ADHD and associated disorders. This scale was developed by Conner in 1997. The Conners' Parent Rating Scale is completed by parents, which is a tool's strength because it allows for observations from numerous informants in diverse circumstances. According to the CPRS-RS, the responder must identify the degree or frequency of each behavior mentioned in the question on a scale of 0 (not at all true), 1 (just a little true), 2 (very much true), or 3 (very much true). The items address cognitive, emotional, and behavioral symptoms of ADHD and associated disorders in children and adolescents aged 6 to 18 years. Adaptation studies of the CPRS-RS in Turkish were conducted by Kaner et al. (2013) with children aged 6 to 17 years from seven cities in Turkiye. The scale consists of three subscales (Oppositional Defiant Behavior, Cognitive Problems-Inattention, Hyperactivity) and one auxiliary scale (ADHD Index) with a total of 27 questions. The Cronbach's alpha coefficients of the subscales ranged between 0.73 and 0.86, indicating a high level of internal consistency for the scale. The Oppositional Defiant Behavior and Cognitive Problems-Inattention subscales demonstrated strong internal consistency, with an α = 0.83. In contrast, the Hyperactivity subscale exhibited a lower reliability coefficient with α = 0.73, in comparison to the other subscales. The split-half reliability coefficients of the subscales varied from 0.72 to 0.85 respectively. The total Cronbach's Alpha value was not included in the Turkish adaptation of the CPRS-RS (Kaner, 2013), and there was only reporting of the internal consistency coefficients and split-half analysis results for the sub-dimensions. However, since our analyses were based on the total score of the scale, we also calculated the total internal consistency coefficient on the research sample. In the present study, Cronbach's alpha coefficient was calculated, and the total Cronbach's alpha value of the scale was found to be 0.97. The internal consistency of the oppositional-defiant behavior, hyperactivity and cognitive problems-inattention subscales were calculated to be 0.93. The reliability coefficients of the subscales, calculated by the split-half method, were found to vary between 0.84 and 0.90. These

values indicate a high reliability of the scale. The findings confirm that the scale has satisfactory internal consistency.

Statistical Analyses

Analyses were performed using IBM Statistical Package for the Social Sciences (SPSS, version 26). Prior to analyses, the data set was examined for outliers and a total of three outliers were identified. However, subsequent analysis revealed that these outliers were an inherent part of the dataset and had minimal impact on the findings. Consequently, it was decided that the outliers should be retained within the dataset to prevent data loss and to reflect the actual situation. Then the data were screened for normality, and the normality assumption was met for the group who consists of gifted children with an ADHD diagnosis for the total score, oppositional defiant behavior score, cognitive problems-inattentiveness score, and hyperactivity score, respectively. The data also were screened for normality group who consists of gifted children without ADHD diagnosis. A Kolmogorov-Smirnov test showed significant deviation from normality for total CPRS-RS total score and subscale scores. The assumption of normality was also evaluated through visual analysis of the QQ plot, histogram, and the stem-and-leaf plot. For total score, oppositional defiant behavior score, cognitive problems-inattention score, small deviations from the distribution line were observed, these deviations can be considered within acceptable limits indicating that the data follow an approximately normal distribution. The hyperactivity subscale confirms a deviation from normality.

Such violations of the normality assumption may compromise the validity of parametric tests. When employed with non-normally distributed data, standard statistical tests for analysing continuous data, such as the t-test, have the potential to yield erroneous results. Nevertheless, Sainani (2012) stated that this assumption assumes particular significance in the context of small sample sizes yet becomes irrelevant with larger sample sizes. Researchers have indicated that, even in cases of significant deviations from normality, a sample size of approximately 80 is generally adequate for conducting a t-test (Lumley et al., 2002). Conversely, when deviations from normality are more moderate, considerably smaller sample sizes are sufficient (Sainani, 2012). In accordance with the aforementioned information, given that the number of participants in the present study comprised approximately 60 participants per group and the distribution of the data did not deviate to a significant extent from the normal distribution, it was deemed appropriate to conduct the independent sample t-test. Morever, because non-normally distributed data belonged to the gifted children without a diagnosis of ADHD, it is actually expected that they would score low on the scale and the clustering would be in right direction. That is, the normal distribution of the data from gifted group with their scores from the current measurement tool may not be possible to obtain. An independent samples t-test was chosen instead of a multivariate analysis of variance (MANOVA) for total score, since the assumption of multicollinearity between the dependent variables and a linear relationship between pairs of dependent variables within each group of independent variables was not met.

A multivariate analysis of variance (MANOVA) test was used to examine whether there were statistically significant differences between gifted/ADHD and gifted/non-ADHD groups in terms of their subscale scores. Preliminary assumption testing was conducted prior to conducting the MANOVA. The dependent variables used in the study are at the interval level of measurement. This assumption was fulfilled. The independent variable utilised in the present study is ADHD diagnosis, which is measured at the categorical (nominal) level. As the variables ADHD diagnosis (present or not) have a binary categorical structure, the MANOVA assumption that the independent variables are categorical was also met. There are 61 participants in the gifted/ADHD group and 66

participants in the gifted group. The number of participants in both groups is over 30 and the groups have a balanced distribution. For ADHD-diagnosed group, all variables were normally distributed ($p > .200$). For gifted/non-ADHD group, none of the variables were normally distributed ($p < .001$). This assumption was partially met. It is important to note that MANOVA is robust to minor deviations from normality when a minimum of 20 subjects per group is included in the study (Tabachnick & Fidell, 2013).

Additionally, multicollinearity of the dependent variables and a linear relationship between pairs of dependent variables for each group of the independent variable were met. The correlation coefficients between the dependent variables were all found to be less than 0.80, indicating the validity of performing a MANOVA. Similarly, the absence of singularity was confirmed. The assumption of homogeneity of covariance was tested using the Box's test. The analysis revealed that the assumption was not met (Box's M = 59.513, F (6, 112294.068) = 9.660, $p < .001$). The test revealed a violation of the assumption of homogeneity across three dependent variables. Tabachnick and Fidell (2013) stated that when group sizes are close together (61 and 66 in this study), the violation of equality of error variances will not significantly affect the MANOVA results. Box's test is known to be sensitive to deviations from multivariate normality, it may produce non-significant results not because the matrices are similar, but because the assumption of multivariate normality is violated. With equal sample sizes, there is a tendency to disregard the Box's test because it is unstable. In such circumstances, Hotelling and Pillai's statistics are considered robust. Therefore, due to the violation of homogeneity of covariance assumption, the Pillai's Trace method was used to assess the multivariate significance of the main effects and interactions in the analysis (Olson, 1974).

Moreover, Levene's test for equality of error variances revealed that the assumption of homogeneity of variance was not met for any of the dependent variables, ($p > .05$). The test results indicated significant differences in error variances across groups for all dependent variables. The findings indicate that the assumption of homogeneity of variances, a prerequisite for parametric tests, was also violated. If the assumption of equal variances is not met, a more conservative alpha level should be employed when evaluating significance in univariate F-tests (Tabachnick & Fidell, 2013). A significance level of 0.01 was applied to interpret the results of the study.

First, an independent sample t-test was conducted with the variable of ADHD total score as the dependent variable to compare the mean difference between parents' responses to the CPRS-RS for their gifted children with the scores of gifted children with ADHD diagnosis. Lastly, multivariate analysis of variance (MANOVA) was used to examine whether parents' perceptions of ADHD symptoms differed according to ADHD diagnosis. Diagnosis (as gifted-ADHD and gifted/non-ADHD) was the independent variable, and the CPRS-RS subscale (Oppositional Defiant Behavior, Cognitive Problems-Inattention and Hyperactivity) scores derived from parents were the dependent variables of the analysis.

Ethics Committee Approval

Ethics committee approval was received for this study from Istanbul Medeniyet University Social and Humanities Ethics Committee (Approval no: E-38510686-000-2300078679, Date: 26.12.2023).

Results

The parents' demographic data are presented in Table 1. Educational level of the parents of gifted children with an ADHD diagnosis (N = 61) revealed that most participants held

degree-level qualifications. The data indicate that 86.9% of the sample had attained education beyond the secondary level, suggesting that the parental cohort is highly educated. Gifted children's parental educational attainment (N = 66) demonstrated that most parents held undergraduate degrees, followed by master's degree graduates. Secondary education completion was reported by few participants, while doctoral degree attainment and less than high school degree showed equally low in proportion. The data suggest that the group of samples also characterized by high educational attainment.

Table 1.
Demographic Data of the Parents of Twice-Exceptional Children

	Gifted/ADHD		Gifted/ Non-ADHD	
	(n=61)		(n=66)	
Variable	**n**	**%**	**n**	**%**
Educational Level				
Less than high school	1	1.6	2	3.0
High school graduate	7	11.5	7	10.6
University graduate	27	44.3	39	59.1
Master's degree graduate	20	32.8	16	24.2
PhD graduate	6	9.8	2	3.0

Furthermore, an independent samples t-test was conducted to compare the mean of a sample of ADHD scores of the gifted children with the mean of the gifted children with ADHD diagnosis. Levene's test revealed a significant violation of the homogeneity of variance assumption (F(1, 125) = 26.00, p < .001), indicating unequal variances between groups. The results from the unequal variances t-test were reported. An Independent Samples t-test reported a significant difference in ADHD scores between gifted children with a diagnosis of ADHD (M = 1.46, SD = 0.63) and gifted children (M = 0.41, SD = 0.33; t (88.553) = 11.712, p < .001), with a mean difference of 1.05 (95% CI [0.87, 1.23]) and a very large effect size found (d = 2.09). This substantial effect indicates that the difference in ADHD scores between the two groups is statistically significant. Specifically, scores of gifted children with an ADHD diagnosis are markedly higher on the CPRS-RS compared to the scores of gifted children, highlighting a profound distinction between the two groups (see Table 2).

Table 2.
Independent Sample t-Test Results

	Gifted/ADHD[1]		Gifted/Non-ADHD[2]		t	p	Cohen's d
	M	**SD**	**M**	**SD**			
ADHD Symptoms	1.46	0.63	0.41	0.33	11.712	<.001	2.09

Note: N = 127, M = mean, SD = standard deviation, t = t statistic. / [1] n = 61. [2] n = 66.

A one-way multivariate analysis of variance (MANOVA) was conducted to examine whether there was a significant difference in ADHD symptoms in terms of oppositional defiant behavior, hyperactivity and cognitive problems-inattention among gifted children with and without ADHD diagnosis as measured by the Conners Parent Rating Scale–Revised Short Form. The MANOVA test revealed a statistically significant difference between the ADHD/gifted and gifted/ non-ADHD children on the linear combination of dependent variables and the statistical analysis indicated a large effect size (F(3,123) = 52.335, p < .001; Pillai's Trace = .561, ηp2= .561, see Table 3).

Table3.
MANOVA Results

	Pillai's Trace	**F**	**Hypothesis df**	**Error df**	**p**	**η_p^2**
Group	.561	52.335	3	123	< .001	.561

Note. F = F statistic, η_p^2= partial eta squared.

Follow-up univariate analyses of variance (ANOVAs) were conducted to ascertain the influence of ADHD status on each dependent variable in isolation. These univariate ANOVAs disclosed significant disparities between groups for all three measures. The univariate ANOVA results indicated a significant difference between gifted/ADHD children (M = 1.38, SD = 0.86) and gifted/non-ADHD group (M = 0.56, SD = 0.51) on oppositional defiant behavior, $F(1, 125) = 107.172$, $p < .001$, ηp2= .492. In addition, a significant difference was found between gifted/ADHD children (M = 1.24, SD = 0.74) and gifted/non-ADHD group (M = 0.20, SD = 0.31) on hyperactivity, $F(1, 125) = 121.064$, $p < .001$, ηp2= .492. Lastly, there was also a significant difference between gifted/ADHD children (M = 1.57, SD = 0.74) and gifted/non-ADHD group (M = 0.39, SD = 0.45) on cognitive problems-inattention $F(1, 125) = 107.172$, $p < .001$, ηp2= .492. The findings suggest that parents of gifted and ADHD-diagnosed children gave higher scores in all subscales. The results show a clear difference between gifted/ADHD and gifted/non-ADHD children across all measured variables. Table 4 presents the descriptive statistics for the dependent variables and Univariate ANOVA results.

Table 4.
Mean, SD, and F-values of dependent variables and Univariate ANOVA Results

Variable	Gifted/ADHD[1] (n=61)		Gifted/Non-ADHD[2] (n=66)				
	M	SD	M	SD	F	p	η_p^2
Oppositional Defiant Behavior	1.38	0.86	0.56	0.51	44.281	< .001	.262
Hyperactivity	1.24	0.74	0.20	0.31	121.064	< .001	.492
Cognitive Problems-Inattention	1.57	0.74	0.39	0.45	107.172	< .001	.462

Note. N = 127, M = mean, SD = standard deviation, F = F statistic, η_p^2= partial eta squared.

Discussion

During the diagnostic procedure, it is very critical to determine the extent to which parents correctly interpret their gifted children's ADHD symptoms. This recognition will play an important role in ensuring that these children receive an accurate diagnosis and support for their educational and developmental needs from an early age. In the present study, Turkish parents' responses to the Conners' Parent Rating Scale-Revised Short Form regarding ADHD symptoms in their children diagnosed with giftedness, as well as both giftedness and ADHD were analyzed to determine the extent to which parents could recognize the symptoms of ADHD in their gifted children.

Our research has deepened our understanding of twice-exceptional children by revealing important insights into the overlap between giftedness and ADHD. These findings will provide a basis for further discussion of the diagnostic process for gifted and ADHD children. The extant literature repeatedly highlights that certain characteristics of giftedness have been shown to closely resemble the symptoms of ADHD. These include heightened emotional and sensory sensitivity, which can be mistaken for hyperactivity or impulsivity, and focused attention, which can be mistaken for inattention (Mullet & Rinn, 2015; Rinn & Reynolds, 2012). The presence of high energy levels may be mistaken as restlessness or hyperactivity (Gomez et al., 2020). The existence of these overlapping traits presents considerable challenges in distinguishing between the two conditions, frequently resulting in misdiagnosis (Mullet & Rinn, 2015) or underdiagnosis (Rosengren, 2004). The current study, however, provides an examination into this issue, offering valuable insights into the extent of these differences. We aimed to clarify the degree to which these overlapping traits are present by comparing the symptoms of ADHD in gifted children with those of both gifted and ADHD-diagnosed children. This will contribute to a better understanding of how these conditions can co-occur.

In our study, parents of gifted children reported significantly fewer ADHD total symptoms for their gifted children compared to the gifted children with ADHD. Furthermore, when subscale scores were considered, parents of gifted children reported a significantly fewer oppositional defiant behavior, cognitive problems/inattentiveness and hyperactivity symptoms in their children when compared to parents of gifted children with ADHD. Our findings are consistent with those of previous studies (François-Sévigny et al., 2022; Gomez et al., 2020; Neihart, 2003) which reported that parents of gifted and ADHD diagnosed children reported more symptoms of inattention and hyperactive–impulsive behaviors than those of gifted children. In addition, François-Sévigny and colleagues (2022) reported that parents of gifted children with ADHD observed more symptoms of aggression and oppositional behavior than parents of gifted children. Based on these findings, we can conclude that gifted children without ADHD exhibit fewer difficulties in managing attention, hyperactivity-impulsivity, and oppositional defiant behavior compared to their gifted peers with ADHD. Thus, our findings highlight the distinction between giftedness and ADHD symptoms, since children with ADHD may require additional help to overcome these behavioral issues and achieve optimum academic and social development.

Previous research has found that higher levels of intelligence are associated with lower levels of ADHD symptoms, particularly attention problems (Rommelse et al., 2017). In their study, Minahim and Rohde (2015) sought to examine the presence of ADHD symptoms in gifted individuals, both adults and children, in Brazil. The investigation involved a sample of 77 adults who demonstrated IQ scores above the 98th percentile, and 39 children with IQ scores above the 99th percentile. The results suggest that ADHD symptoms are more common in the gifted population. On the other hand, the literature also suggests that the prevalence of ADHD may be lower in the gifted population. It has been explained that this may be since ADHD may be more difficult to diagnose in children with high IQ and that these children may have less visible symptoms (Antshel, 2008). The difficulty in identifying ADHD symptoms in gifted individuals is due to the potential overlap between ADHD symptoms and behaviors that are specific to giftedness (Leroux & Levitt-Perlman, 2000). In our study, we were not able to investigate the relationship between increased intelligence level and ADHD symptoms, this issue can be investigated in more detail in future studies. However, we can conclude that ADHD is a valid diagnosis among gifted children and that these children may have symptoms similar to those of typically developing children, as previous studies have shown that there's no significant difference between highly intelligent children with ADHD and typically developing children with ADHD in terms of the clinical features of ADHD, the course of the disorder, outcomes or response to treatment (Antshel et al., 2007, 2008, 2009; Cadenas et al., 2020; Rommelse et al., 2015). In addition, it will be important for future studies to include the symptoms of typically developing children diagnosed with ADHD in order to determine the extent to which parents report the level of ADHD symptoms in gifted children and gifted children diagnosed with ADHD.

Again, concerning symptoms of hyperactivity and impulsivity, the findings of the present study are consistent with the findings of François-Sévigny et al. (2022) and Gomez et al. (2020) that parents reported a greater frequency of hyperactive and impulsive behaviors in gifted and ADHD diagnosed children than in gifted children. Consistent with the study by François-Sévigny et al. (2022), our results showed that parents of gifted and ADHD children reported higher levels of oppositional defiant behavior than parents of gifted children. However, another noteworthy study conducted by Wood (2012) has reported results that are inconsistent with the literature and our findings. The study examined the behavioral differences of gifted students identified as having ADHD, as reported on Conners 3 assessments completed by parents and teachers. The study concluded that, on average, the students had average levels of attention, hyperactive and executive function problems, according to the assessments. The study also found that there was

considerable individual variability and, apart from attention deficit, there was little agreement between parents and teachers. We can conclude that behavioral differences seen in children with both ADHD and gifted diagnosis may contradict the previous literature, because ADHD symptoms in gifted students may not be at the expected severity or these symptoms may be masked because of their giftedness. Furthermore, the significant discrepancy between parent and teacher evaluations indicates interindividual variability and the subjective nature of evaluation processes. This suggests that judgements based on a single source might be misleading.

A multifaceted and detailed assessment process is required to diagnose ADHD (Langberg et al., 2008). The standard approach to assessment currently in use involves a combination of medical examination, clinical interviews with parents, teachers and the child, clinical observation and various rating scales. Some experts argue that behavioral checklists are insufficient for diagnosing ADHD in children (Budding & Chidekel, 2012). Chae, Kim, and Noh (2003) reported that 13.2% of a sample of gifted children were rated by their parents as having ADHD according to behavior checklists, but these students did not meet ADHD clinical criteria. However, this may be due to the measurement tool that is being used. Wood (2012) stated that the Conners 3 scale provides insufficient normative data for gifted students, preventing ADHD diagnosis. The researcher stressed the need for well-designed studies to be conducted. Conners' Rating Scales is one of the most widely used and reliable scales in this field, the result of a 30-year development process. This scale system is based on a comprehensive standardization and the psychometric properties of the scale are quite strong. Moreover, research findings on the psychometric properties and clinical utility of the Conners Scales have consistently maintained validity and reliability across different cultures and sociodemographic groups, providing strong evidence for the scales' cross-cultural utility. In the assessment of attention-deficit/hyperactivity disorder (ADHD) in gifted children, the use of normative data from the Conners Scales has been shown to be a reliable approach (Rosengren, 2004). Despite the conflicting results, the findings of this study, like most research, showed that the Turkish adaptation of the Conners' Parent Rating Scale-Revised Short Form can be used to accurately identify ADHD, one of the most common diagnoses in the gifted population. Researchers and mental health professionals can utilize this scale as a first step in detecting ADHD in gifted children with the help of their parents. It is particularly critical to determine the discriminant validity of the Turkish adaptation of the Conners' Parent Rating Scale–Revised Short Form within gifted and ADHD children. The present study addressed the need to examine the extent to which this instrument accurately captures such distinctions, to inform future clinical applications within this demographic group.

The findings of this study appear to support the validity of ADHD as a diagnostic category in gifted children, as evidenced by previous research (Antshel et al., 2007; François-Sévigny et al., 2022; Gomez et al., 2020; Minahim & Rohde, 2015; Rommelse et al., 2015). Based on our findings, we also concluded that parents differentiated and reported their gifted children's ADHD symptoms accurately. Thus, our results reaffirm the critical role parents play in observing, recognizing, and reporting their gifted children's ADHD symptoms. To draw a clear conclusion about the use of parental rating scales in the diagnosis of ADHD in a gifted population, it would be useful to replicate this study to determine whether parents' reports are consistent with children's diagnoses.

Strengths, Limitations, and Future Directions

The strength of the study is that the sample is rare and diverse, including gifted children as well as gifted children diagnosed with ADHD. In addition, the diagnoses of children were valid that the diagnoses of the children were made by psychiatrists and public

institutions. That's why, a relatively large sample size is a notable strength of the present study. Gifted children with an ADHD diagnosis constitute a significantly smaller percentage of the population, resulting in a more limited opportunity to access them for research purposes. No previous research on this subject has been conducted in Turkiye. This study represents one of the first empirical attempts to examine this group within the Turkish national context. Therefore, this study will make an important pioneering contribution to the field.

The study has also several limitations. Firstly, the data were collected solely from parents, and evaluations from other adults in the child's life were not considered. For example, teachers' ratings on ADHD behavioral assessments have been demonstrated in previous studies to be a reliable source of data collection for gifted children (see François-Sévigny et al., 2022). Secondly, the data were collected solely from parents of gifted children and parents of children diagnosed with both giftedness and ADHD. The limited scope of the data collection, which only excluded parents of children diagnosed with ADHD, prevented any meaningful comparisons between these three groups. Furthermore, the number of girls in gifted and ADHD group accounted for only a quarter of the total respondents, resulting in their underrepresentation in the study. It is recommended that future studies include a larger sample of girls which would allow for the generalization of results.

Additionally, there remains a paucity of information regarding the potential distinctions in symptoms of inattention and/or hyperactivity/impulsivity among three distinct groups: (i) non-gifted children with ADHD, (ii) gifted children with ADHD, and (iii) gifted children with ADHD. In forthcoming studies, a more detailed investigation is required to ascertain how symptoms are observed in different groups. Furthermore, as suggested by François-Sévigny et al. (2022), the utilization of behavioral instruments, such as the Conners-3 Scale, might be enhanced by the incorporation of subscales that indicate giftedness characteristics after these distinctions are revealed more clearly. While the Conners' Parent Rating Scale-Revised Short Form reliably quantifies ADHD symptoms in Turkish gifted children, the including a subscale into behavioral scales might be a worthwhile consideration. Finally, the question of whether the increase in the level of intelligence has any effect on the symptoms or on the prevalence of ADHD can be considered as a potential topic that can be investigated in future studies.

This study is pioneering as it explores a new area of research in Turkiye. The objective of the study was to evaluate the parents' symptomatic awareness as well as their ability to discriminate their children's clinical characteristics from their own perspectives. To accurately capture the perceived patterns and severity of symptoms experienced by their children, a self-report measure in the form of a parent-rating scale was used. Although the study provides valuable insights into the subject, it also emphasizes the need for further in-depth research to guide future studies. The data for the present study was collected using a single measurement tool, which constitutes a notable methodological limitation. The findings' interpretability and generalizability are significantly constrained by the lack of multi-informant data, such as teacher reports, clinical observations, or objective cognitive assessments. Future research should aim to include a larger sample of girls diagnosed with both giftedness and ADHD with. It is also recommended to collect data from multiple sources familiar with the child, such as teachers. Finally, to gain a more comprehensive understanding of the topic, it would be beneficial to compare the results between children diagnosed with ADHD alone. As children with ADHD were not included in the study, we were not able to find out whether higher intelligence influenced the severity of symptoms.

Conclusion

The present study aimed to investigate the Turkish parents' perceptions of the ADHD symptoms in their gifted children and gifted and ADHD diagnosed children by using Conners' Parent Rating Scale-Revised Short Form. The results of the study highlighted significant differences between the two groups in terms of behavior, cognition and hyperactivity that parental ratings on cognitive difficulties, oppositional defiant behaviors and hyperactivity were significantly higher in the gifted children with ADHD diagnosis than in the gifted children. Furthermore, the results of the study indicate that gifted children diagnosed with ADHD exhibited higher overall symptom scores, suggesting that ADHD significantly impacts a wide range of gifted children's cognitive and behavioral functions. The findings suggest that the utilization of Conners' Parent Rating Scale-Revised Short Form is a valid scale for distinguishing of the gifted children from the gifted and ADHD children. The parental ratings in the present study were consistent with the clinical diagnosis. These results further highlight the significance of parental assessments in the recognition of ADHD in the context of giftedness, where it is likely that the symptoms of attention-deficit/hyperactivity disorder (ADHD) are difficult to differentiate from characteristics specific to giftedness.

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