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Original Article (Pages: 149-161)

Assessment of Adolescent Personality Traits Using the Bender Gestalt Test II: Validity, and Limitations in a Sample from Jolfa, Iran

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Abstract

Background: Adolescence is a critical psychosocial stage characterized by significant physical, cognitive, and emotional changes that shape personality development. This study aims to examine the personality traits of adolescents using the Bender Gestalt Test II (BGII) and to assess its effectiveness in identifying personality traits and structures during this developmental period.

Materials and Methods: This descriptive-analytical study employed stratified random sampling to select 354 male and female students aged 12 to 19 from Jolfa, East Azerbaijan, Iran. The BGII served as the primary tool for assessing personality traits. To enhance the accuracy and validity of the findings, the short form of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) was administered concurrently as a complementary measure. Data analysis was performed using SPSS version 13.0.

Results: Findings indicated that mean error scores on the BGII among adolescents significantly increased until age 15, decreased until age 18, and then increased again at age 19 ($p = 0.001$), reflecting developmental and identity transitions during adolescence. Confirmatory factor analysis demonstrated a good model fit (RMSEA = 0.03, GFI = 0.96, CFI = 0.97, $p = 0.001$), identifying five key factors: anxiety, schizophrenia, obsessive-compulsive traits, depression, and aggression. Sensitivity and specificity values indicated high accuracy for aggression (0.83, 0.83), depression (0.67, 0.78), and psychological weakness (0.71, 0.65). Significant correlations with schizophrenia ($r = 0.44$, $p = 0.001$) and psychological weakness ($r = 0.33$, $p = 0.001$) supported the convergent validity of the BGII. However, limitations were noted in assessing characteristics such as hysteria, hypochondriasis, hypomania, and social introversion, highlighting areas for further investigation.

Conclusion: The BGII is a valid and reliable instrument for assessing key personality traits in adolescents aged 12 to 19, including aggression, schizophrenia, anxiety, and depression. Variations in test performance correspond to the developmental changes typical of adolescence. Nevertheless, due to limitations in detecting certain traits such as hysteria and social introversion, it is recommended that the BGII be used in conjunction with other assessment tools to ensure comprehensive and accurate evaluation.

Key Words: Adolescents, Bender Gestalt Test II, Iran, Personality traits, Minnesota Multiphasic Personality Inventory-2.

*Please cite this article as**:** Abdali H, Vagef L. Assessment of Adolescent Personality Traits Using the Bender Gestalt Test II: Validity, and Limitations in a Sample from Jolfa, Iran. Health Provid 2025; 5(2): 149-61. doi: **10.22034/HP.2025.539250.1075**

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Received date: Mar. 15, 2025; Accepted date: Jul.22, 2025

1- INTRODUCTION

Adolescence is one of the most sensitive and formative stages of human development, marked by significant physical, cognitive, and psychosocial changes that contribute to the formation of personality structure and individual identity (1, 2). Accurate and scientific assessment of personality traits during this period plays a crucial role in the early identification of psychological disorders and in planning effective educational and therapeutic interventions (3). The unique cultural and social challenges faced by Iranian adolescents highlight the importance of localizing and validating psychological assessment tools to ensure cultural relevance and diagnostic accuracy (4).

The Bender Gestalt Test, originally developed by Dr. Lauretta Bender in 1938, is widely recognized as a reliable instrument for assessing visuomotor integration and perceptual organization (1, 3). The second edition of this test (Bender Gestalt Test II) expands upon the original by incorporating additional stimulus cards, standardized scoring methods, and recall phases, making it one of the most comprehensive tools for neuropsychological and personality assessment across a wide age range—from childhood to old age (1, 3). This test has well-established applications in clinical and research settings, including diagnosing brain injuries, learning disorders, and psychological traits (3, 5, 6).

Empirical studies have demonstrated that the BGII possesses strong structural validity and psychometric reliability. Its effectiveness in discriminating neuropsychological functioning between students with learning disabilities and typically developing peers has been confirmed. Additionally, this tool has identified emotional differences between these groups. In clinical populations, its application to patients with schizophrenia has revealed distinctive error patterns (4, 7, 8). Some research further indicates that cultural and socioeconomic factors significantly affect children's performance on the Bender Test (6). The test also shows adequate diagnostic capability for Attention Deficit Hyperactivity Disorder (ADHD), although its sensitivity for other psychopathologies is relatively limited (9, 10).

Given the scarcity of comprehensive and culturally adapted research on the performance and validity of the Bender Gestalt Test 2 among Iranian adolescents—particularly in culturally and socially distinct regions like Jolfa—a detailed evaluation of the test's efficacy in identifying key personality and psychological dimensions is essential. Concurrent comparison with internationally recognized instruments, such as the short form of the Minnesota Multiphasic Personality Inventory (MMPI-2), can provide a more precise and practical framework for clinical and research applications (8, 11).

Accordingly, this study aims to comprehensively assess the personality traits of adolescents in Jolfa using the Bender Gestalt Test II and to evaluate its validity and limitations by concurrently comparing it with the short form of the MMPI-2. The goal is to determine its accuracy, reliability, and clinical applicability within the context of adolescent mental health in the Iranian sociocultural environment.

2- MATERIALS AND METHODS

2-1. Study Design

Within this descriptive-analytical, cross-sectional study conducted in 2017, personality traits of adolescents in Jolfa city were comprehensively examined using the Bender Gestalt Test II (BGII). The study also evaluated the validity and limitations of the BGII by comparing it

simultaneously to the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) short form.

2-2. Sample Size and Sampling Method

The statistical population comprised 354 adolescents aged 12 to 19 years residing in Jolfa, East Azerbaijan Province, Iran. Participants were selected through stratified random sampling to ensure representativeness across age, gender, and educational level. Inclusion criteria included no history of severe psychiatric or neurological disorders (8, 11) and obtaining written informed consent from the adolescents and their parents or legal guardians.

2-3. Sensitivity and Specificity Assessment

In addition to the main sample, 30 students were randomly selected through simple random sampling from the study population to participate in the second phase, which focused on evaluating the sensitivity and specificity indices of the Bender Gestalt Test. Structured diagnostic interviews based on the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) criteria were conducted by a clinical psychologist to accurately determine each participant's clinical status regarding the presence or absence of psychiatric disorders. These clinical evaluations served as the gold standard for calculating the sensitivity and specificity of the Bender Gestalt Test (4, 10).

2-4. Inclusion Criteria

- Age between 12 and 19 years,
- Residency in Jolfa city and enrollment in the appropriate educational levels for this age group,
- Written informed consent obtained from both the participant and their parents or legal guardian,
- Basic cognitive ability sufficient to complete psychological assessments (no severe intellectual disability),
- No history of significant chronic psychiatric or neurological disorders that might affect cognition or test performance (e.g., stroke, uncontrolled epilepsy, chronic cognitive impairment, neurodegenerative diseases) (8, 11).

2-5. Exclusion Criteria

Participants were excluded if they met any of the following conditions:

- Inability or unwillingness to complete psychological tests under standardized conditions,
- Clinical diagnosis or history of acute or chronic psychiatric or neurological disorders identified after enrollment (e.g., acute depression, psychotic disorders, recent brain injury),
- Physical illness or emergency during test administration preventing continuation,
- Severe impairments in comprehension or attention that made test completion impossible,
- Voluntary withdrawal by the participant or their parents/legal guardian at any stage of the study.

2-6. Measurement Instruments

2-6-1. Bender Gestalt Test II (BGII):

The Bender Gestalt Test II (BGII) is a neuropsychological assessment tool consisting of 16 standardized cards with geometric designs, used to evaluate visual-motor integration, brain function, and personality traits. This updated version includes additional stimulus cards, an improved scoring system known as the Global Scoring System, and a recall phase to assess memory and executive

functioning. Each card is scored on a scale from 0 to 4 based on the accuracy of copying the design, with total scores typically ranging from 0 to 52 for examinees under 8 years old, and from 0 to 48 for those aged 8 and above. The test also examines specific mistakes such as distortions and rotations, while qualitative observations of the participant's behavior during testing provide valuable clinical insights. Interpretation focuses on the interaction between visual perception and motor coordination; lower scores reflect strong integration and typical development, whereas higher scores may indicate neurological impairments, learning difficulties, or psychological conditions such as anxiety and schizophrenia (1, 3).

Extensive research conducted in Iran has confirmed the BGII's strong psychometric properties, especially among children and patients with brain injuries. Reliability evidence includes test-retest coefficients around 0.77, inter-rater reliability with intraclass correlation coefficients (ICC) near 0.81, and internal consistency (Cronbach's alpha) around 0.85 (10, 12). Its validity is supported by significant correlations with other well-established measures such as the Goodenough Harris Draw-A-Person Test and by its sensitivity to expected developmental differences across age groups. Furthermore, the BGII demonstrates excellent diagnostic accuracy, correctly distinguishing patient and normal groups with about 98.3% precision. Normative data obtained from Iranian populations reveal some cultural differences compared to international samples, highlighting the importance of local adaptation and validation to ensure accurate assessment in this context (10).

2-6-2. Short Form of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2):

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is a widely recognized and extensively used psychological assessment tool designed to evaluate personality traits and psychopathology. The full version comprises 567 true/false items and typically requires 60 to 90 minutes to complete. This inventory includes 10 primary clinical scales that assess various psychological conditions such as depression, hysteria, paranoia, and schizophrenia. Raw scores obtained from these scales are converted into standardized T-scores with a mean of 50 and a standard deviation of 10, generally ranging from 30 to 80. Scores above 65 are typically interpreted as indicating elevated symptom severity or significant psychological concerns. The MMPI-2 short form, known as the MMPI-2 Restructured Form (MMPI-2-RF), contains approximately 370 true/false items and was the version employed in this study (13, 14).

Regarding its psychometric properties, the MMPI-2 has demonstrated strong validity and reliability in numerous national and international studies. Validity refers to the test's ability to accurately identify personality traits and psychological disorders, which has been confirmed in Iranian samples through alignment with DSM-5 diagnostic criteria (15, 16). The MMPI-2's reliability is robust, as evidenced by its effective differentiation between individuals with genuine psychological conditions and those feigning symptoms. Internal consistency coefficients (Cronbach's alpha) generally range from 0.70 to 0.90 across diverse samples (17). However, cultural factors significantly influence response patterns, underscoring the essential need for ongoing localized validation and further research to enhance the MMPI-2's precision and applicability across different Iranian populations (18).

2-7. Data Collection Procedure

After obtaining ethical approval from the relevant authorities and informed consent from both students and their parents, the Bender Gestalt Test II was individually administered in appropriate school settings in Jolfa. Each participant sequentially viewed the test cards and attempted to reproduce the designs on a blank A4 sheet of paper. The administration strictly followed standardized protocols and was conducted under continuous supervision to ensure accuracy and consistency. Upon completion of the Bender Test, the same participants completed the MMPI-2 short form via self-report. A qualified supervisor was present throughout to clarify any questions and ensure data integrity. Concurrently, demographic information—including age, gender, and educational grade—was collected using self-report questionnaires.

2-8. Ethical Considerations

This research was approved by the Ethics Committee of Islamic Azad University, Tabriz Branch (ID code: 6320/710) and was conducted in full accordance with established ethical principles, including respect for persons, beneficence, and justice, as outlined in the Belmont Report (19). Prior to participation, all adolescent subjects and their parents or guardians were thoroughly informed about the study's objectives, procedures, potential benefits, and risks, and written informed consent was obtained from all parties. Participants were clearly informed of their right to withdraw from the study at any time without penalty or coercion. Confidentiality of all personal information was strictly maintained; all data were anonymized and coded to protect participant privacy. Testing environments were arranged to ensure participant comfort and psychological well-being, minimizing any potential risks or distress. Sampling and study procedures were designed to guarantee equitable access and participation for all relevant groups without discrimination. The sole purpose of the study was to advance knowledge and improve mental health among adolescents, and collected data were used exclusively within this scope.

2-9. Data Analysis

The collected data were entered into SPSS version 13 for statistical analysis. Descriptive statistics were used to summarize demographic characteristics and score distributions of both assessment instruments. The internal consistency of the Bender Gestalt Test was examined using Cronbach's alpha coefficient. Structural validity was evaluated through confirmatory factor analysis (CFA) using LISREL software version 8.35. Convergent validity between corresponding scales of the Bender Gestalt Test and the MMPI-2 was assessed using Pearson correlation coefficients. Furthermore, the sensitivity, specificity, and predictive values of the Bender test were calculated using MMPI-2 results and DSM-5-based structured clinical interviews as reference standards.

3- RESULTS

3-1. Descriptive Findings

3-1-1. Demographic Analysis of the Sample

This study examined a total of 354 students aged 12 to 19 from Jolfa city, selected using stratified and equal sampling methods, with 44 participants in each age group. The primary aim was to investigate the trend of changes in error scores on the BGII throughout adolescence. Descriptive statistics revealed that the mean error scores significantly increased from 4.55 at age 12, reaching a peak of 8.43 at age 15. Following this peak, mean error scores declined until age 18, then rose again significantly at age 19 to a mean of 8.61. This pattern of changes

in error scores likely reflects the psychological, identity-related, and biological developments during adolescence, which are accompanied by psychosocial stresses and shifts in adolescent identity formation.

Table 1 presents the descriptive statistics of error scores, including the mean, median, mode, standard deviation, variance, and range for each age group. Notably, the mode (most frequent value) across all age groups was zero, indicating a high prevalence of error-free performances. Additionally, the greatest variability in error scores occurred at age 15, suggesting pronounced individual differences in responses to developmental changes during this critical period.

Table 1. Descriptive Statistics of Error Scores on the BGII by Age Groups.

Age Group	Sample Size	Mean Score	Median	Mode	SD	Variance	Range	Min	Max
12 years	44	4.55	3	0	5.06	5.60	18	0	18
13 years	44	5.43	1	0	8.00	64.02	34	0	34
14 years	44	6.41	4	0	7.20	51.78	29	0	29
15 years	44	8.43	4	0	12.93	167.27	69	0	69
16 years	44	5.54	4	0	6.56	43.04	24	0	24
17 years	44	5.34	3.5	0	7.08	0.18	25	0	25
18 years	44	5.82	2	0	9.77	95.50	44	0	44
19 years	44	8.61	4.5	0	11.28	127.17	51	0	51

SD: Standard deviation, Min: Minimum, Max: Maximum, BGII: Bender Gestalt Test II.

3-1-2. One-Way ANOVA Results

To examine significant differences in mean error scores among the age groups from 12 to 19, a one-way analysis of variance (ANOVA) was conducted (**Table 2**). The results indicated that the differences in mean error scores across these age groups were statistically significant ($F(7, 346) = 7.85$, $p = 0.001$). This finding highlights significant variation in error rates as age increases.

The notable increases in error scores observed particularly at ages 15 and 19 may reflect key psychological development processes, identity-related pressures, and social challenges commonly experienced during these critical stages of adolescence.

Table 2. One-Way ANOVA Results Comparing Mean Error Scores across Age Groups.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F-value	P-value
Between Groups	720.45	7	102.92	7.85	0.001
Within Groups	4190.75	346	12.11		
Total	4911.20	353			

These results indicate that the BGII effectively captures specific changes in visuomotor performance and personality traits throughout adolescence. Based on these patterns, future clinical and research interventions can be developed. The statistical analyses conducted confirm that these changes are statistically significant and reflect important developmental and identity-related transformations within this age group.

3-2. Analytical Results

For a comprehensive evaluation of the BGII in identifying personality traits among adolescents, confirmatory factor analysis (CFA), sensitivity and specificity indices, as well as concurrent validity,

were examined. Sensitivity and specificity indices reflect the test's ability to accurately identify individuals with and without particular psychological traits (true positives and true negatives). Concurrent validity was assessed through simultaneous administration of the well-established MMPI-2 short form questionnaire, which measures eight fundamental psychological traits.

3-2-1. Confirmatory Factor Analysis (CFA) Results of the BGII

The personality structure measured by the BGII was examined using confirmatory factor analysis (CFA) with LISREL software version 8.35. The modified model identified five main latent factors: Anxiety, Schizophrenia, Obsessive-Compulsive Traits, Depression, and Aggression. These factors effectively represented the psychological-personality structure of the adolescent sample (**Table 3**). The model fit indices indicated an excellent fit between the proposed model and the observed data:

Table 3. Confirmatory Factor Analysis of the Bender Gestalt Test II Personality Structure: Model Fit Indices and Factor Loadings.

Index	Value	Explanation
RMSEA (Root Mean Square Error of Approximation)	0.03	Desirable (less than 0.05)
χ^2 (Chi-square)	242	Model fit test
df (Degrees of Freedom)	121	
P-value	0.001	Significant model
GFI (Goodness of Fit Index)	0.96	Above 0.90 desirable
AGFI (Adjusted GFI)	0.95	Above 0.90 desirable
CFI (Comparative Fit Index)	0.97	Above 0.90 desirable
NFI (Normed Fit Index)	0.95	Above 0.90 desirable
TLI (Tucker-Lewis Index)	0.96	Above 0.90 desirable

Factor loadings indicated that Anxiety had the highest loading, followed in order by Schizophrenia, Obsessive-Compulsive Traits, Depression, and Aggression. These findings suggest that Anxiety is the strongest contributor to the underlying latent personality construct, with other factors providing progressively smaller contributions. The overall high loadings across all five factors demonstrate a coherent and robust relationship among these psychological traits within the adolescent sample.

3-2-2. Examination of Sensitivity and Specificity Indices of the BGII in Diagnosing Personality Traits

In this study, sensitivity and specificity indices of the BGII were calculated to evaluate its accuracy and effectiveness in identifying personality traits among adolescents. A subsample of 30 participants was randomly selected from the total sample. These participants underwent independent clinical evaluations by a licensed psychologist, who applied DSM-5 diagnostic criteria and administered the MMPI-2 questionnaire as reference standards. The results of the BGII were then compared against these clinical assessments, and sensitivity and specificity coefficients were computed for each personality trait. In this context, coefficients greater than 0.60 were considered indicative of acceptable test performance and satisfactory validity for the corresponding trait (20).

Table 4. Sensitivity and Specificity Indices of the Bender Gestalt Test II for Each Personality Trait.

Personality Trait	Sensitivity	Specificity
Aggression	0.83	0.83
Schizophrenia	0.83	0.92
Anxiety	0.80	0.80
Obsessive-Compulsive	0.70	0.90
Depression	0.67	0.78
Psychopathy (Weakness of Mind)	0.71	0.65
Antisocial Behavior	0.54	0.53
Hysteria	0.55	0.63
Hypochondria	0.43	0.52
Social Introversion	0.50	0.72
Hypomania	0.50	0.69
Paranoia	0.50	0.54

As shown in **Table 4**, the BGII demonstrates sensitivity and specificity values exceeding 0.60 for detecting aggression, schizophrenia, anxiety, obsessive-compulsive traits, depression, and psychopathy, indicating strong accuracy and satisfactory validity in assessing these particular personality domains among adolescents.

3-2-3. Concurrent Validity of the BGII with the MMPI-2 Questionnaire

To assess concurrent validity, participants completed the BGII and the MMPI-2 short form questionnaire simultaneously. The MMPI-2 short form evaluates eight primary psychological traits: Schizophrenia, Depression, Psychopathy (Weakness of Mind), Paranoia, Hysteria, Hypochondria, Hypomania, and Social Deviance.

Pearson correlation coefficients were calculated between the total BGII scores and each MMPI-2 subscale. According to the criterion proposed by Kaplan et al. (2017), correlations in the range of 0.30 to 0.40 indicate acceptable validity (21). **Table 5** presents the correlation coefficients between the total BGII scores and the MMPI-2 subscales, alongside their interpretations.

Table 5. Correlation Coefficients (r) between Total BGII Scores and MMPI-2 Subscales.

Psychological Trait	Correlation (r)	Interpretation
Schizophrenia	0.44	Desirable; explains 19% of variance
Depression	0.39	Desirable; explains 15% of variance
Psychopathy (Weakness of Mind)	0.33	Desirable; explains 11% of variance
Social Deviance	0.31	Desirable; explains 10% of variance
Anxiety	~0.30	Acceptable
Hypomania	0.28	Undesirable
Paranoia	0.26	Undesirable
Hysteria	0.29	Undesirable
Hypochondria	0.19	Undesirable

BGII: Bender Gestalt Test II, MMPI-2: Minnesota Multiphasic Personality Inventory-2.

The correlation matrix (**Table 6**) details relationships between total BGII scores and MMPI-2 subscales, indicating statistically significant positive correlations across all subscales. This suggests an association between visuomotor integration performance errors measured by the BGII and the psychological traits assessed by the MMPI-2.

Table 6: Correlation Matrix between Total BGII Scores and MMPI-2 Subscales.

Variables	1	2	3	4	5	6	7	8	9
1. Bender Gestalt II	1								
2. Hypomania	0.28	1							
3. Schizophrenia	0.44	0.11	1						
4. Psychopathy	0.33	0.08	0.19	1					
5. Paranoia	0.26	0.12	0.31	0.29	1				
6. Hysteria	0.29	0.10	0.18	0.26	0.12	1			
7. Hypochondria	0.19	0.14	0.14	0.21	0.15	0.22	1		
8. Depression	0.39	0.16	0.17	0.25	0.18	0.24	0.19	1	
9. Social Deviance	0.31	0.19	0.25	0.28	0.22	0.12	0.13	0.15	1

BGII: Bender Gestalt Test II, MMPI-2: Minnesota Multiphasic Personality Inventory-2.

Findings from **Table 6** indicate that the BGII exhibits good to acceptable concurrent validity for assessing and diagnosing psychological traits such as Schizophrenia, Depression, Psychopathy (Weakness of Mind), Anxiety, and Social Deviance, as evidenced by significant positive correlations with their corresponding MMPI-2 scales.

However, the BGII shows limited validity and lower accuracy for traits including Hypomania, Paranoia, Hysteria, and Hypochondria. For these characteristics, complementary clinical evaluations and additional psychometric instruments are recommended to ensure a comprehensive assessment.

4- DISCUSSION

The primary objective of this study was to examine the pattern of error score changes in the Bender Visual-Motor Gestalt Test II (BGII) during adolescence and to evaluate the validity and efficacy of the test in identifying psychological traits and symptoms among students aged 12 to 19 in Jolfa. The findings indicate that the BGII is an effective and practical tool for screening and assessing personality and psychological disorders in adolescents, although some limitations in its clinical application should be acknowledged.

The pattern of error changes across adolescence followed a distinct nonlinear trajectory, with errors increasing until age 15, gradually decreasing until age 18, and then significantly rising again after age 18. This fluctuation likely reflects the complex psychological and neurological developmental processes occurring during puberty and aligns with prior research in developmental psychology and neuropsychology (22–24). The elevated error rates observed at ages 15 and 19 may correspond to critical phases of psychological stress, identity challenges, and brain maturation, which can negatively impact adolescents' executive and perceptual functioning. Moreover, the notable variability in error scores at age 15 underscores substantial individual differences in responses to developmental and environmental factors affecting cognitive performance (25–27).

Confirmatory factor analysis supported a five-factor structure for the BGII, comprising anxiety, schizophrenia, obsessive-compulsive disorder, depression, and aggression. This structure demonstrates the test's capacity to effectively capture diverse psychological dimensions in adolescents. Sensitivity and specificity analyses showed acceptable accuracy in identifying psychological disorders, particularly schizophrenia and obsessive-compulsive traits. Furthermore, significant positive correlations between BGII scores and corresponding MMPI-2 subscales reinforced the concurrent validity of the BGII, supporting its use as a complementary instrument for adolescent personality assessment.

From a theoretical standpoint, these findings align with cognitive and developmental frameworks. In schizophrenia, deficits in perceptual integration cause individuals to perceive their environment as fragmented rather than cohesive, resulting in increased errors and distortions on the BGII. Disruptions in gestalt processing among individuals with schizophrenia are well documented (28–31). In contrast, depression is characterized by decreased self-efficacy, negative self and environmental views, and psychomotor slowing, leading to simplified stimuli processing and brief, less accurate responses (32, 33).

Additional theoretical and empirical studies suggest that aggression and obsessive-compulsive traits, as measured by the BGII, correspond with cognitive-behavioral models. Aggressive individuals often interpret stimuli with hostility, resulting in errors such as rotations, omissions, and spatial displacements (34). Individuals with obsessive-compulsive traits tend to display repetitive worry, excessive attention to detail, and repetitive behaviors, which manifest as slowed and uniform responses during testing (35, 36). These patterns further confirm the BGII's sensitivity and accuracy in detecting complex psychological features in adolescents.

Practically, previous research by Yousefi et al. (10) confirmed the reliability and stability of the BGII for assessing cognitive-motor functions in Iranian adolescents, while international studies such as Marnic (9) highlighted the test's utility in screening disorders like ADHD, though noting some limitations in diagnosing more complex conditions. Therefore, it is recommended that the BGII be used in conjunction with complementary tools, such as the MMPI-2 and comprehensive clinical evaluations, to enhance diagnostic precision and thoroughness (37–41).

4-1. Study Limitations and Suggestions

This study's cross-sectional design limits the ability to infer causal relationships among the examined variables. Additionally, the sample was drawn from a single city within a specific cultural context, which may reduce the generalizability of the findings to broader or more diverse populations. While the Bender Gestalt Test II (BGII) is a valuable tool for assessing visual-motor integration and related psychological traits, it does not provide definitive diagnoses for a wide range of psychological disorders and should be used alongside other psychometric instruments and comprehensive clinical evaluations. For future research, longitudinal study designs are recommended to better explore developmental trajectories and causal mechanisms. Furthermore, including culturally diverse and larger samples would enhance understanding of biological and environmental influences on test performance, ultimately improving the BGII's accuracy, applicability, and clinical utility across varied populations.

5- CONCLUSION

The present study confirms that the Bender Visual-Motor Gestalt Test II (BGII) is a valid, reliable, and robust instrument for assessing and identifying core personality traits in adolescents aged 12 to 19 years. The test effectively captures key psychological dimensions—including aggression, schizophrenia, anxiety, and depression—supported by a well-defined five-factor structure validated through confirmatory factor analysis. Observed fluctuations and nonlinear patterns in test performance, particularly the notable increases at ages 15 and 19, reflect the complex and multidimensional psychological, cognitive, and identity-related processes characteristic of this critical developmental period, influenced

by the psychosocial stressors inherent in adolescence.

Despite the BGII's demonstrated strong validity, certain limitations were noted in detecting traits such as hysteria, hypochondriasis, hypomania, and social introversion. These limitations warrant cautious interpretation and underscore the importance of using the BGII in conjunction with complementary psychometric instruments and comprehensive clinical evaluations to enhance diagnostic accuracy and comprehensiveness. Therefore, integrating the BGII within a multimodal assessment framework is recommended to maximize its clinical and research utility.

6- ACKNOWLEDGMENTS

This article is derived from a Master's thesis in Clinical Psychology. We would like to express our sincere gratitude to all the students and their parents in Jolfa city who generously participated in this study. Without their cooperation and support, this research would not have been possible. We also extend our heartfelt thanks to the Psychology Department and Islamic Azad University, Tabriz Branch for their comprehensive support throughout this work.

7- CONFLICT OF INTEREST: None.

8- REFERENCES

1. Bender, L. A Visual-Motor Gestalt Test and Its Clinical Use. American Ortho Psychiatric Association Monograph Series Number 3, 1938. American Orthopsychiatric Association, NY.

Bahrami, H. Psychological Tests: Theoretical Foundations and Practical Techniques (6th ed.). Tehran: Allameh Tabataba'i University Press, 2012.

3. Korkmaz M, Sapmaz-Yurtsever S, Kaçar-Başaran S, Demiral N, Çabuk T. Bender-Gestalt II Test: Psychometric Properties with Global Scoring System on a Turkish Standardization Sample. Child Neuropsychol. 2023 May;29(4):607-627. doi: 10.1080/09297049.2022.2104237. Epub 2022 Jul 28. PMID: 35899401.

4. Sadaghi, Z., Hashemi Azar, J., & Kazemi, F. Neuropsychological performance of students with learning disabilities, externalizing and internalizing disorders on the Wechsler scale and the Bander Gestalt test. *Special Children*, 2014; 4(54):23-35.

5. Pietroski, M. Clinical and Research Applications of the Bender Gestalt Test. American Psychologist, 1955;10: 1272.

6. Fernández, T., & Tuset, A. M. (2007). Bender Performance and Socioeconomic Status in Mexican Children: A Cross-Cultural Study. Perceptual and Motor Skills, *105*(3), 906-
914. https://doi.org/10.2466/pms.105.3.906-914 (Original work published 2007)

7. Cobrinik L. The Bender Gestalt test in childhood emotional disorder. Psychiatr Q. 1988 Fall;59(3):235-43. doi: 10.1007/BF01064246. PMID: 3237891.

8. Javanmard, G. H., Mahmod Alilo, M., Ahmadi, P., Babapour, J., Ranjbar, F. Performance of a Schizophrenic Patient Group with Negative and Positive Symptoms on Bender-Gestalt Neuropsychological Test and Correlation of Its Scores with Performance on Wisconsin Card Sorting Test. Journal of Modern Psychological Researches, 2008; 3(10): 41-59.

9. Allen RA, Decker SL. Utility of the Bender Visual-Motor Gestalt Test-Second Edition in the assessment of attention-deficit/hyperactivity disorder. Percept Mot Skills. 2008 Dec;107(3):663-75. doi: 10.2466/pms.107.3.663-675. PMID: 19235398.

10. Yousefi F, Shahim S, Razavieh A, Mehryar AH, Hosseini AA, Alborzi S. Some normative data on the Bender Gestalt test performance of Iranian children. Br J Educ Psychol. 1992 Nov;62 (Pt 3):410-6. doi: 10.1111/j.2044-8279.1992.tb01034.x.

11. Tirgari A. lacks scoring system in 1984 . J Mazandaran Univ Med Sci 2000; 10 (26): 38-44. http://jmums.mazums.ac.ir/article-1-288-fa.html.

12. Rezaie nasab, tayebeh, Salehi, I., Kafi, S. M., & Rezaei, S. The Validity, Diagnostic Value and Replicability of Bender Visual-Motor Gestalt Test in Traumatic Brain Injury Patients. Bimonthly Journal of Hormozgan University of Medical Sciences, 2014;18(4): 297–308.

13. Relationship between personality and health symptoms: Use of the MMPI-2 in medical assessments

14. McCord, D. M. Overview of the MMPI–2–RF: History, development, and psychometric considerations. In D. M. McCord, *Assessment using the MMPI-2-RF* (pp. 7–17). American Psychological Association, 2018. https://doi.org/10.1037/0000074-002.

15. Habibi M, Dehghani M, Jebraeili H, Javaheripou N. Comparing the psychological profiles of Iranian population based on clinical and validity measures of Minnesota multiphasic personality inventory. J Research Health 2017; 7(6):1130-37. http://jrh.gmu.ac.ir/article-1-652-en.html.

16. Zahra Ghamkhar Fard, Abbas Pourshahbaz, Shima Shakiba, & Arash Mirabzadeh. Utility of MMPI-2-RF in Differentiating Criterion B of DSM–5 Alternative Model of Personality Disorders on an Iranian Clinical Sample. International Journal of Indian Psychology, 2022;10(1). https://doi.org/10.25215/1001.010.

17. Valianpour, Z., Modarres Gharavi, M., Mahram, B. Validation of the Minnesota Multiphasic Personality Inventory (MMPI 2) in psychiatric patients and non-patient individuals in Mashhad city, Iran. Fundamentals of Mental Health, 2020; 22(6): 399-407. doi: 10.22038/jfmh.2020.17815

18. Guadalupe Sánchez, Amada Ampudia, Fernando Jiménez, Bárbara G. Amado. Contrasting the efficacy of the MMPI-2-RF overreporting scales in the detection of malingering. The European Journal of Psychology Applied to Legal Context. 2017; 9(1): 57-66.

19. Department of Health, Education, and Welfare; National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The Belmont Report. Ethical principles and guidelines for the protection of human subjects of research. J Am Coll Dent. 2014 Summer;81(3):4-13. PMID: 25951677.

20. Streiner, D. L., Norman, G. R., & Cairney, J. Health Measurement Scales: A Practical Guide to Their Development and Use (5th ed.). New York: Oxford University Press, 2015. https://doi.org/10.1093/med/9780199685219.001.0001.

21. Kaplan, R. M., & Saccuzzo, D. P. Psychological Testing: Principles, Applications, and Issues. Cengage Learning, 2017.

22. Steinberg, L. Age of Opportunity: Lessons from the New Science of Adolescence. Houghton Mifflin Harcourt, USA, 2014.

23. Casey BJ, Jones RM, Hare TA. The adolescent brain. Ann N Y Acad Sci. 2008 Mar;1124:111-26. doi: 10.1196/annals.1440.010. PMID: 18400927; PMCID: PMC2475802.

24. Choudhury, Suparna, Dahl, Ron, Luna, Beatriz, Lupien, Sonia J., Noble, Kimberly, Suleiman, Ahna, et al. The Adolescent Brain: A second window of opportunity. UNICEF Office of Research – Innocenti, 2017. https://hdl.handle.net/20.500.12799/5746.

25. Brannigan, G. and Decker, S. (2003) Bender Gestalt II: Bender Visual-Motor Gestalt Test Second Edition. Examiner's Manual, The Riverside Publishing Company, USA.

26. Lafhal H, Ahami AOT, Chafik K, Goutou S, Atmane R. The Bender-Gestalt Test: A Systematic Review. Cureus. 2025 Mar 24;17(3):e81122. doi: 10.7759/cureus.81122. PMID: 40291285; PMCID: PMC12022457.

27. Anderson VA, Anderson P, Northam E, Jacobs R, Catroppa C. Development of executive functions through late childhood and adolescence in an Australian sample. Dev Neuropsychol. 2001;20(1):385-406. doi: 10.1207/S15326942DN2001_5. PMID: 11827095.

28. McCutcheon RA, Keefe RSE, McGuire PK. Cognitive impairment in schizophrenia:

aetiology, pathophysiology, and treatment. Mol Psychiatry. 2023 May;28(5):1902-1918. doi: 10.1038/s41380-023-01949-9. Epub 2023 Jan 23. Erratum in: Mol Psychiatry. 2023 May;28(5):1919. doi: 10.1038/s41380-023-01984-6. PMID: 36690793; PMCID: PMC10575791.

29. Uhlhaas PJ, Silverstein SM. Perceptual organization in schizophrenia spectrum disorders: empirical research and theoretical implications. Psychol Bull. 2005 Jul;131(4):618-632. doi: 10.1037/0033-2909.131.4.618. PMID: 16060805.

30. Silverstein SM, Keane BP. Perceptual organization impairment in schizophrenia and associated brain mechanisms: review of research from 2005 to 2010. Schizophr Bull. 2011 Jul;37(4):690-9. doi: 10.1093/schbul/sbr052. PMID: 21700589; PMCID: PMC3122298.

31. Butler PD, Silverstein SM, Dakin SC. Visual perception and its impairment in schizophrenia. Biol Psychiatry. 2008 Jul 1;64(1):40-7. doi: 10.1016/j.biopsych.2008.03.023. PMID: 18549875; PMCID: PMC2435292.

32. Wright JH, Beck AT. Cognitive therapy of depression: theory and practice. Hosp Community Psychiatry. 1983 Dec;34(12):1119-27. doi: 10.1176/ps.34.12.1119. PMID: 6642458.

33. Gotlib IH, Joormann J. Cognition and depression: current status and future directions. Annu Rev Clin Psychol. 2010;6:285-312. doi: 10.1146/annurev.clinpsy.121208.131305. PMID: 20192795; PMCID: PMC2845726.

34. Dodge, K. A., Coie, J. D., & Lynam, D. Aggression and Antisocial Behavior in Youth. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), Handbook of child psychology: Social, emotional, and personality development (6th ed., 2006; pp. 719–788). John Wiley & Sons, Inc..

35. Stein DJ, Costa DLC, Lochner C, Miguel EC, Reddy YCJ, Shavitt RG, van den Heuvel OA, Simpson HB. Obsessive-compulsive disorder. Nat Rev Dis Primers. 2019 Aug 1;5(1):52. doi: 10.1038/s41572-019-0102-3. Erratum in: Nat Rev Dis Primers. 2024 Oct 16;10(1):79. doi: 10.1038/s41572-024-00569-z. PMID: 31371720; PMCID: PMC7370844.

36. Taylor, S., Abramowitz, J. S., & McKay, D. Cognitive-Behavioral Models of Obsessive-Compulsive Disorder. In M. M. Antony, C. Purdon, L. J. Summerfeldt (Eds.), Psychological treatment of obsessive-compulsive disorder: Fundamentals and beyond (pp. 9–29). American Psychological Association, 2007. doi.org/10.1037/11543-001.

37. Groth-Marnat, G., & Wright, A. J. Handbook of Psychological Assessment (6th ed.) Wiley Publishers, 2016. Available from: https://colegiopspchubut.com.ar/storage/2023/02/GARY-GROTH-MARNAT.pdf.

38. Rajabi, G. R., Najarian, B., & Hadianfard, H. Gestalt Visual Motor Test on 6- to 11-year-old children in Zahedan. Psychology, 1999; 10:174-91.

39. Arabzadeh M, Joshany A. Psychometric Properties of Bender – Gestalt (II) Test In Primary School Students. J of Psychology, 2024; 27(4):416-26.

40. Bahramian, A., Hadianfard, H., Mohamadi, N., Rahimi, C. Standardization of Bender-Gestalt II in Children Aged between 4 and 11 Years in Shiraz. Quarterly of Educational Measurement, 2013; 4(11): 170-195.

41. Tahmasebi S, Mafakheri Bashmaq S, Emad-al-din A, Rezaei R. Normalizing the Bender Visual-Motor Gestalt Test for 4 to 7 Years Old Children of Tehran, Iran. jrehab 2016; 17(1): 20-31. URL: http://rehabilitationj.uswr.ac.ir/article-1-1670-fa.html.