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OPEN PEER REVIEW

Persian Handwriting Assessment Tool: Reliability in Students with Specific Learning Disorders

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About this report

This open peer review (OPR) report shows the public comments made on this article during peer review, by the reviewers, the associate editor and the editor-in-chief, for every revision round, together with the authors' replies. Comments appear only with the consent of the people who wrote them. Reviewers who chose to sign their report are named; the others are shown as "Referee". Comments are edited for language only, and confidential remarks to the editors are not included.

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1 Original submission

4 comments · 28 Jul 2023 – 13 Aug 2023

Referee 1 Reviewer

MAJOR REVISION 28 Jul 2023

Subject: Review of Manuscript entitled "Persian Handwriting Assessment Tool: Reliability in Students with Specific Learning Disorder"

I am writing to provide my review of the manuscript titled "Persian Handwriting Assessment Tool: Reliability in Students with Specific Learning Disorder." I commend you for your valuable contribution to the field of handwriting assessment in children with specific learning disorder.

General Evaluation:
The manuscript is well-written and presents a comprehensive investigation into the reliability of the Persian Handwriting Assessment Tool (PHAT) in children with specific learning disorder aged 10 to 12 years. The study's objectives and methodology are appropriately described, and the statistical analysis is sound. The results are well-organized and supported by relevant data. Overall, your study addresses an essential area of research and provides valuable insights for clinicians and educators.

Specific Comments:
Abstract
Background: It would be helpful to provide a sentence or two about the importance of reliable assessment tools in addressing these difficulties.
Objectives: The objective of the study is stated clearly. However, consider expanding on the significance of investigating the reliability of the Persian Handwriting Assessment Tool (PHAT) for children with SLD aged 10 to 12 years, especially in the Iranian context.
Conclusion: The conclusion summarizes the main finding, but consider mentioning the practical implications of the study's results. Specifically, highlight how the reliable PHAT can benefit clinicians in identifying handwriting difficulties in children with SLD aged 10 to 12 years and how this can lead to more targeted interventions.
Introduction
The introduction could benefit from providing more specific background information about specific learning disorder (SLD) and how it relates to handwriting difficulties.
Material and methods
However, it would be beneficial to specify how the diagnosis of SLD was confirmed, whether it was based on standardized criteria or assessments.
While the number of participants (N=30) is provided, it would be helpful to mention how the sample size was determined or refer to the source (literature) that recommends using at least 30 participants for examining reliability.
It would be useful to include a brief explanation of how the scoring system works for each component (formation, alignment, space, and text slant) to help readers understand how the handwriting legibility and orthographic error are assessed.
Mentioning the development and validation of the PHAT by Havaei et al. (reference 12) adds credibility to the measure.
However, it would be helpful to elaborate on the data collection process, such as how the dictation task was administered and how the scoring was done using the Likert scales.
The description of the equipment used for the test is helpful, but it would be beneficial to specify the type of lined paper used for the dictation domain. Additionally, if there were any specific dimensions or characteristics of the paper, that information could be included.

Mentioning the appropriate height of the desk is relevant, but it might be useful to elaborate on how the appropriate height was determined to ensure consistency in the testing conditions.
The description of the test administration is clear, but it could be expanded to include specific instructions given to the students before starting the test. For example, were they given any practice trials to familiarize themselves with the task?
The study mentions an experienced occupational therapist conducting the test twice with a two-week interval for test-retest reliability. It would be helpful to mention whether the test was administered to all participants in the same order, and if there were any specific guidelines for preventing potential learning effects or memory biases during the second administration.
While it is mentioned that two other occupational therapists with at least 5 years of experience in working with students with SLD scored the test for inter-rater reliability, it would be beneficial to add more details on any guidelines or training provided to ensure consistency in scoring between the two raters.
Statistical analysis
However, it would be helpful to provide references for the methods cited (e.g., references for Cronbach's alpha, ICC, and SEM).
The version of the SPSS software used should be specified, as different versions may have variations in analysis capabilities.
Results
Reporting ICC Confidence Intervals: For ICC values, it is common practice to report 95% confidence intervals, in addition to point estimates. This provides a range within which the true reliability estimate is likely to fall. Including confidence intervals would strengthen the interpretation of the reliability results.
It would be more informative to provide explicit thresholds or criteria for what is considered "satisfactory" or "acceptable" in the context of this study. Reference to previous literature or established standards would be helpful in this regard.
Specify the location of the tables in the text.
Discussion
Consider using subheadings in the "Discussion" section to divide the content into subsections. This will improve the organization and make it easier for readers to navigate through the different aspects of the discussion.
While the authors acknowledge the limitation of recruiting participants during the COVID-19 pandemic, it would be beneficial to discuss how this limitation might have influenced the study's results or generalizability. Additionally, other potential limitations, such as sample size or selection bias, could be mentioned for a more comprehensive assessment of the study's limitations.
It would be valuable to compare the reliability results of the PHAT with other handwriting assessment tools that have been validated in similar age groups and populations. This would further establish the strengths of the PHAT in comparison to existing measures.
Clinical Implications: The discussion could benefit from a section discussing the practical implications of the study's findings for clinicians and educators working with students with SLD. How can the high reliability of the PHAT contribute to more accurate assessments and targeted interventions?
Limitation of Likert Scale: While the authors discuss the excellent inter-rater reliability of the PHAT, it might be worth mentioning the inherent limitation of using a Likert scale for subjective assessments. A Likert scale, although providing some level of standardization, may still involve varying degrees of subjectivity in scoring.

Referee 2 Reviewer

MAJOR REVISION 31 Jul 2023

The following comments concern the manuscript titled " Persian Handwriting Assessment Tool: Reliability in Students with Specific Learning Disorder" submitted to Middle East Journal of Rehabilitation and Health

Studies for consideration. Overall, the study presents some interesting findings; however, there are several aspects that need to be addressed before the manuscript can be considered for publication. I have provided detailed comments below:
-Review the manuscript for any grammatical or formatting errors to ensure the text is clear and polished.

Introduction:

-Emphasize the significance of assessing the reliability of PHAT in diverse groups, such as older students (10 to 12 years) with SLD.
-While you briefly mention that few studies have examined the psychometric features of PHAT, try to elaborate on the existing research gaps in the literature related to handwriting assessment tools for older students with SLD.
It is crucial to provide more specific and comprehensive background information about specific learning disorder (SLD) and its connection to handwriting difficulties.

Materials & Methods:

- In the inclusion criteria, it is essential to specify how intelligence was measured and how developmental or neurologic comorbidities and the absence of uncorrectable visual and hearing problems were determined, to ensure transparency.
- In the exit criteria, how were concentration problems identified?

-Include additional information about how participants were recruited from the five learning disorder centers in Tehran. Mention any specific criteria or process used to select these centers and ensure that the sample is representative of the target population.

-In addition to mentioning the total number of participants and the gender distribution, consider providing more demographic details, such as the mean age and standard deviation of the participants, as well as any other relevant characteristics (e.g., grade level distribution).

-Clarify the scoring process for the PHAT. Mention whether the scoring was conducted in real time during the testing sessions or later through video recordings. If there were any specific guidelines or rubrics for scoring the handwriting legibility and orthographic errors, include this information to ensure transparency.

-Emphasize the efforts taken to standardize testing conditions, including room lighting, ventilation, and other environmental factors. Additionally, if there were any specific instructions given to participants during the testing sessions, briefly mention them.

- Authors should specify what words and standard text they used.

-In the statistical analysis section, provide the correct version number of the SPSS software used for data analysis.
Results:
-It would be beneficial to provide a more detailed description of participant characteristics, such as the mean age, standard deviation, and the grade distribution within the sample. However, it would be beneficial to include the range of ages within the sample to provide a more comprehensive understanding of the age distribution.

-The small SEM and MDC values obtained for both the copying and dictation domains further support the reliability of the PHAT. Consider providing a brief explanation of what these values represent, i.e., the level of measurement error and the minimal detectable change in handwriting performance.
Discussion

-It would be valuable to compare these results with previous studies that have investigated the reliability of other handwriting assessment tools in similar age groups. This will provide a broader context for

understanding the reliability of the PHAT in comparison to existing tools.

-In the discussion section, consider elaborating on the clinical implications of the results. How does the good-to-excellent reliability of the PHAT impact its practical use in identifying handwriting difficulties in children with SLD? How might occupational therapists and educators utilize this tool effectively based on the demonstrated reliability?

-While you mention that the inter-rater reliability of the PHAT was excellent, discuss how having raters with similar expertise and specialty may have contributed to the high inter-rater reliability.

-Regarding the limitation mentioned at the end of the results section, explain how the recruitment during the COVID-19 pandemic might have affected the study's results or implications. Were there any specific challenges or adaptations made during data collection due to the pandemic?
- What are some areas that could be further explored in relation to handwriting assessment and interventions for students with SLD?
-Consider providing suggestions for future research directions. For example, you could propose investigating the validity of the PHAT by comparing its results with other established measures of handwriting or exploring its sensitivity in detecting changes in handwriting skills over time with intervention.
It would be beneficial to briefly discuss the strengths of the PHAT, especially in comparison to other handwriting assessment tools. Highlight any unique features or advantages that the PHAT offers, which contribute to its excellent reliability in this specific population.

-Discuss the potential impact of using the PHAT in educational settings. How could teachers or educators benefit from incorporating this tool into their assessments or interventions for students with SLD? Address the practical implications and feasibility of implementation in such settings.

-In the conclusion section, elaborate on the clinical significance of having a reliable tool like PHAT for occupational therapists working with children with SLD. Discuss how the availability of a validated assessment tool can lead to earlier identification and intervention for handwriting difficulties, potentially improving academic performance and overall well-being of these students.

Associate Editor

MAJOR REVISION 12 Aug 2023

Dear Editor-in-Chief

The manuscript entitled "Persian Handwriting Assessment Tool: Reliability in students with specific learning disorder" was assessed by two reviewers and me. Based on the reviewers' comments, the manuscript needs Major revision.

Kind regards

Editor-in-Chief

MAJOR REVISION 13 Aug 2023

Dear Authors
According to the reviewers' and associate editor's comments, your article needs major revision. When revising your manuscript, please consider all issues mentioned in the reviewers' comments carefully: please outline every change made in response to their comments and submit the required files.

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Revision 1

AUTHORS' RESPONSE TO REVIEWERS

Authors' reply to reviewers

The next pages contain the authors' point-by-point reply to the comments of this revision round, as submitted with the revised manuscript. It is published as the authors wrote it.

Manuscript ID: 139317

Reviewer 1

Dear professor,

I appreciate your time and consideration. Thank you for your valuable comments and I will be more than glad to provide you with further details. The edited parts are highlighted in manuscript word file with blue color.

Sincerely yours,

Abstract

1. Background: it would be helpful to provide a sentence or two about the importance of reliable assessment tools in addressing these difficulties: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**
2. Objectives: The **objective** of the study is stated clearly. However, consider expanding on the significance of investigating the reliability of the Persian Handwriting Assessment Tool (PHAT) for children with SLD aged 10 to 12 years, especially in the Iranian context: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**
3. Conclusion: The conclusion summarizes the main finding, but consider mentioning the practical implications of the study's results. Specifically, highlight how the reliable PHAT can benefit clinicians in identifying handwriting difficulties in children with SLD aged 10 to 12 years and how this can lead to more targeted interventions: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**

Introduction

1. The introduction could benefit from providing more specific background information about specific learning disorder (SLD) and how it relates to handwriting difficulties: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**

Material and methods

1. However, it would be beneficial to specify how the diagnosis of SLD was confirmed, whether it was based on standardized criteria or assessments: **Edited and highlighted. diagnosis of SLD was confirmed according to child and adolescent psychiatrist.**
2. While the number of participants (N=30) is provided, it would be helpful to mention how the sample size was determined or refer to the source (literature) that recommends using at least 30 participants for examining reliability: **We appreciate the reviewer's attention to the sample size in our study. The sample size of 30 participants was determined based on established guidelines in the literature for examining reliability. Specifically, it is**

widely recommended in the literature, as referenced in our study , that a minimum of 30 participants is necessary to assess reliability in methodological studies of this nature. These guidelines ensure a sufficient sample to detect reliability estimates with adequate precision.

3. It would be useful to include a brief explanation of how the scoring system works for each component (formation, alignment, space, and text slant) to help readers understand how the handwriting legibility and orthographic error are assessed. Mentioning the development and validation of the PHAT by Havaei et al. (reference 12) adds credibility to the measure. However, it would be helpful to elaborate on the data collection process, such as how the dictation task was administered and how the scoring was done using the Likert scales: **The time to copy 12 words (speed) was recorded and used to calculate the number of letters written per minute with the following formula: Number of letters/number of seconds=χ/60. Orthographic errors were recorded in the dictation domain with the number of wrong words. Legibility has four components include word formation, spacing, alignment and text slant. Each word was scored with a five-point Likert scale (from 1: very poor to 5: very good). Size was scored differently from 1: very small to 5: very large, and number 3 considered as the best score. Finally, the average score of the twelve words for the copying and dictation domains was considered as the participant's total score in each eligibility's components.**
4. The description of the equipment used for the test is helpful, but it would be beneficial to specify the type of lined paper used for the dictation domain. Additionally, if there were any specific dimensions or characteristics of the paper, that information could be included**: The required equipment was a pencil (HB lead), an eraser, a sharpener, a clipboard, a preprinted A4-size lined paper, and an anti-slip cover on the table to prevent extra movement of the clipboard. The clipboard was slanted for providing participants with a better pencil grasp and a parallel state of the forearm of the writing hand to the table.**
5. Mentioning the appropriate height of the desk is relevant, but it might be useful to elaborate on how the appropriate height was determined to ensure consistency in the testing conditions: **PHAT was performed in a quiet and well-lit room. Each student was asked to sit behind a desk. Desk and chairs were appropriate based on the participant's height to control the ergonomic factors.**
6. The description of the test administration is clear, but it could be expanded to include specific instructions given to the students before starting the test. For example, were they given any practice trials to familiarize themselves with the task? **There was no any practice trial. The students were asked to "read the words and then immediately write them using good handwriting". The time each student took to complete the copy assignment was recorded. In the next step, the occupational therapist pronounced words loudly and expressively and gave the students enough time to write the words**
7. The study mentions an experienced occupational therapist conducting the test twice with a two-week interval for test-retest reliability. It would be helpful to mention whether the test was administered to all participants in the same order, and if there were any specific guidelines for preventing potential learning effects or memory biases during the second

administration: **Edited and highlighted**. **According to similar articles and PHAT manual for handwriting assessment more than two week interval between test and re-test is forbidden due to developmental change.**

8. While it is mentioned that two other occupational therapists with at least 5 years of experience in working with students with SLD scored the test for inter-rater reliability, it would be beneficial to add more details on any guidelines or training provided to ensure consistency in scoring between the two raters: **Both examiners received scoring education. Edited and highlighted**

Statistical analysis

1. However, it would be helpful to provide references for the methods cited (e.g., references for Cronbach's alpha, ICC, and SEM): **References number 18, 20 and 21 are highlighted in the main script.**
2. The version of the SPSS software used should be specified, as different versions may have variations in analysis capabilities: **SPSS 27 was used. Edited and highlighted.**

Results

1. Reporting ICC Confidence Intervals: For ICC values, it is common practice to report 95% confidence intervals, in addition to point estimates. This provides a range within which the true reliability estimate is likely to fall. Including confidence intervals would strengthen the interpretation of the reliability results: **Thank you for your feedback. We appreciate your suggestion regarding the inclusion of 95% confidence intervals (CIs) for the Intraclass Correlation Coefficients (ICCs) in our manuscript. We are pleased to confirm that we have already provided the 95% CIs for the ICC values in our final manuscript. This addition enhances the interpretation of the reliability results and ensures that readers have a clear understanding of the precision associated with our estimates. We believe that the inclusion of these confidence intervals strengthens the quality and comprehensiveness of our research findings.**
2. It would be more informative to provide explicit thresholds or criteria for what is considered "satisfactory" or "acceptable" in the context of this study. Reference to previous literature or established standards would be helpful in this regard: **We recognize the importance of providing clear criteria for what is considered "satisfactory" or "acceptable" in the context of our study to enhance the transparency and interpretability of our results.**

   In response to this valuable suggestion, we have taken steps to provide explicit thresholds for the interpretation of our reliability measures. We have incorporated established criteria outlined by Plitcha SB (2013), which are widely recognized in the field for assessing internal consistency (Cronbach's alpha) and reliability (ICC, SEM, MDC). These criteria were thoughtfully applied to our findings, ensuring that readers have a well-defined framework for evaluating the quality of our results.

By including these explicit criteria, we believe that our manuscript now offers a more comprehensive and informative assessment of the reliability and consistency of our study's outcomes. We are committed to making our research findings as accessible and transparent as possible to the scientific community.

3. Specify the location of the tables in the text: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**

Discussion

1. Consider using subheadings in the "Discussion" section to divide the content into subsections. This will improve the organization and make it easier for readers to navigate through the different aspects of the discussion: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**
2. While the authors acknowledge the limitation of recruiting participants during the COVID-19 pandemic, it would be beneficial to discuss how this limitation might have influenced the study's results or generalizability. Additionally, other potential limitations, such as sample size or selection bias, could be mentioned for a more comprehensive assessment of the study's limitations: **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**
3. It would be valuable to compare the reliability results of the PHAT with other handwriting assessment tools that have been validated in similar age groups and populations. This would further establish the strengths of the PHAT in comparison to existing measures: **We appreciate the valuable feedback provided by the reviewer. Comparing the reliability results of the Persian Handwriting Assessment Tool (PHAT) with other established handwriting assessment tools is an essential aspect of evaluating its utility and effectiveness. To address this suggestion, we have conducted a comparative analysis with several commonly used handwriting assessment tools validated in similar age groups and populations.**

   In our discussion, we highlighted the strengths and unique contributions of the PHAT concerning reliability compared to other tools. This comparative analysis aimed to provide a comprehensive perspective on how the PHAT stands out in assessing handwriting difficulties, particularly within the specific context of specific learning disorders (SLD).

   We have incorporated references to the relevant literature and discussed the specific aspects in which the PHAT excels, such as its detailed evaluation of legibility and speed, the separation of components, and its excellent reliability within a two-week timeframe. This approach allows for a more precise understanding of a child's handwriting difficulties, potentially aiding clinicians and educators in tailoring interventions to individual needs.

4. Clinical Implications: The discussion could benefit from a section discussing the practical implications of the study's findings for clinicians and educators working with students with SLD. How can the high reliability of the PHAT contribute to more accurate assessments

and targeted interventions? **We appreciate the valuable feedback provided by the reviewer. It was edited and highlighted**

5. Limitation of Likert Scale: While the authors discuss the excellent inter-rater reliability of the PHAT, it might be worth mentioning the inherent limitation of using a Likert scale for subjective assessments. A Likert scale, although providing some level of standardization, may still involve varying degrees of subjectivity in scoring: **We appreciate the reviewer's insightful comment regarding the limitation of using a Likert scale for subjective assessments, and we agree that it is an important aspect to consider in the context of our study on the Persian Handwriting Assessment Tool (PHAT).**

   Indeed, Likert scales, while valuable for introducing a degree of standardization into subjective assessments, are not entirely free from subjectivity. Scoring on a Likert scale can be influenced by individual judgment, and there may be some variability in how different raters interpret and assign scores to the same handwriting samples. This limitation is inherent in any assessment tool employing subjective judgment, including the PHAT.

   To address this concern and provide a more comprehensive understanding of the PHAT's reliability and its potential limitations, we have now included a brief discussion of this issue in the manuscript:

   "Limitation of Likert Scale:

   While the PHAT demonstrates excellent inter-rater reliability, it is essential to acknowledge that the use of a Likert scale for subjective assessments introduces a level of subjectivity into the scoring process.

   Despite efforts to standardize the criteria and provide clear guidelines to raters, variations in individual judgment may still occur.

   Future research and refinements of the PHAT may explore ways to further minimize subjectivity in scoring, potentially through additional training of raters or refining the scoring criteria."

   We believe that this addition addresses the reviewer's valid point and provides a more balanced discussion of the PHAT's reliability, taking into consideration the inherent limitations of Likert scales in subjective assessments.

Reviewer 2

Dear professor,

I appreciate your time and consideration. Thank you for your valuable comments and I will be more than glad to provide you with further details. The edited parts are highlighted in manuscript word file with yellow color.

Sincerely yours,

1. Review the manuscript for any grammatical or formatting errors to ensure the text is clear and polished: **Thank you for your valuable feedback. We have thoroughly reviewed the manuscript for grammatical and formatting errors to ensure clarity and polish, and have made the necessary revisions.**

Introduction:

2. Emphasize the significance of assessing the reliability of PHAT in diverse groups, such as older students (10 to 12 years) with SLD**: Thank you for your valuable feedback. We acknowledge the importance of assessing the reliability of the Persian Handwriting Assessment Tool (PHAT) in diverse groups, including older students (10 to 12 years) with Specific Learning Disorder (SLD). In our study, we aimed to fill this gap in the literature by examining the internal consistency, test-retest reliability, and inter-rater reliability of the PHAT specifically in this age group and population. This investigation is essential to ensure the broader applicability and reliability of the PHAT for assessing handwriting difficulties in various contexts. We emphasized it in introduction and highlighted it as well.**
3. While you briefly mention that few studies have examined the psychometric features of PHAT, try to elaborate on the existing research gaps in the literature related to handwriting assessment tools for older students with SLD: **We sincerely appreciate the reviewer's astute observations and valuable feedback regarding our manuscript. We acknowledge the importance of elucidating the research gaps in the literature related to handwriting assessment tools for older students confronted by specific learning disorders (SLD). In response to this constructive input, we have enriched the**

introduction section by providing a more comprehensive overview of these research gaps.

By extending the discussion on the existing literature, we have aimed to underscore the relevance and significance of our study, which seeks to address these critical gaps in the context of the Persian Handwriting Assessment Tool (PHAT). This revision now offers readers a clearer understanding of the rationale behind our investigation and the unique contribution it makes to the field of handwriting assessment, particularly among older students with SLD.

4. it is crucial to provide more specific and comprehensive background information about specific learning disorder (SLD) and its connection to handwriting difficulties: **We appreciate your valuable feedback and have taken it into careful consideration. In response to your suggestion, we have enriched the introduction section by incorporating specific and comprehensive information about Specific Learning Disorders (SLD) and their connection to handwriting difficulties.**

Material & Methods:

5. In the inclusion criteria, it is essential to specify how intelligence was measured and developmental or neurologic comorbidities, absence of uncorrectable visual and hearing problems were determined, to ensure transparency**: we have incorporated the suggested clarification into the inclusion criteria section of the Materials and Methods. The revised statement now explicitly outlines how the inclusion criteria were verified through a comprehensive process, including a review of academic records, rehabilitation history, and clinical evaluations. This modification enhances the transparency and clarity of the inclusion criteria. Thank you for your valuable input, which has contributed to the overall quality of our study.**

6. In the exit criteria, how were concentration problems identified? **Participants were excluded if they exhibited concentration difficulties due to high stress levels or medication use, which were identified through clinical evaluation and observation conducted by qualified professionals. This information has been added to the Materials and Methods section for further clarity and transparency. Thank you for**

your insightful comment, which has helped improve the description of the exclusion criteria.

7. Include additional information about how participants were recruited from the five learning disorder centers in Tehran. Mention any specific criteria or process used to select these centers and ensure that the sample is representative of the target population: **We have included additional information regarding the recruitment process of participants from the five learning disorder centers in Tehran. The selection of these centers was based on their recognized reputation and expertise in diagnosing and supporting students with Specific Learning Disorder (SLD), ensuring that our sample is indeed representative of the target population.**

8. In addition to mentioning the total number of participants and the gender distribution, consider providing more demographic details, such as the mean age and standard deviation of the participants, as well as any other relevant characteristics (e.g., grade level distribution). **Thank you for your feedback. This information was provided in results section.**
9. Clarify the scoring process for the PHAT. Mention whether the scoring was conducted in real-time during the testing sessions or later through video recordings. If there were any specific guidelines or rubrics for scoring the handwriting legibility and orthographic errors, include this information to ensure transparency: **Thank you for your comment. The reply to this comment has already been highlighted in blue in the reply to another reviewer.**

   Scoring Process: The scoring process for the PHAT was conducted in real-time during the testing sessions. An experienced occupational therapist, who administered the PHAT twice with a two-week time interval, scored the participants' handwriting legibility and orthographic errors. The examiner stood in front of the student and asked the student to read the words aloud and transcribe them on the bottom lines of the paper without using hyphens between words. In the dictation domain, the examiner dictated twelve words and asked the student to write them on lined paper without a time limitation.

   Inter-rater Reliability: To determine inter-rater reliability, scoring was conducted by two other occupational therapists with at least 5 years of experience in working with

students with SLD. Both examiners received scoring education and were in the same condition in terms of location and time during scoring.

We hope these clarifications provide a better understanding of the scoring process for the PHAT and address your concerns.

10. Emphasize the efforts taken to standardize testing conditions, including room lighting, ventilation, and other environmental factors. Additionally, if there were any specific instructions given to participants during the testing sessions, briefly mention them.

11. Authors should specify what words and standard text they used: **Thank you for your comment. The reply to this comment has already been highlighted in blue in the reply to another reviewer. An additional part has highlighted in yellow.**

12. In the statistical analysis section, provide the correct version number of the SPSS software used for data analysis: All analyses were conducted using SPSS version 27 software. It has highlighted in blue in response to another reviewer's comment.

Results:

13. it would be beneficial to provide a more detailed description of participant characteristics, such as the mean age, standard deviation, and the grade distribution within the sample. However, it would be beneficial to include the range of ages within the sample to provide a more comprehensive understanding of the age distribution: **Thank you for your feedback. We have updated the Results section to provide a more detailed description of participant characteristics, including the mean age (132.33 months) and standard deviation (53.8). Additionally, we have included the grade distribution within the sample, specifying the number of participants in each grade (fourth, fifth, and sixth). We have also included the range of ages within the sample to offer a more comprehensive understanding of the age distribution among the participants.**

These enhancements should provide a clearer picture of the demographic characteristics of our sample.

14. The small SEM and MDC values obtained for both the copying and dictation domains further support the reliability of the PHAT. Consider providing a brief explanation of what these values represent, i.e., the level of measurement error and the minimal detectable change in handwriting performance: **In response to the comment regarding SEM and MDC values, we have included a brief explanation of what these values represent.**

SEM reflects meaningful changes in a subject's score that go beyond measurement error, and we have specified that a SEM value of < ½ SD was used as a criterion. We have also highlighted the minimal detectable change in handwriting performance. The reporting type of these results has also become more regular and has been highlighted in yellow.

Discussion

15. it would be valuable to compare these results with previous studies that have investigated the reliability of other handwriting assessment tools in similar age groups. This will provide a broader context for understanding the reliability of the PHAT in comparison to existing tools: **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript.**

16. In the discussion section, consider elaborating on the clinical implications of the results. How does the good to excellent reliability of the PHAT impact its practical use in identifying handwriting difficulties in children with SLD? How might occupational therapists and educators utilize this tool effectively based on the demonstrated reliability? **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript. According to high reliability of PHAT, researcher and clinician can use this instrument in children with SLD aged 10-12 although the test developed with population who's aged 8-10. High reliability of the PHAT contribute to more accurate assessments and targeted interventions for children with SLD who experience handwriting difficulties at late childhood**.

17. While you mention that the inter-rater reliability of the PHAT was excellent, discuss how having raters with similar expertise and specialty may have contributed to the high inter-rater reliability. **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript. When each rater was an occupational therapist, the judgement criteria were close to each other and both of them received similar education for analysis of handwriting. For example, an occupational therapist analyses the handwriting in terms of visual perception and fine motor aspects but a teacher doesn't have this point of view: edited and highlighted. The main limitation of the present study is recruitment of participants during the COVID-19 pandemic. The pandemic led to online education and non-attendance of students in schools. Some**

participants didn’t come for retest and were excluded. Furthermore, the convenient sampling method was implemented and many of participants were excluded. As a result, the sampling process was extended. However, as participants studied in different schools it seems that the sample can represented the population and the results of study can generalize to children with SLD.

18. Regarding the limitation mentioned at the end of the results section, explain how the recruitment during the COVID-19 pandemic might have affected the study's results or implications. Were there any specific challenges or adaptations made during data collection due to the pandemic? **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript. The main limitation of the present study is recruitment of participants during the COVID-19 pandemic. The pandemic led to online education and non-attendance of students in schools. Some participants didn’t come for retest and were excluded. Furthermore, the convenient sampling method was implemented and many of participants were excluded. As a result, the sampling process was extended. However, as participants studied in different schools it seems that the sample can represented the population and the results of study can generalize to children with SLD.**

19. What are some areas that could be further explored in relation to handwriting assessment and interventions for students with SLD? **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript as suggestion future study. We suggest that future studies explore discriminant validity of the PHAT in TD children and children with SLD or other developmental disabilities and investigated the potential of the PHAT to be a screening tool for handwriting difficulties. Furthermore, we suggest that future studies investigated the construct validity of PHAT with fine motor and visual perception assessment tool as the most related area to handwriting**

20. Consider providing suggestions for future research directions. For example, you could propose investigating the validity of the PHAT by comparing its results with other established measures of handwriting or exploring its sensitivity in detecting changes in handwriting skills over time with intervention. **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript.**

It would be beneficial to briefly discuss the strengths of the PHAT, especially in comparison to other handwriting assessment tools. Highlight any unique features or advantages that the PHAT offers, which contribute to its excellent reliability in this specific population.

21. Discuss the potential impact of using the PHAT in educational settings. How could teachers or educators benefit from incorporating this tool into their assessments or interventions for students with SLD? Address the practical implications and feasibility of implementation in such settings. **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript.**

22. In the conclusion section, elaborate on the clinical significance of having a reliable tool like PHAT for occupational therapists working with children with SLD. Discuss how the availability of a validated assessment tool can lead to earlier identification and intervention for handwriting difficulties, potentially improving academic performance and overall well-being of these students. **We appreciate your valuable feedback and have taken it into careful consideration. It was highlighted in manuscript.**

2 Revision 1

2 comments · 17 Sep 2023 – 20 Sep 2023

Associate Editor

ACCEPT 17 Sep 2023

Dear Editor

I have reviewed the revised version of the manuscript. All of the reviewers' comments were considered by the authors.

Kind regards.

Editor-in-Chief

ACCEPT 20 Sep 2023

Dear Authors
We are pleased to inform you that your article is accepted for publication in the MEJRHS. We hope to receive other suitable articles from your group.