ADVANCED SCORING INSTRUCTIONS FOR THE MoCA

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MoCA SOLO

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BACKGROUND

- Reliable and accurate scoring is critical for performance-based assessments like the Montreal Cognitive Assessment (MoCA), as inconsistency between raters or imprecise measurement can lead to misclassification of test outcomes.
- In clinical practice, the MoCA is administered and scored by a single rater who uses standardised instructions that have been optimised to decrease scoring complexity and scoring time.
- We have developed a digital version of the MoCA, the MoCA Solo, which uses an avatar for administration and enables central, retrospective manual scoring of the MoCA.
- This is particularly interesting for large multi-centre clinical trials that typically include many different raters. For this purpose, more detailed scoring instructions have been developed. We explored the inter-rater reliability and measurement precision of the original and advanced scoring instructions for the MoCA.

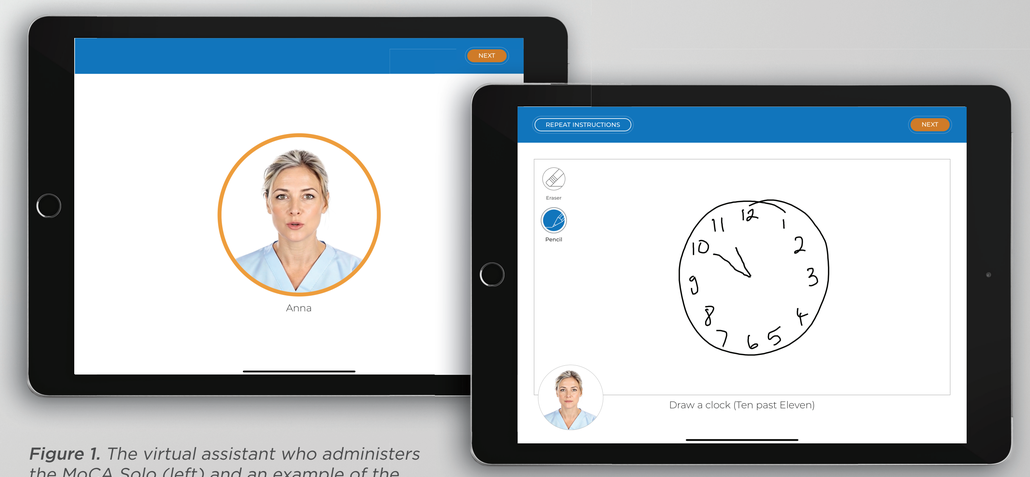

Figure 1. *The virtual assistant who administers the MoCA Solo (left) and an example of the clock drawing test in MoCA Solo (right).*

Advanced scoring instructions for the MoCA

The advanced scoring instructions were developed with clinical experts and based on a data-driven process. They provide more detail, remove ambiguity, and include methods to enhance the preciseness of scoring. In addition, the advanced scoring instructions provide examples of correct and incorrect answers, as previously suggested for the visuospatial/executive subtests by Cumming et al. (2018).

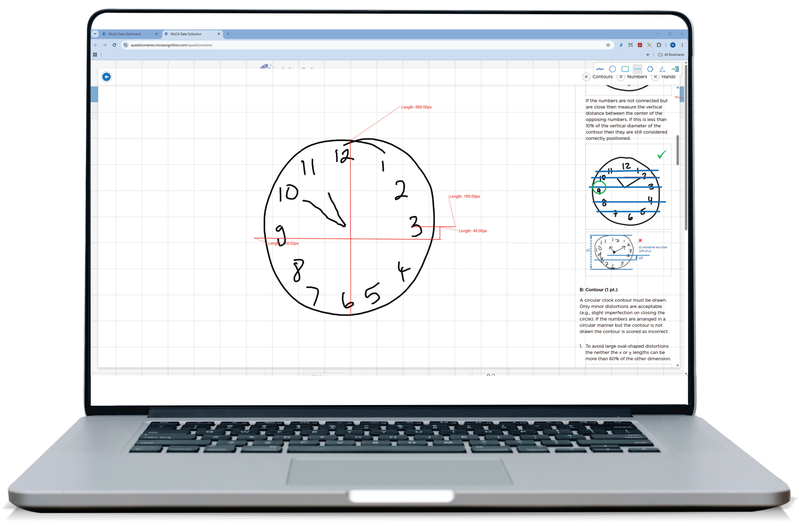

Figure 2. *Example of advanced scoring instructions for the clock drawing test.*

Comparing the original and advanced scoring instructions

To examine whether the advanced scoring instructions for the MoCA improve inter-rater reliability and measurement precision, N=104 MoCAs were independently scored manually after administration by three raters. Inter-rater reliability was calculated using intraclass correlation coefficients (ICC) and measurement precision was assessed through the minimum detectable change (MDC), which represents the smallest change in total MoCA score that can be interpreted as a true change beyond measurement error.

Results show excellent overall inter-rater reliability for the total MoCA score under the original (.91) and advanced scoring instructions (.96). Measurement precision improved from 2.2 points under the original scoring instructions to 1.5 points under the advanced scoring instructions, indicating improved measurement precision with the advanced scoring instructions.

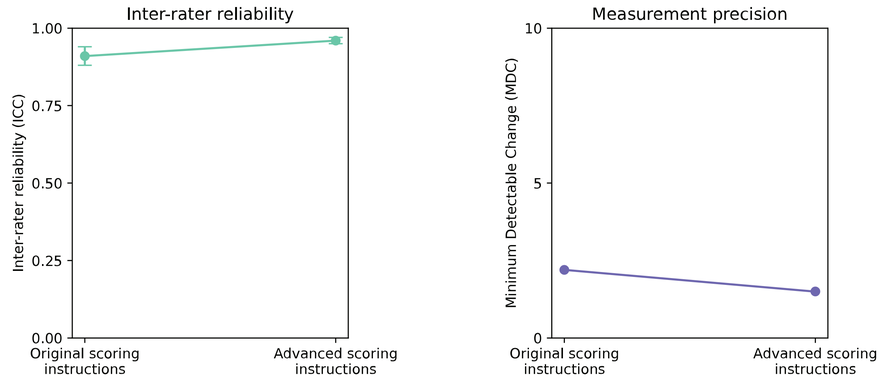

Figure 3. *ICC (left) and MDC (right) under the original and advanced scoring instructions.*

Rater qualification procedure

To ensure competence in using the advanced scoring instructions, we developed a rater qualification and certification procedure. This procedure entails the retrospective scoring of N=100 MoCAs. After scoring these MoCAs, the rater's scores are compared to a human rater consensus score for the same MoCAs derived from three independent raters who have been previously trained in using the advanced scoring instructions. New raters need to achieve agreement levels of ≥.8 for the Clock and Cube, and ≥.9 for all other subtests.

For the purpose of a clinical study, we have trained and tested 12 raters. Of these 12 raters, four qualified on their first attempt, an additional four qualified on their second attempt, and four have not qualified.

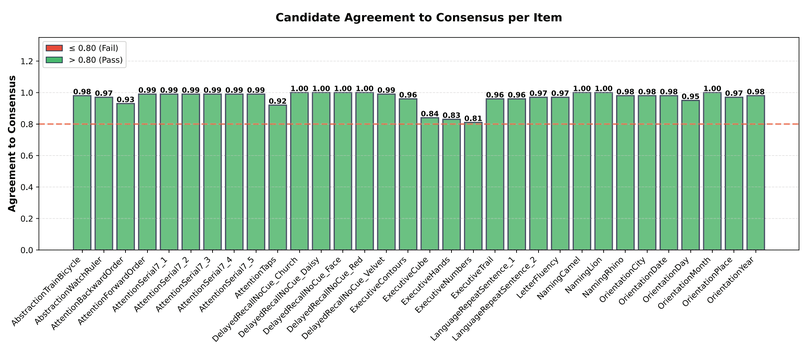

Figure 4. *Example of a passed rater qualification.*

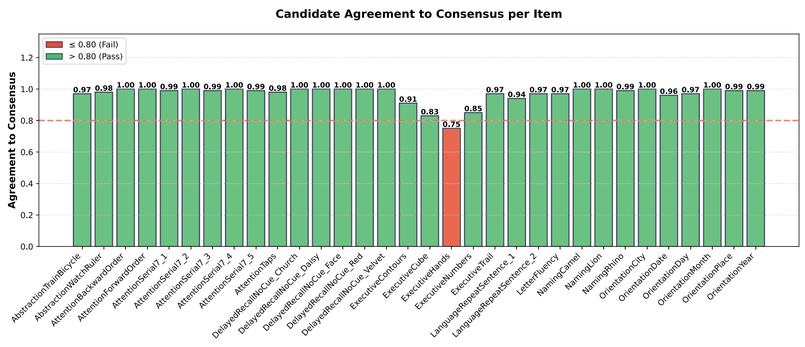

Figure 5. *Example of a failed rater qualification.*

We found that raters who spend more time on rating the MoCAs, have a higher agreement score (r=.56). Time spent on rating the MoCAs seems to reflect effort spent, resulting in a higher agreement with other raters.

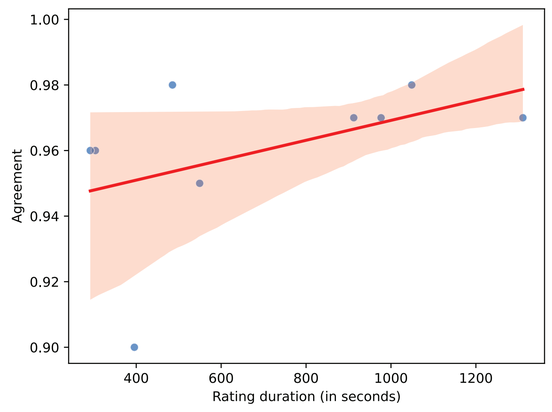

Figure 6. *Correlation between rating duration and agreement*

CONCLUSION

- Taken together, **these findings underscore the importance of clear, unambiguous scoring instructions for assessments** that are rated by human raters and highlight how more detailed scoring instructions can meaningfully improve both inter-rater reliability and measurement precision.
- We recommend that **in clinical practice, the original scoring instructions continue to be used** since they are less time-consuming and have excellent inter-rater reliability.
- In large multi-centre clinical trials, we recommend using the advanced scoring instructions **to ensure consistent and reliable assessment** across multiple raters.
- Raters using the advanced scoring instructions should receive training and complete a **qualification procedure** to demonstrate competence in using the advanced scoring instructions.

REFERENCES:

Cumming, T.B., Lowe, D., Linden, T., & Bernhardt, J. (2018). The AVERT MoCA Data: scoring reliability in a large multicenter trial. Assessment, 27(5), 976-981.