

# A Comparison of Cross-Cultural Regional Norms for the MATRICS Consensus Cognitive Battery (MCCB)

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## BACKGROUND

- The rise in international clinical trials that include cognitive, behavioral, and functional outcomes has increased interest in the psychometric characteristics of these measures in different languages and cultures.
- The MATRICS Consensus Cognitive Battery (MCCB) is widely used in international trials examining potential improvement in cognition in patients with schizophrenia (Nuechterlein et al., 2008).
- The MCCB consists of tests of speed of processing, attention/vigilance, working memory, verbal and visual learning, reasoning and problem solving, and social cognition. The standard outcome measure is an overall composite T-score which is standardized based on existing U.S. based norms.
- Normative MCCB data sets from regional cohorts in India, China, Russia, and Central and South America (CSA) have recently been developed.
- The potential benefit of using these regional normative corrections for MCCB composite scores is an open question.
- To address this, we examined differences between MCCB overall composite scores calculated using standard U.S. norms (Kern et al., 2008) and those calculated using regional normative data sets (language and region specific).

## METHODS

- MCCB composite scores were computed using both regional normative adjustments and standard U.S. based adjustments and results were compared.
- Baseline MCCB composite T-scores with normative adjustments from local, language-specific cohorts in India (Hindi: N=60 & N=28), China (Simplified Chinese: N=247), Russia (N=225), and Central and South America [CSA] (Colombia, Mexico, Chile, & Argentina: N=175) were examined.
- The difference in change score distributions was assessed when possible, based on data availability.

## RESULTS

- Results from China show a one standard deviation (SD) increase in mean MCCB composite T-scores relative to the application of U.S. norms (M = 31.2 vs. 21.4) [Figure 1].
- Results from Russia show a negligible increase in mean MCCB composite T-scores (1.3) relative to the application of U.S. norms (M = 26.5 vs. 25.2) [Figure 2].
- Results from CSA show a greater than two standard deviation (SD) increase in mean MCCB composite T-scores relative to the application of U.S. norms (M = 39.8 vs. 17.3) [Figure 3].
- Results from two samples in India using normative data collected in Hindi demonstrate a greater than two standard deviation (SD) increase in mean MCCB composite T-scores relative to the application of U.S. norms (M = 36.4 vs. 14.3 & M = 24.4 vs. -0.7) [Figures 4 & 6].
- The mean (+/- SD) changes in composite T-scores and effect sizes (Cohen's d) from baseline to week 24 were 7.3 (+/- 7.57; d = 1.0) using Hindi norms and 8.8 (+/- 8.60; d = 1.0) using U.S. norms [Figure 7].
- Figure 5 depicts the linear relationship between MCCB composite scores calculated with regional (international) and U.S.-based norms.
- Intraclass correlation coefficients of screening to baseline for both U.S. and regional norms were high ( $\geq 0.84$ ; range = 0.84 – 0.88).

### References:

- Nuechterlein, K. H. et al. (2008). The MATRICS Consensus Cognitive Battery, Part 1: Test selection, reliability, and validity. *American Journal of Psychiatry*, 165(2), 203-213.
- Kern, R. S. et al. (2008). The MATRICS Consensus Cognitive Battery, Part 2: Co-norming and standardization. *American Journal of Psychiatry*, 165(2), 214-220.
- Pedraza, O. & Mungas, D. (2008). Measurement in cross-cultural neuropsychology. *Neuropsychology Review*, 18(3), 184-193.

Figures 1, 2, 3, & 4: Comparison of Regional (in color) and U.S. Norms / Distributions for Schizophrenia Patients at Screening

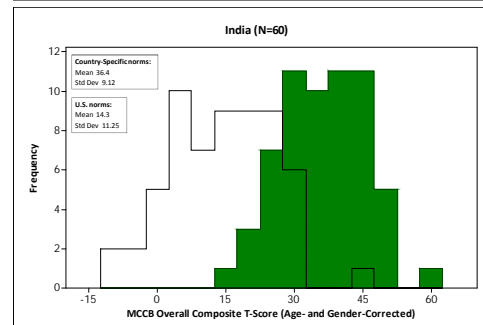
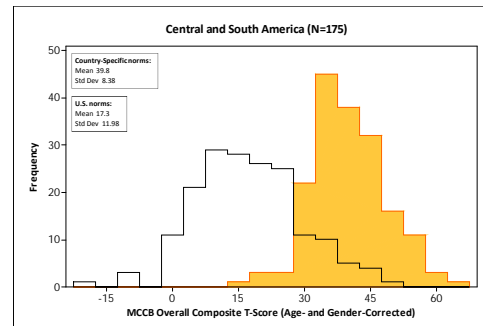
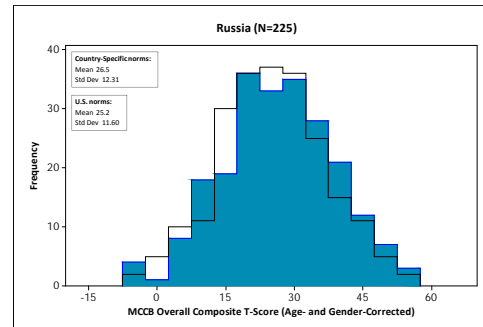
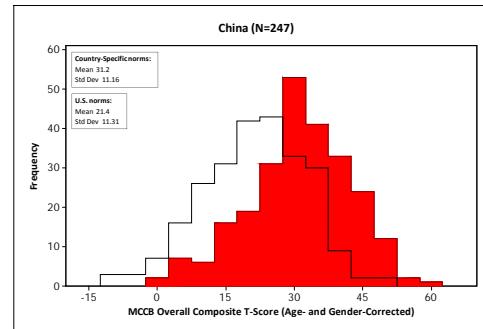
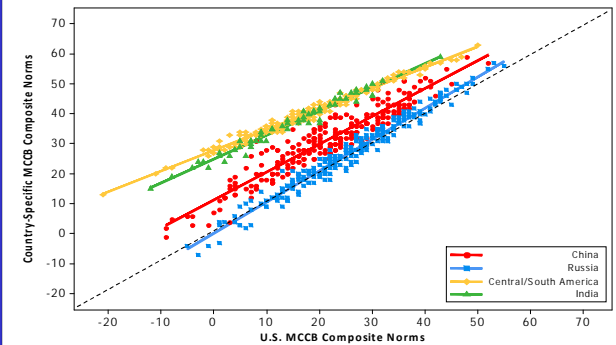
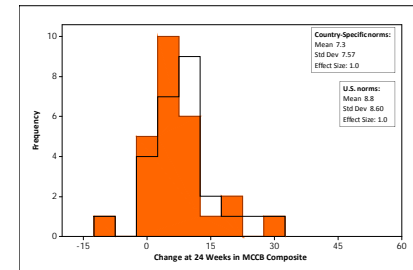
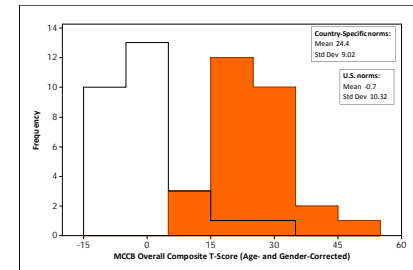


Figure 5: Region-Specific vs U.S. Based Norms



Figures 6 & 7: Comparison of Hindi and U.S. Based Norms For Baseline (N=28) and Change at 24 Weeks (N=26) For Active Treatment



## CONCLUSIONS

- Cross-cultural validity of measures is important to the success of international clinical trials with neurocognitive and behavioral endpoints.
- For measures such as the MCCB, which rely on normative correction, improving the applicability of norms to the population of interest has the potential to reduce noise due to cultural differences alone.
- Our results suggest that the choice of normative data sets may have a considerable impact on the baseline characterization and selection of subjects (depending on the region and language).
- The impact on change scores is less certain.
- Additional analyses on large data sets are necessary to determine the impact of local norms within each language and culture, and to assess the extent to which the use of regional norms may facilitate signal detection.

### Disclosures:

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