

Comparison of MoCA's Italian normative data in a cohort of healthy siblings of PD patients.

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Introduzione

MoCA is a rapid screening battery including subtests to assess frontal functions, abstraction and cognitive flexibility [1]. MoCA seems to be useful to identify non-amnesic mild cognitive impairment (MCI) and subcortical dementia typically present in parkinsonian patients. However, when applied to non-English or non-French speaking cohorts, these results are frequently disattended due to its highly strict cutoff [3]. Italian speaking subjects can count on two different normative sets without clear dominance of use. The objective of this study was to evaluate and compare available Italian validated adjustments [1-2] for Montreal Cognitive Assessment (MoCA) in an established study cohort, in relation to international validation by Nasreddine [3].

Metodi

100 Italian siblings of PD patients, part of an established cohort on PD biomarkers, underwent a brief cognitive evaluation by means of MoCA. International and Italian validations were applied and compared by means of linear and logistic regression.

Risultati

Siblings (44% males) presented with a mean age of 63.64 ± 9.64 years and a mean education of 11.12 ± 4.09 years. Using the international adjustment, siblings obtained a mean MoCA score of 25.39 ± 2.98 points, 44 scored below the cutoff value.

Following Conti's adjustment, MoCA mean score was 22.82 ± 2.91 and 4 subjects presented pathological equivalent score, with Santangelo's adjustment the mean score was 24.46 ± 2.93 and only one sibling showed a pathological performance.

A strong linear correlation was found between Conti's and Santangelo's adjustments (R^2 0.805, β coeff. 0.889, CI 0.802-0.977, $p < 0.001$), with a significant mean difference of -1.65 ± 1.32 between the scores ($p < 0.001$); similar results were obtained for each subtest.

Correlation with Nasreddine's was still present, but weaker (with Conti: R^2 0.484, β coeff. 0.707, CI 0.561-0.977, $p < 0.853$; with Santangelo R^2 0.425, β coeff. 0.669, CI 0.513-0.824, $p < 0.001$).

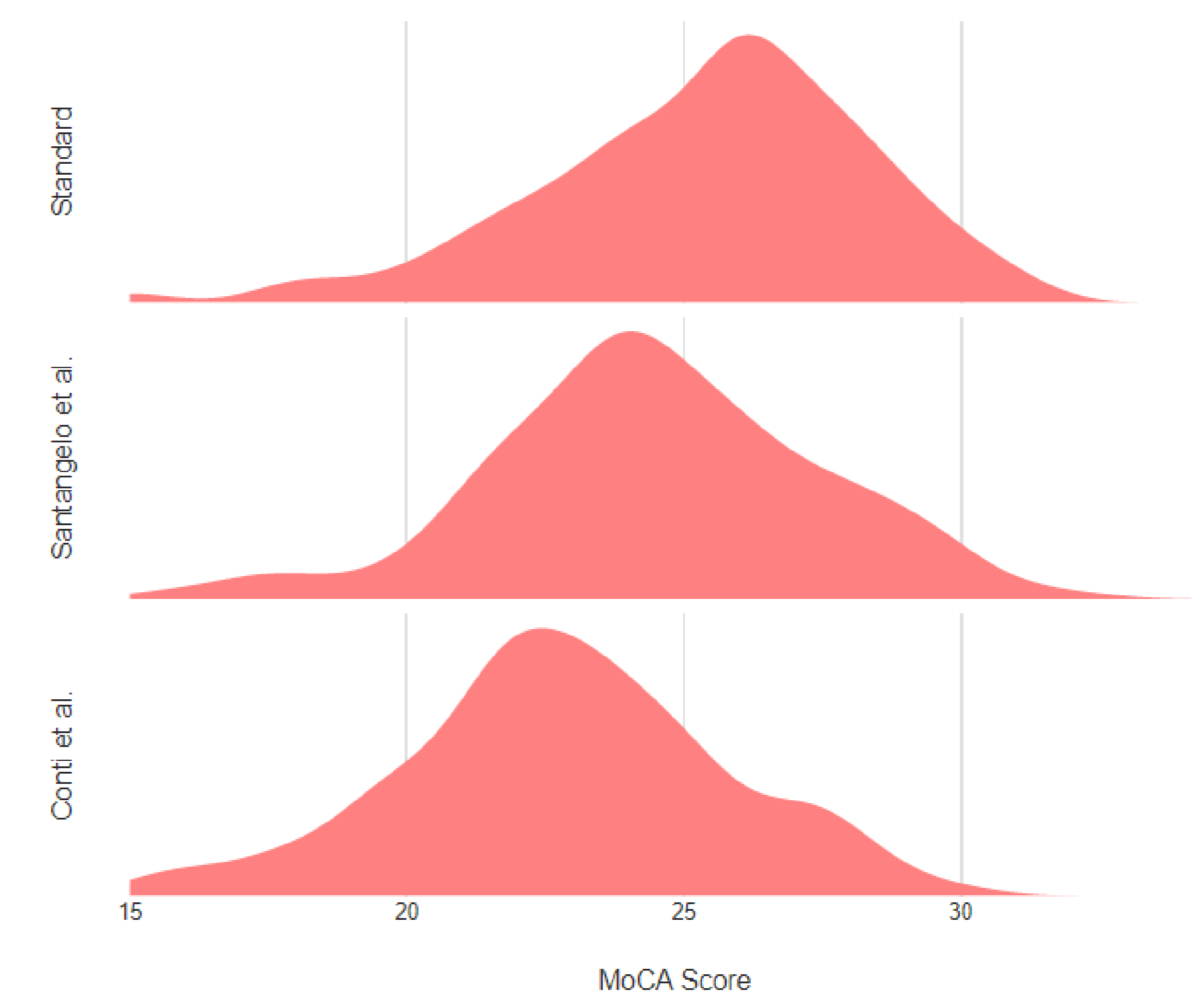
Conclusioni

Available Italian validations of MoCA do not show differences in evaluating otherwise healthy subjects. In our cohort Conti worked slightly better in discriminating performances below the 95th percentile of the norm, although Santangelo's score was more similar to the international adjustment. Internationally used cutoff confirms to be too much restrictive in Italian-speaking cohorts.

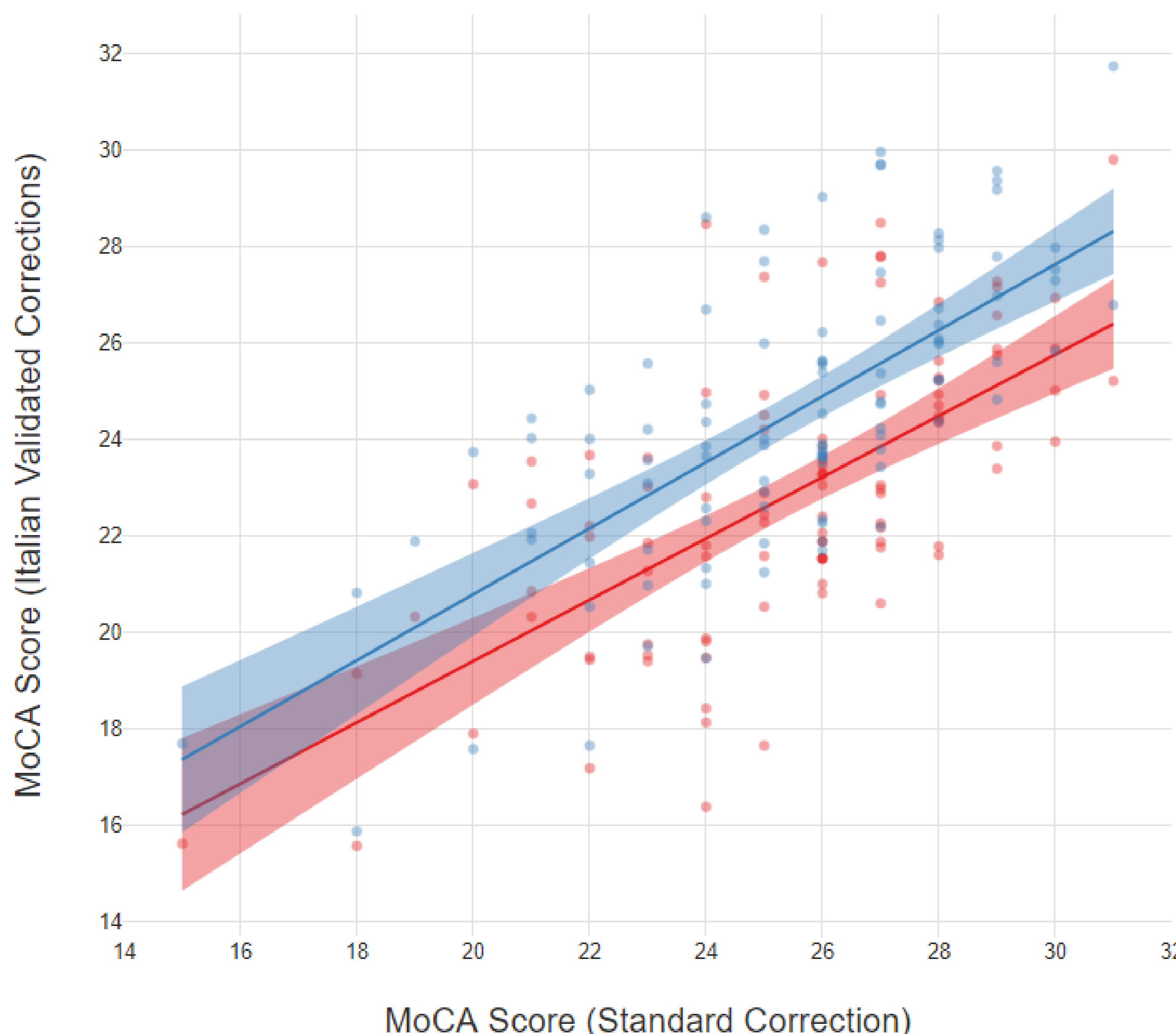
↓ **Table 1.** General and Cognitive features of PD Siblings.

	PD Siblings
	<i>n</i> =100
Age (mean ± SD)	63.64 ± 9.64
Males (%)	44 (44%)
Education (mean ± SD)	11.12 ± 4.09
General Cognition	
Raw MoCA Score (mean ± SD)	24,00 ± 2,37
MoCAc Score - Standard (mean ± SD)	25.39 ± 2.38
Abnormal MoCA - Standard (%)	44 (44.0%)
MoCAc Score - Conti et al. (mean ± SD)	22.82 ± 2.91
Abnormal MoCA - Conti et al. (%)	4 (4.0%)
MoCAc Score - Santangelo et al. (mean ± SD)	24.47 ± 2.93
Abnormal MoCA - Santangelo et al. (%)	1 (1.0%)
Cognitive Areas	
- Visuospatial-executive (mean ± SD)	4.34 ± 0.97
- Language (mean ± SD)	4.93 ± 1.08
- Attention, Concentration, Working Memory (mean ± SD)	5.59 ± 0.67
- Abstraction (mean ± SD)	1.48 ± 0.64
- Short-term Memory (mean ± SD)	2.23 ± 1.53
- Orientation (mean ± SD)	5.88 ± 0.33

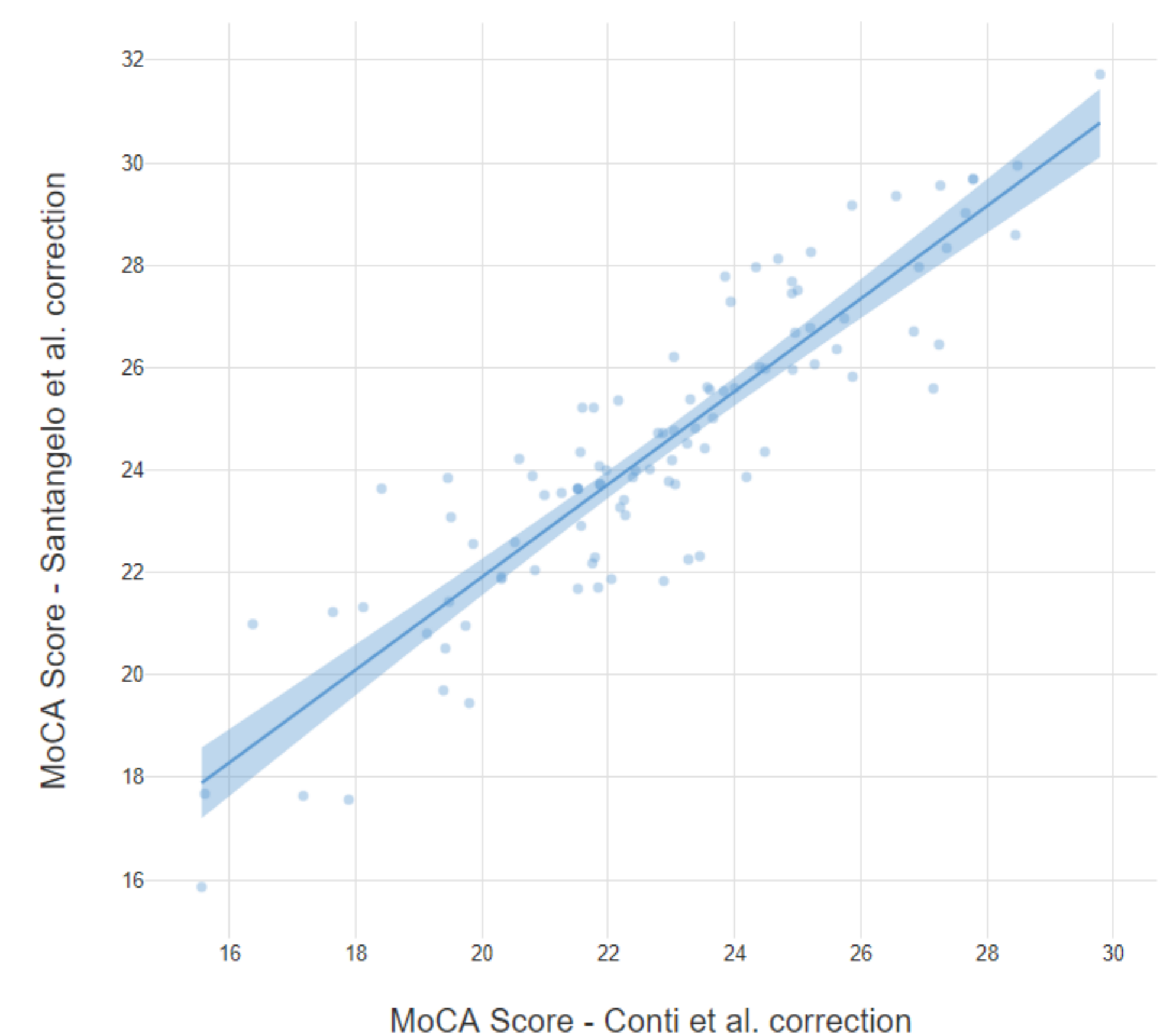
↓ **Figure 1.** Density distribution of MoCA scores with different corrections applied.



↓ **Figure 2.** Linear regression of MoCA score corrected using standard correction vs. Italian validated corrections (Santangelo et al. in blue, Conti et al. in red).



↓ **Figure 3.** Linear regression of MoCA score corrected using Conti Italian validated correction vs. Santangelo validated correction.



Bibliografia

1. Kalia LV, Lang AE. Parkinson's disease. Lancet 2015;386(9996):896-912.
2. Berg D, Postuma RB, Adler CH, et al. MDS research criteria for prodromal Parkinson's disease. Mov Disord 2015;30(12):1600-1611.
3. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005 Apr;53(4):695-9.