

A systematic review and meta-analysis on cognitive and behavioral impairments in primary tauopathies

Castano, Federico^{a,b,c}, Rodrigues, Farley, MD^d, Manes, Facundo, PhD, MD^{a,c}, Roca, Maria, PhD^{a,c}, Di Luca, Daniel, PhD MD^f, Couto, Blas, PhD, MD^{a,c,e}

^a Institute of Cognitive and Translational Neuroscience (INCYT) Favaloro-INECO-CONICET, Buenos Aires, Argentina; ^b Pontifical Catholic University of Argentina “Santa María de los Buenos Aires”, Buenos Aires, Argentina; ^c Institute of Cognitive Neurology (INECO), Buenos Aires, Argentina; ^d Federal University of Viçosa (UFV), Viçosa, Brazil; ^e Movement Disorders Unit, Institute of Neuroscience, Favaloro Foundation, Buenos Aires, Argentina; ^f Department of Neurology, Washington University in St. Louis, MO-USA

Across 169 studies, cognitive assessment in PSP and CBS relies predominantly on global screening measures. Within-study comparisons consistently showed worse global cognitive performance in PSP than in CBS.

INTRODUCTION

Progressive supranuclear palsy (PSP) and corticobasal syndrome (CBS) are primary tauopathies with overlapping motor, cognitive, and behavioral manifestations. However, the instruments used to assess cognition, behavior, and clinical severity vary widely across studies, limiting quantitative synthesis and direct comparison between diagnostic groups.

Objective: To systematically review and meta-analyze cognitive, behavioral, and clinical severity measures in PSP and CBS.

METHODS

PRISMA-based systematic review and meta-analysis. Searches were performed in PubMed/MEDLINE, EMBASE, PsycINFO, Scopus, LILACS, and Google Scholar. Study selection and data extraction focused on cognitive, behavioral, and clinical severity outcomes in PSP and CBS. Random-effects meta-analyses were conducted for eligible outcomes, and within-study comparative meta-analyses were performed using Hedges’ g to quantify PSP–CBS differences.

RESULTS

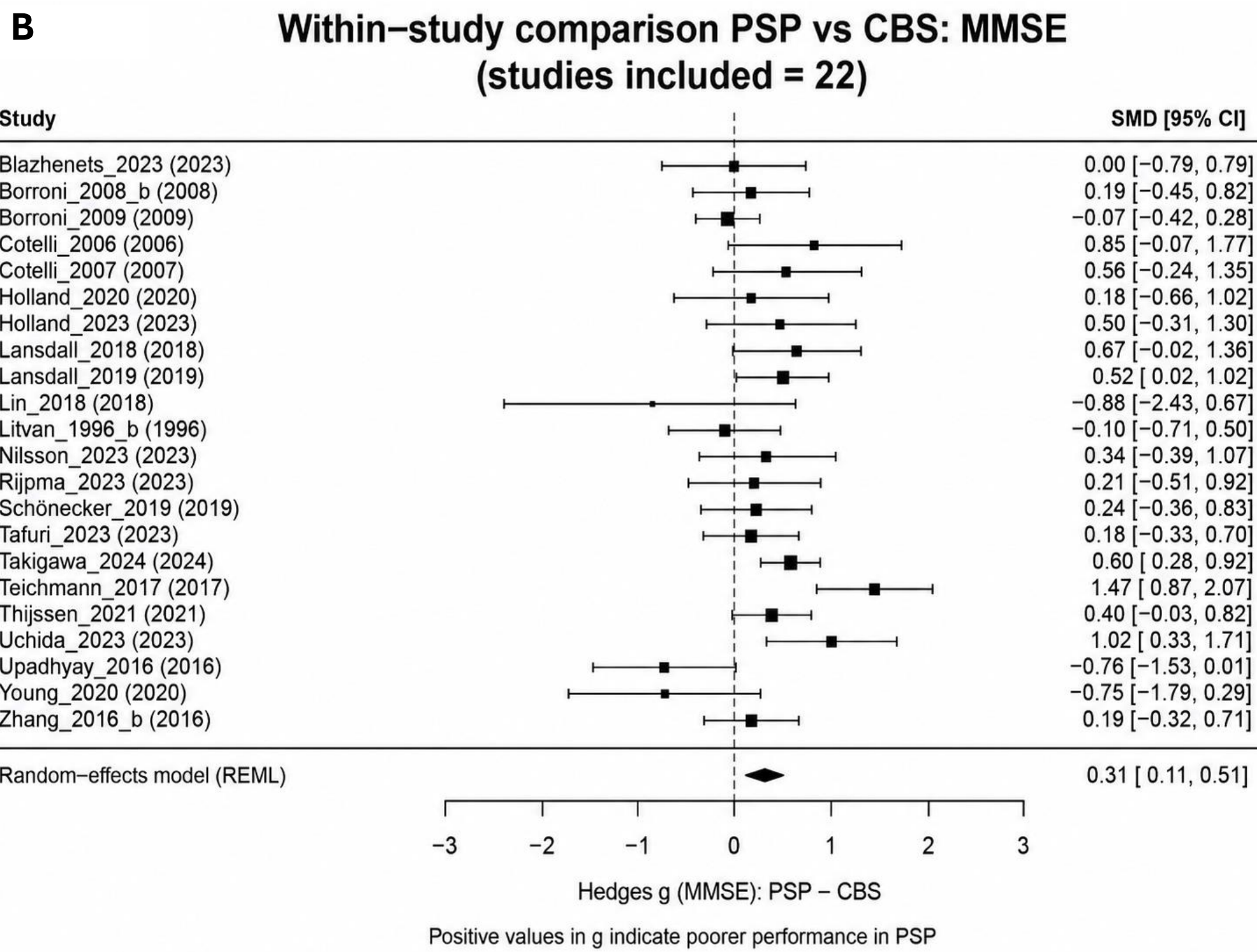
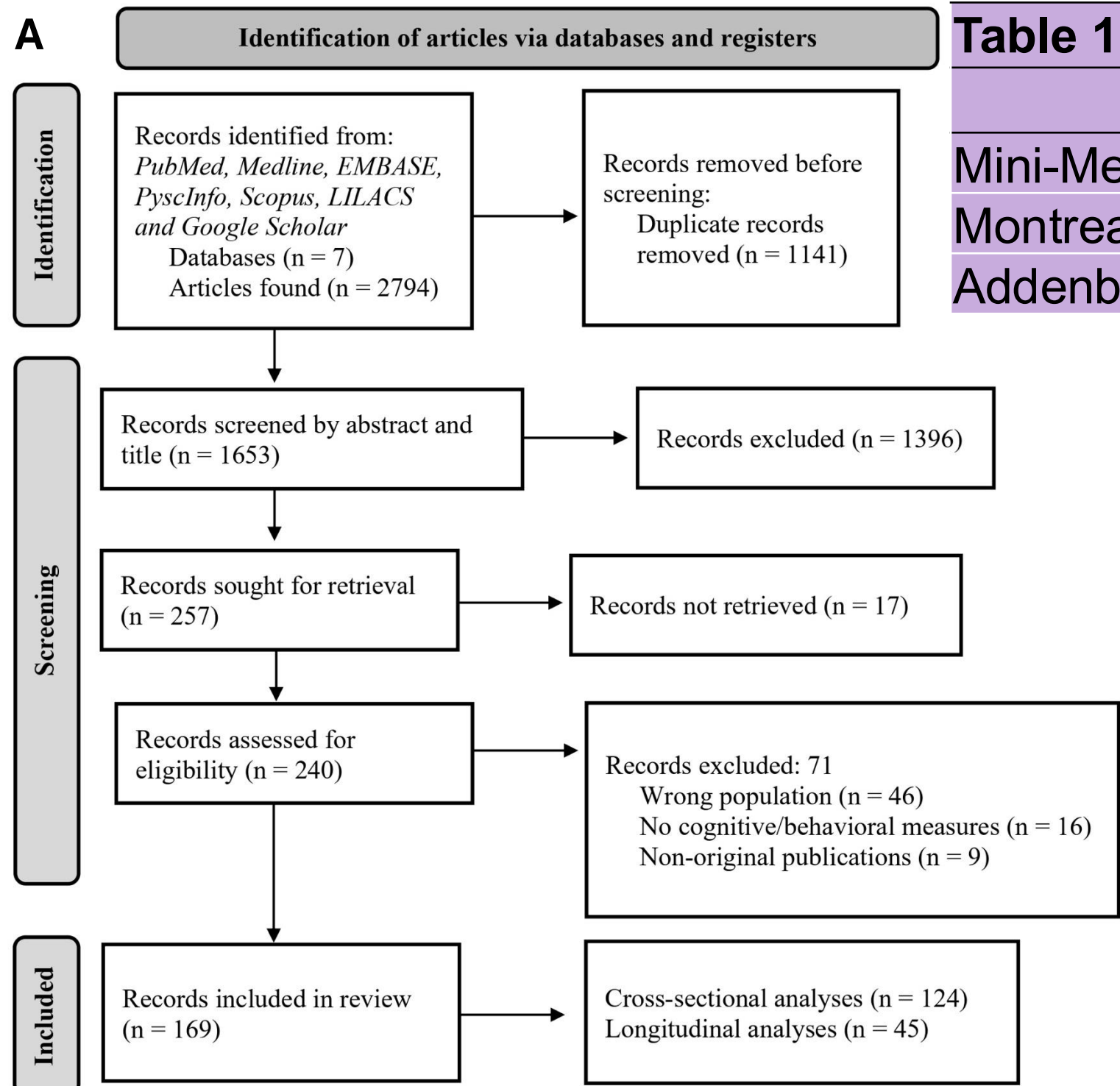


Table 1. Within-study comparative meta-analysis of cognitive screening measures

Neuropsychological tests	PSP vs CBS
Mini-Mental State Examination (MMSE)	PSP performed worse than CBS
Montreal Cognitive Assessment (MoCA)	
Addenbrooke’s Cognitive Examination (ACE)	

C Cognitive and behavioral instruments by study design

Cognitive tests — Wisconsin Card Sorting Test (WCST)	n=5, 4.03%	n=1, 2.22%
Cognitive tests — Visual Object and Space Perception Battery (VOSP)	n=2, 1.61%	n=2, 4.44%
Cognitive tests — Verbal fluency (not specified) (VF-NS)	n=1, 0.81%	n=2, 4.44%
Cognitive tests — Trail Making Test (A and/or B) (TMT)	n=14, 11.30%	n=8, 17.80%
Cognitive tests — Taylor Figure Copy (Taylor)	n=1, 0.81%	
Cognitive tests — Stroop Test (Stroop)	n=6, 4.84%	
Cognitive tests — Similarities (Similarities)	n=1, 0.81%	n=2, 4.44%
Cognitive tests — Semantic verbal fluency (SVF)	n=18, 14.50%	n=5, 11.10%
Cognitive tests — Rey Auditory Verbal Learning Test (RAVLT)	n=13, 10.50%	
Cognitive tests — Rey–Osterrieth Complex Figure (ROCF)	n=10, 8.06%	n=1, 2.22%
Cognitive tests — Raven’s Progressive Matrices (RCPM)	n=4, 3.23%	n=3, 6.67%
Cognitive tests — Phonemic verbal fluency (PVF)	n=23, 18.50%	n=11, 24.40%
Cognitive tests — Nelson test (Nelson)		n=2, 4.44%
Cognitive tests — Mini-SEA (Mini-SEA)	n=1, 0.81%	
Cognitive tests — Memory Battery (MB)	n=5, 4.03%	n=1, 2.22%
Cognitive tests — Logical Memory (LM)	n=5, 4.03%	n=3, 6.67%
Cognitive tests — Hayling Test (Hayling)	n=4, 3.23%	n=2, 4.44%
Cognitive tests — Go/No-Go (GNG)	n=2, 1.61%	n=1, 2.22%
Cognitive tests — Faux Pas Test (Faux Pas)	n=1, 0.81%	
Cognitive tests — Digit Span Forward (DS-F)	n=18, 14.50%	n=2, 4.44%
Cognitive tests — Digit Span Backward (DS-B)	n=16, 12.90%	n=2, 4.44%
Cognitive tests — Corsi Block-Tapping Test (Corsi)	n=1, 0.81%	
Cognitive tests — Clock Drawing Test (Clock)	n=5, 4.03%	n=1, 2.22%
Cognitive tests — Boston Naming Test (BNT)	n=8, 6.45%	
Cognitive tests — Benton Figure (Benton)	n=3, 2.42%	n=2, 4.44%
Cognitive tests — Analogies (Analogies)		n=2, 4.44%
Cognitive tests — A Quick Test for Cognitive Speed (AQTS)	n=1, 0.81%	
Behavioral / neuropsychiatric — Non-Motor Symptoms Scale (NMSS)	n=3, 2.42%	
Behavioral / neuropsychiatric — Neuropsychiatric Inventory (NPI)	n=18, 14.50%	n=5, 11.10%
Behavioral / neuropsychiatric — Hamilton Depression Rating Scale (HDRS)	n=13, 10.50%	n=3, 6.67%
Behavioral / neuropsychiatric — Hamilton Anxiety Rating Scale (HAM-A)	n=10, 8.06%	n=2, 4.44%
Behavioral / neuropsychiatric — Geriatric Depression Scale (GDS)	n=10, 8.06%	n=4, 8.89%
Behavioral / neuropsychiatric — Frontal Behavioral Inventory (FBI)	n=7, 5.65%	n=2, 4.44%
Behavioral / neuropsychiatric — Frontal Assessment Battery (FAB)	n=33, 26.60%	n=11, 24.40%
Behavioral / neuropsychiatric — Cambridge Behavioural Inventory (CBI)	n=7, 5.65%	
Behavioral / neuropsychiatric — Beck Depression Inventory (BDI)	n=15, 12.10%	n=3, 6.67%
Behavioral / neuropsychiatric — Barratt Impulsivity Scale (BIS)	n=1, 0.81%	
Behavioral / neuropsychiatric — Apathy Evaluation Scale (AES)	n=10, 8.06%	n=3, 6.67%
Cross-sectional		Longitudinal

- MMSE, MoCA, and ACE are the most frequently used measures in PSP and CBS.
- PSP shows worse global cognitive performance than CBS.
- Standardized neuropsychological assessment remains a major unmet need.
- Domain-specific cognitive measures are underrepresented, especially in longitudinal studies.
- Within-study comparisons reduce heterogeneity and better capture PSP–CBS differences.

CONTACT



fcastano@ineco.ar

www.fundacionineco.org
www.fundacionfavaloro.org
<https://incyt.conicet.gov.ar/laboratorios%20actualizado>