

Characterizing Exceptional Gait Speed in Late Life: The Super Mover Phenotype Among Adults 80+ in Colombia

Isabella Bonilla-Arbeláez¹, Daniel Vasquez¹, Alejandro Guerrero¹, Elkin Garcia-Cifuentes^{1,2}, Eugenia Hurtado¹, Jonathan Ruiz-Triviño¹, María José Hidalgo¹, Diana Alzate¹, Yamile Bocanegra¹, Claudia Muñoz¹, Claudia Aponte¹, Juan Camilo Becerra¹, Liliana Hincapie¹, Joseph F. Arboleda-Velasquez³, Yakeel T Quiroz^{4,5}, David Aguillón¹

1.Grupo de Neurociencias de Antioquia, Facultad de Medicina, Universidad de Antioquia, Medellín, Colombia; 2.University of Toronto, Toronto, Canada; 3.Schepens Eye Research Institute of Mass Eye and Ear and Department of Ophthalmology, Harvard Medical School, Boston, USA; 4.Department of Psychiatry, Massachusetts General Hospital, Boston, Massachusetts, USA; Boston University, Boston, Massachusetts, USA.

Introduction //

Healthy aging involves preservation of physical and cognitive function, with gait speed (GS) serving as a marker of neurocognitive complexity¹. Motoric cognitive risk syndrome identifies slow gait as an early marker of cognitive decline². The potential for fast gait speed as a marker of resilience remains underexplored. The **Super Mover (SM)** phenotype is a novel term described for the first time in 2025, defined as individuals aged 80 and older with GS of ≥ 1.5 standard deviations above sex-adjusted cut scores³.

Objective //

To identify and characterize the SM phenotype in a Colombian sample, comparing their sociodemographic profile and cognitive performance with **Normal Movers (NM)**. To examine whether there is a relationship between exceptional physical performance and better cognitive function.

Methods //

A cross-sectional, observational study was conducted with 50 participants from the Grupo de Neurociencias de Antioquia. Inclusion criteria were: age ≥ 80 years and availability of motor and neuropsychological assessments. They were classified as SM if their GS exceeded 1.5 SD above age - and sex - specific colombian means. Cut-offs were set at GS ≥ 0.805 m/s for women and ≥ 0.975 m/s for men; participants below these were classified as NM. Assessment included handgrip strength, functional independence, and a comprehensive neuropsychological battery. Analyses were performed using R.

Conclusions //

These findings characterize a high-functioning phenotype within a Colombian sample, in which the SM profile is associated with greater physical strength and enhanced performance in verbal fluency and memory recognition, domains linked to frontal lobe function, which also underpins motor processes. This convergence suggests that motor efficiency may reflect a more preserved neurocognitive state and could serve as a proxy indicator of successful aging. Future studies should further elucidate the underlying biological mechanisms that preserve this motor-cognitive resilience.

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Results //

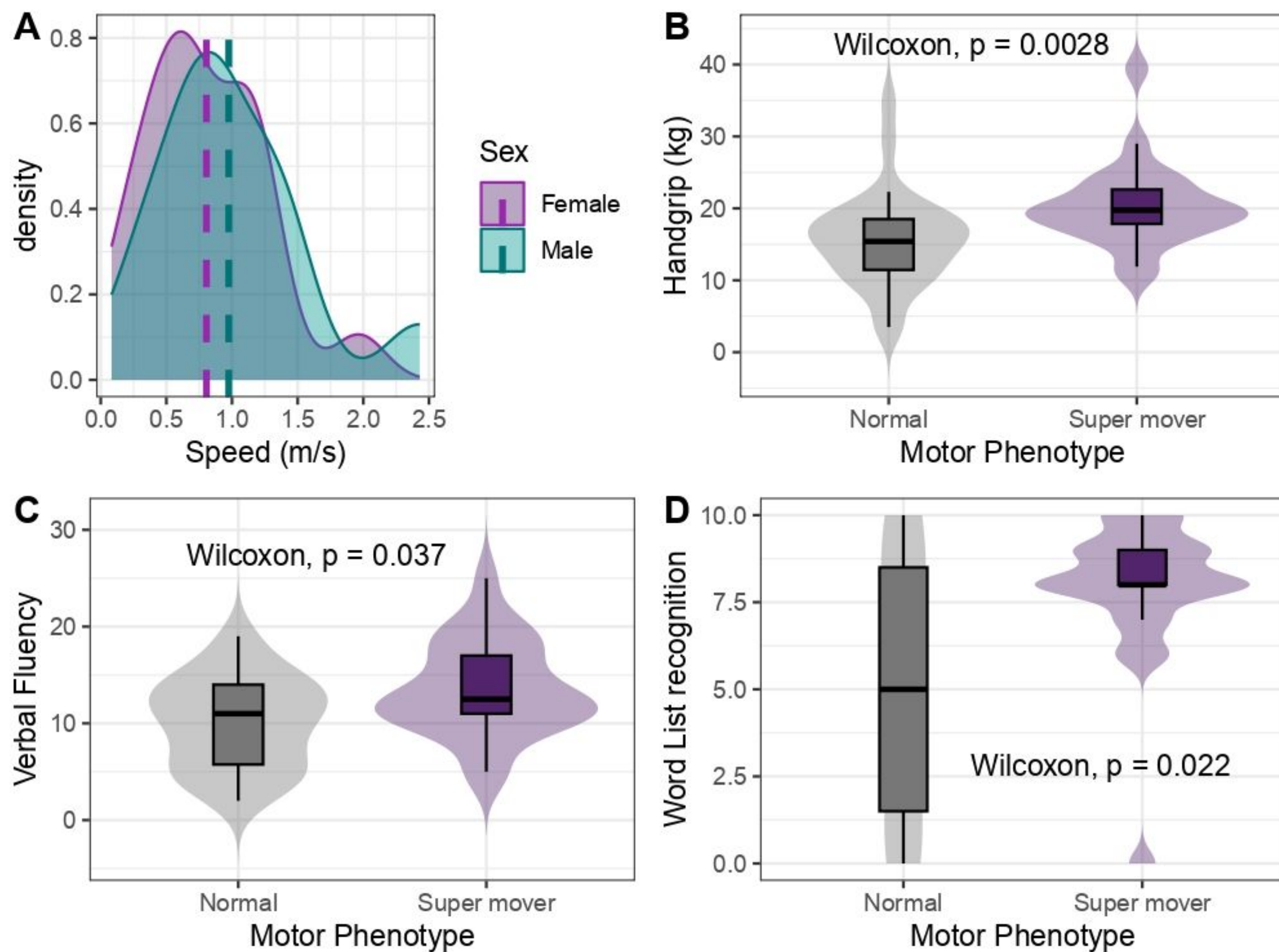
Table 1. Sociodemographic Characteristics and Functional Assessment of Super Movers vs. Normal Movers

Variable	Super Mover (n=22)	Normal Mover (n=28)	p-value
Sex			0.9
Female, n (%)	17 (77%)	21 (75%)	
Male, n (%)	5 (23%)	7 (25%)	
Age at visit (years), median [Q1, Q3]	86.7 [85.2, 91.1]	92.7 [90.0, 98.9]	0.004
Education (years), median [Q1, Q3]	3.0 [2.0, 5.0]	7.0 [5.0, 9.5]	0.011
Lawton IADL Scale, n (%)			0.056
Independent/Mild Dep.	20 (91%)	17 (63%)	
Moderate/Severe Dep.	2 (9.1%)	5 (19%)	
Total Dependence	0 (0%)	5 (19%)	
Functional Assessment Staging (FAST), n (%)			0.2
No Dementia	14 (67%)	13 (46%)	
MCI	4 (19%)	4 (14%)	
Dementia	3 (14%)	11 (39%)	
MMSE, median [Q1, Q3]	24.0 [22.0, 26.0]	25.0 [17.8, 27.0]	>0.900

1. Sociodemographic Profiles: Of the 50 participants, 22 (44%) met the criteria for the SM phenotype (Figure 1A). Individuals in the SM group were younger than those in the NM group, and had fewer years of formal education (Table 1).

2. Physical and Functional Assessment: SM group demonstrated markedly greater muscle strength (Figure 1B). Lawton IADL scale revealed a trend toward higher instrumental independence in the SM group. FAST scale didn't show any statistically significant differences (Table 1).

Figure 1. Physical and Cognitive Performance of Super Mover vs. Normal Mover



3. Cognitive Performance: SM performed significantly better on semantic verbal fluency tasks (Figure 1C), and showed superior performance in the CERAD word list recognition task (Figure 1D).

4. Affective and Anxiety Screening and Pharmacological Burden
Regarding mental health and pharmacological burden, no statistically significant differences were observed between SM and NM groups. Furthermore, the pharmacological burden did not differ between SM and NM.

Contact //

Name: David Aguillón
Email: david.aguillon@gna.org.co

