

UNDERSTANDING PROSPECTIVE MEMORY IN MULTIPLE SCLEROSIS: HOW ARE OBJECTIVE AND SUBJECTIVE MEASURES RELATED AND WHO EXPERIENCES PROBLEMS

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Background

- Persons with multiple sclerosis (PwMS) can experience deficits in prospective memory (PM) or “remembering to remember,” which are associated with functional difficulties.
- However, little is known in this population about the relationship between objective and subjective measures of PM or who is more likely to experience PM impairments.

Objectives

- Examine the association between objective and subjective measures of PM
- Explore which demographics and MS-related characteristics are related to objective and subjective PM performance.

Methods

Participants:

- PwMS (n = 112) from a larger study¹ who completed a neuropsychological battery.

Measures:

- Demographics:** Age, education, gender, race, and ethnicity
- MS-related characteristics:** disease duration, MS type, and level of disability (Patient Determined Disease Steps; PDDS)²⁻⁴
- Objective PM:** Memory for Intentions Test (MIST)⁵
 - Raw total score used
- Subjective PM:** Perceived Deficits Questionnaire PM subscale (PDQ-PM)⁶
- Depressive Symptom Severity:** Hospital Anxiety and Depression Scale (HADS-D)⁷

Statistical Analyses:

- Aim 1:** Spearman’s correlation between the MIST and PDQ-PM, followed by a partial correlation controlling for HADS-D.
- Aim 2:** Separate stepwise linear regressions for the MIST and PDQ-PM with the selected demographics and MS-related characteristics.

Results

- MIST Total Score and PDQ-PM were significantly, albeit weakly, associated with each other ($\rho = -.24$, $p = .012$).
 - After controlling for the HADS-D, the relationship remained significant ($\rho = -.21$, $p = .030$).

Results (Cont.)

		B (SE)	95% CI	β	p-value
Step 1	Constant	34.64 (0.97)			
	Race (Black)	-10.14 (3.25)	-16.57, -3.71	-0.29	.002
Step 2	Constant	37.82 (1.47)			
	Race (Black)	-9.92 (3.15)	-16.15, -3.68	-0.28	.002
	PDDS	-1.22 (0.43)	-2.07, -0.36	-0.25	.006
Step 3	Constant	38.69 (1.49)			
	Race (Black)	-10.24 (3.09)	-16.37, -4.10	-0.29	.001
	PDDS	-1.09 (0.43)	-1.93, -0.24	-0.22	.012
	Gender (Men)	-4.58 (2.03)	-8.61, -0.57	-0.20	.026

Table 1: Stepwise linear regression for the MIST Total Score

		B (SE)	95% CI	β	p-value
Step 3	Constant	42.17 (6.92)			
	Age	-0.18 (0.07)	-0.33, -0.03	-0.21	.019
	Years of education	0.20 (0.40)	-0.59, 0.99	0.05	.616
	Race (Black)	-11.66 (3.16)	-17.93, -5.40	-0.33	<.001
	Gender (Men)	-5.20 (2.06)	-9.27, -1.12	-0.23	.013

Table 2: Final step of revised MIST Total Score regression, with age and education entered into Step 1 and remaining variables entered in forward stepwise entry

		B (SE)	95% CI	β	p-value
Step 1	Constant	7.41 (0.31)			
	Race (Black)	4.79 (1.05)	2.71, 6.86	0.40	<.001
Step 2	Constant	10.82 (1.29)			
	Race (Black)	4.32 (1.03)	2.28, 6.37	0.36	<.001
	Age	-0.07 (0.02)	-0.11, -0.02	-0.24	.007

Table 3: Stepwise linear regression for the PDQ-PM

		B (SE)	95% CI	β	p-value
Step 2	Constant	12.93 (2.20)			
	Age	-0.06 (0.02)	-0.11, -0.14	-0.22	.012
	Years of education	-0.15 (0.13)	-0.40, 0.10	-0.10	.243
	Race (Black)	4.30 (1.03)	2.26, 6.34	0.36	<.001

Table 4: Final step of revised PDQ-PM regression, with age and education entered into Step 1 and remaining variables entered in forward stepwise entry

Results (Cont.)

- Black PwMS, men, and PwMS with higher PDDS scores had lower performances on the MIST (**Table 1**).
 - Even when age and education were entered into the first step, Black PwMS continued to have poorer performance (lower scores) on the MIST, as did men (**Table 2**).
- Black PwMS and younger PwMS reported more PM problems with the PDQ-PM (**Table 3**).
 - Even when age and education were entered into the first step, Black PwMS continued to have higher PDQ-PM score (**Table 4**).

Conclusions

- Even after factoring in for depressive symptom severity, which can influence perceptions of cognitive functioning, objective and subjective measures of PM are associated with each other in MS.
- Men demonstrated worse PM performance, which is consistent with other findings that men with MS can present with more cognitive impairment than women⁸.
- While the findings suggest that Black PwMS experience higher rates of PM issues, on both objective and subjective measures, further investigation is needed to determine the specific contributing factors.

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