

Background

Errors on cognitive tests can provide important insights into patients’ difficulties and support both primary and differential diagnoses. However, errors can be misinterpreted as signs of impairment when base rates are not established in test-naïve, clinically normal populations.

We investigated the frequency and demographic predictors of neuropsychological test errors in community dwelling clinically normal older adults in Ethiopia.

Methods

The sample consisted of 166 clinically normal older adults (age = 62.0±8.5 years; 47.6% female; education = 8.5±5.0 years; 53.0% monolingual). Participants were enrolled from the community using purposive sampling as a part of a larger ongoing study (UG3AG090679).

Cognitive tests were culturally adapted CERAD Word List Memory Test and the National Alzheimer’s Coordinating Center’s Uniform Data Set Animal and Vegetable Fluency.

We examined repetition, intrusion/rule violation, and validity errors using frequency distributions and multiple linear regressions.

Results

Repetition and intrusion errors were highly prevalent across most tasks (Table 1). Female sex was significantly associated with higher number of repetition errors on Animal Fluency (B = 0.319, P = 0.049). Higher age was associated with fewer inclusion errors on Delayed Recall (B = -0.014, P = 0.032). Multilingualism (binary) was associated with fewer intrusions on Vegetable Fluency (B = -0.238, P = 0.013).

Results (cont.)

Table 1. Frequency of errors by type and test (N = 166).

	Score Range	Validity Errors	Repetition Errors	Intrusion Errors
Word List Immediate Recall	0-30	0/ 166	78/ 166	65/ 166
Word List Delayed Recall	0-10	0/166	43/166	60/166
Animal Fluency	0+	0/166	62/166	4/166
Vegetable Fluency	0+	0/166	42/166	45/166

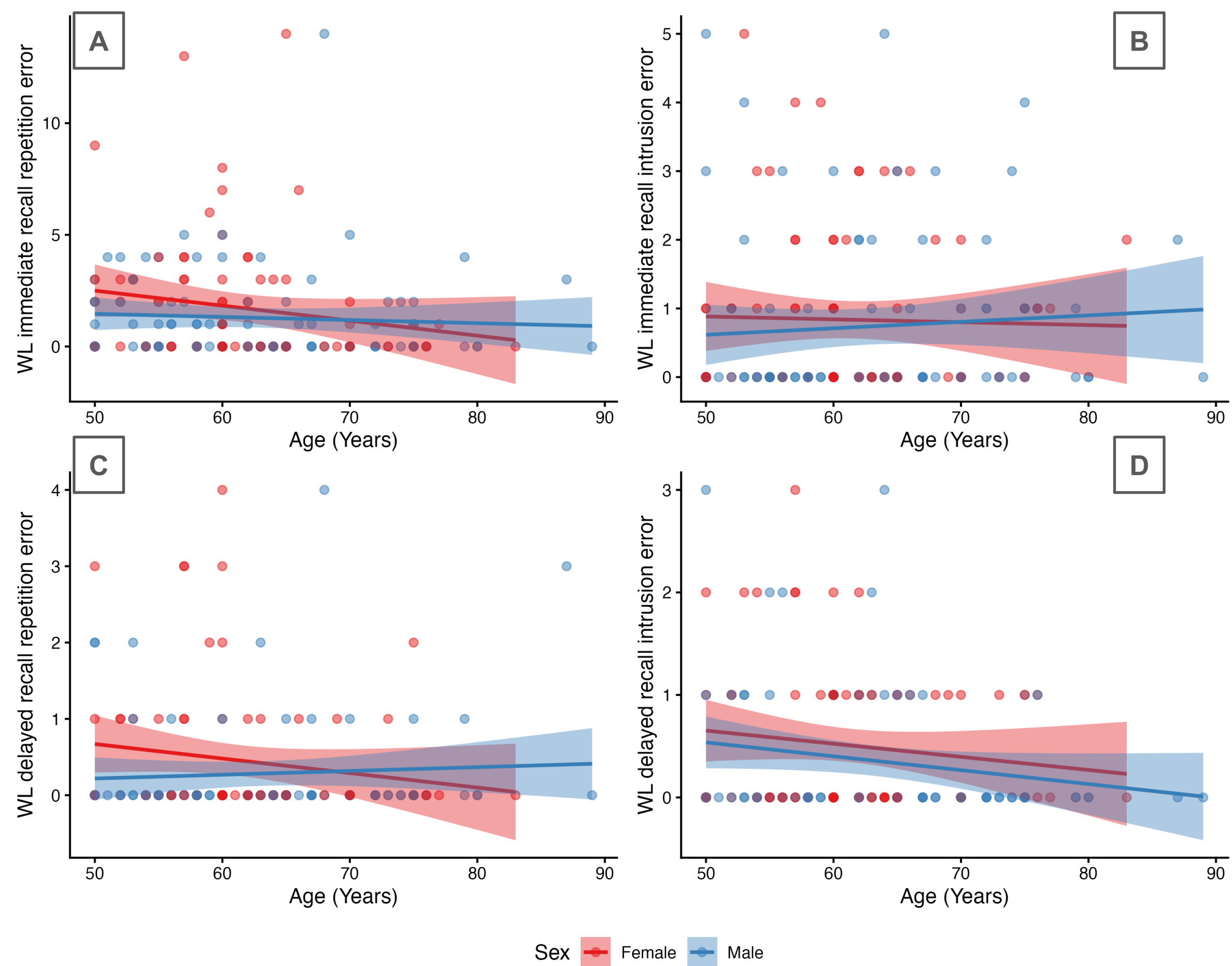


Figure 1. Scatterplots with linear regression lines and 95% CI demonstrating the relationship between age (years) and error frequency during Word List (WL) task, stratified by sex (Female = red; Male = blue).
A) WL immediate recall repetition errors.
B) WL immediate recall intrusion errors.
C) WL delayed recall repetition errors.
D) WL delayed recall intrusion errors.

Overall, the number of errors remained relatively low (except for WL Immediate Recall repetitions) and stable across the 50–90 age range, with minimal divergent trends observed between sexes.

Results (cont.)

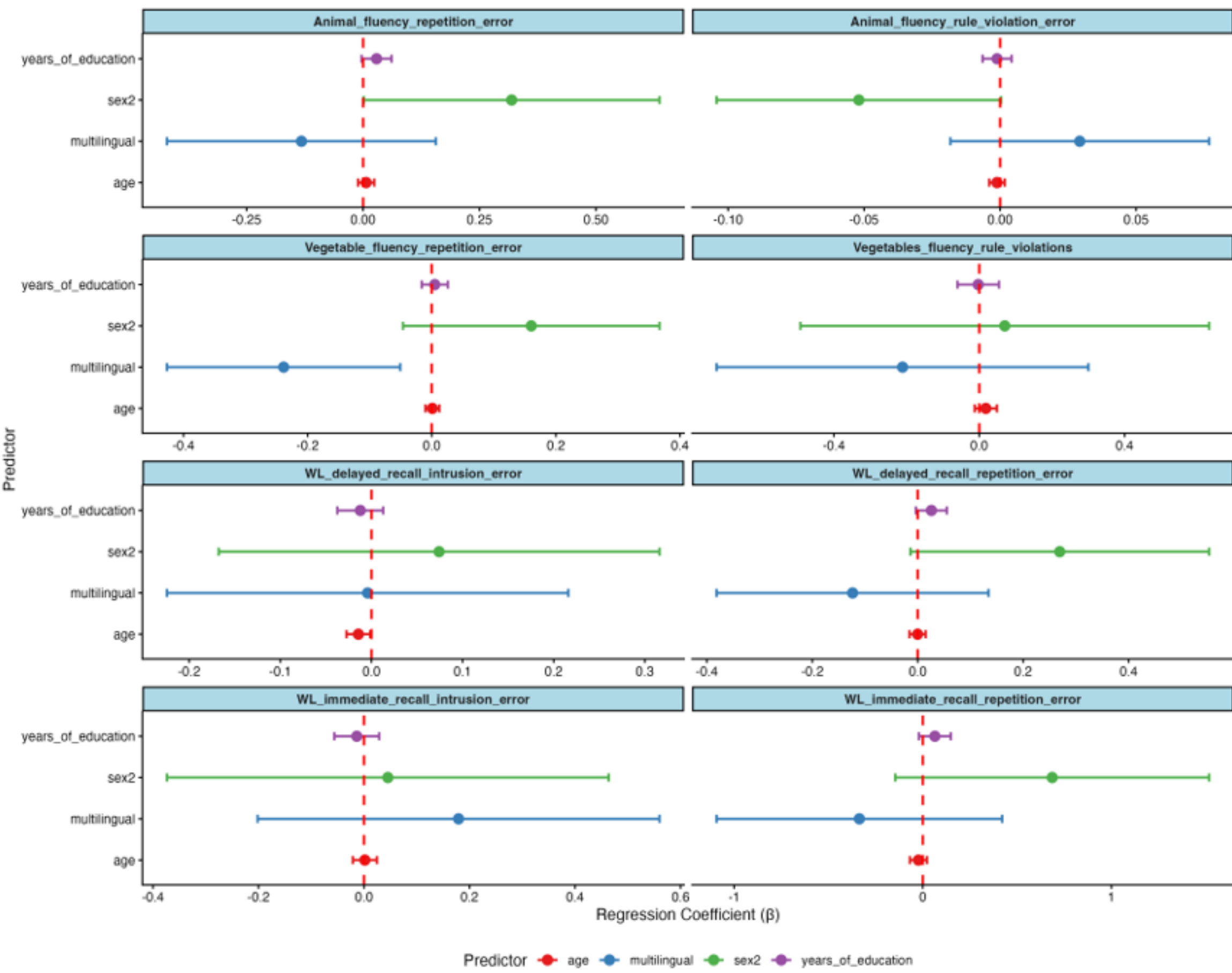


Figure 2. Forest plots showing the standardized regression coefficients β and 95% CI for demographic predictors – age (red), multilingualism (blue), female sex (green), and years of education (purple) – across neuropsychological error categories. Sex and multilingualism exhibit wider confidence intervals across fluency and recall indices without strong, uniform predictive trends

Conclusion

Repetition and intrusion errors are frequent in clinically normal, test-naïve Ethiopian older adults and are associated with demographic characteristics. Our findings highlight the importance of understanding the patterns and determinants of cognitive testing errors to minimize potential misinterpretation of their diagnostic value in African populations.

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