

Quantifying short-term changes in daily functioning: Preliminary validation of change scores

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Background

- Functional decline distinguishes MCI from dementia, but changes in daily functioning may occur gradually.
- Standardized regression-based (SRB) change scores were developed to quantify short-term change on the Independent Living Scales (ILS), a performance-based functional battery.
- However, these ILS change scores require validation in individuals with cognitive and/or functional impairment.

Methods

Study Participants

- 216 older adults classified as either intact (n=186) or impaired (n=30) (Table 1).

Procedures

- Administered the ILS at baseline (Time 1) and one week later (Time 2).
- Five subscales and the Full Scale score were examined (Table 1).

Analyses

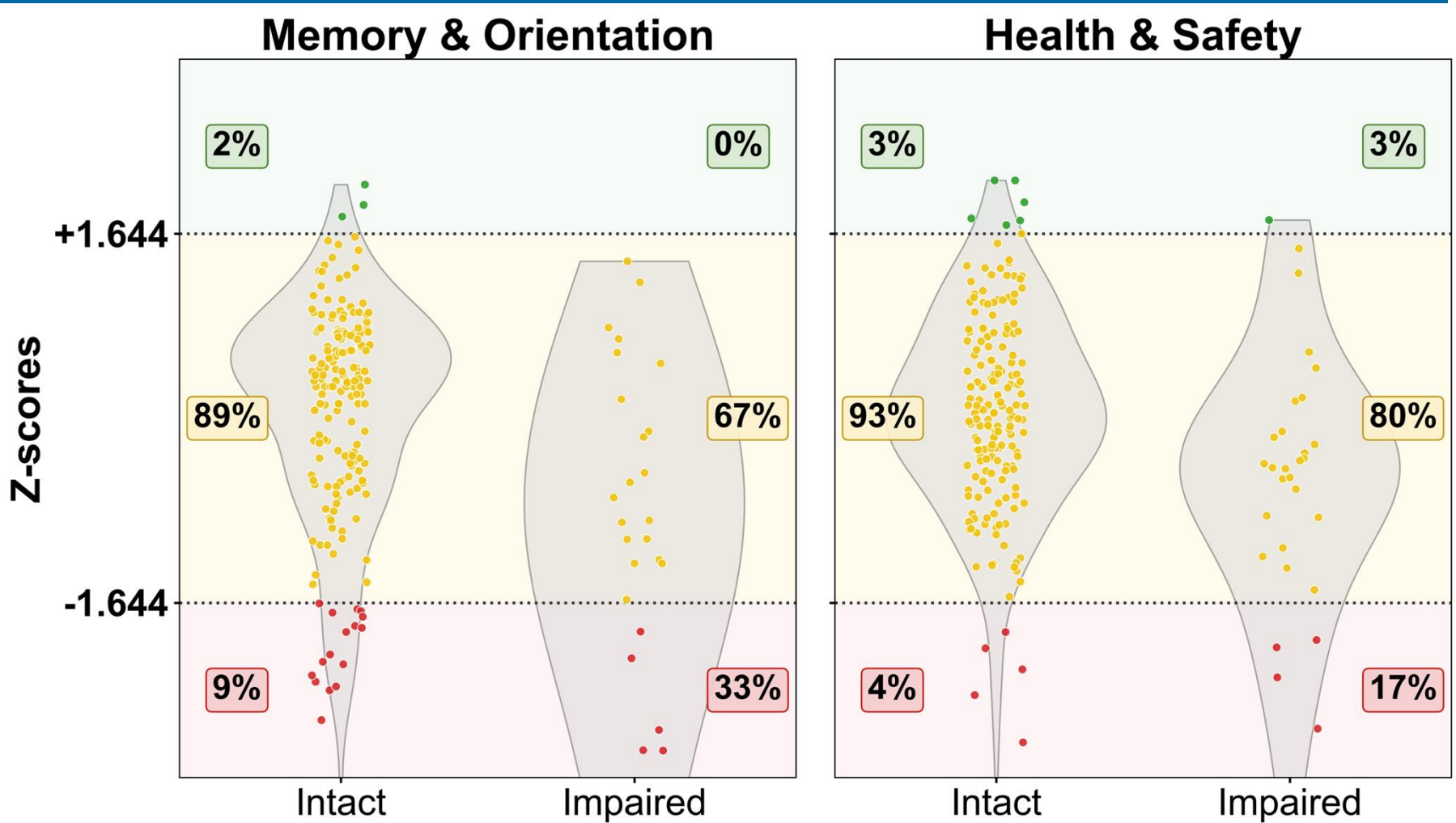
- SRB equations for ILS from Duff et al. (2026) were applied to both groups.
- Independent-samples t-tests compared SRB z-scores between the groups.
- SRB z-scores were classified as smaller-than-expected (<-1.644), stable (-1.644 to +1.644), or greater-than-expected (> 1.644).

Table 1	Intact (n=186)	Impaired (n=30)
Female %	70%	40%
Age	74.85 (5.75)	75.04 (4.99)
Education	16.90 (2.00)	17.03 (1.94)
ILS	SRB z	SRB z
FSS	0.00 (0.99)	-0.65 (1.37)*
M&O	0.05 (0.99)	-1.61 (2.40)***
MM	0.01 (0.99)	-0.25 (1.94)
H&T	0.01 (0.99)	0.08 (1.09)
H&S	0.03 (0.99)	-0.60 (1.17)**
SA	-0.01 (0.99)	-0.32 (1.26)

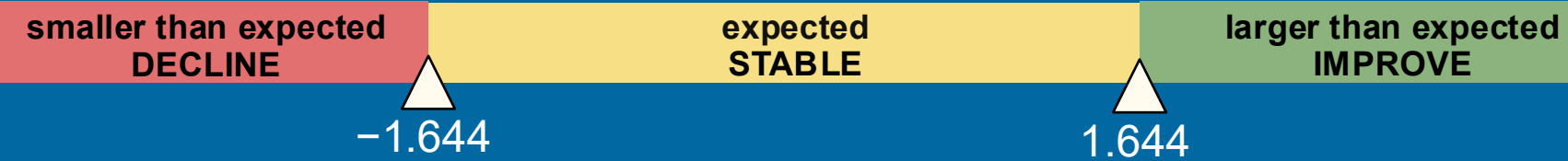
Full Scale Score=FSS, M&O=Memory & orientation; MM=Managing Money; H&T=Home & Transportation; H&S=Health & Safety; SA=Social Adjustment. *p<0.05; ** p<0.01; ***p<0.001.

Validating change scores on a functional scale

Figure 1. SRB z-scores between intact and impaired in Memory & Orientation and Health & Safety subscales.



SRB interpretation



Identifying subtle changes

Acknowledgements

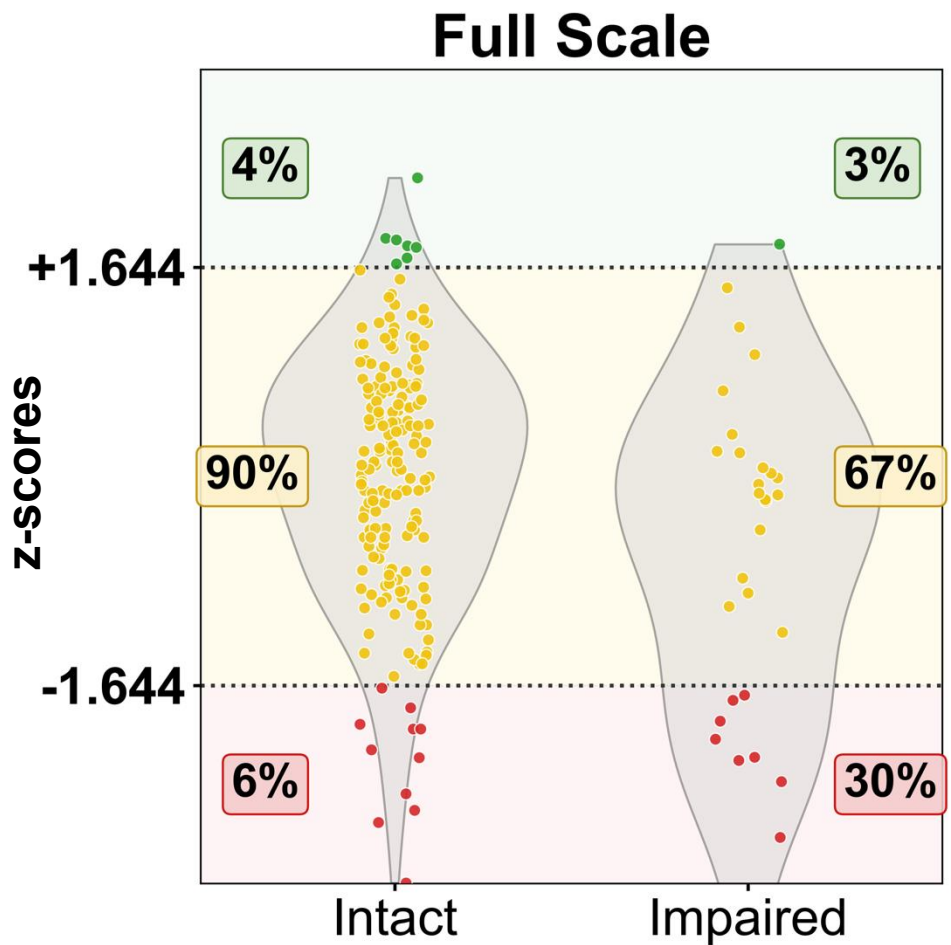
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Results

- SRB-derived z-scores were close to zero in the intact group, but were more negative in the impaired group, especially for Memory & Orientation, Health & Safety (Table 1, Figure 1) and Full Scale scores (Figure 2).
- Most participants showed stable ILS scores over one week, but a larger proportion of the impaired group showed smaller-than-expected changes (i.e., SRB z-scores < -1.644).

Figure 2. SRB z-scores between intact and impaired in Full Scale score.



Discussion

- ILS SRB scores differentiated intact and impaired groups across multiple functional domains, supporting their sensitivity to short-term functional changes.
- Participants in the impaired group showed more negative SRB z-scores, suggesting reduced practice effects relative to expected one-week change.
- SRB scores may provide better interpretative value than raw score changes by accounting for practice effects, regression to the mean, and baseline performance.
- Despite providing preliminary validation for this proof-of-concept, further validation is needed in larger and more diverse cohorts over longer periods of time and with other functional measures.