Assessment of iADL functioning in individuals with subjective cognitive complaints using the Virtual Reality Functional Capacity Assessment Tool (VRFCAT)

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INTRODUCTION

Interactive Environment Consisting of 4 Scenes

Using the Virtual Reality Functional Capacity Assessment Tool (VRFCAT) for assessment of iADL functioning in individuals with subjective cognitive complaints

The Virtual Reality Functional Capacity Assessment Tool (VRFCAT) is a performance-based assessment of iADL functioning that assesses a participant’s ability to complete instrumental activities (called objectives) associated with a shopping trip. In previous studies, the VRFCAT has demonstrated high test-retest reliability and has shown strong relationships to cognition, sensitivity to declines in healthy aging adults, and sensitivity to pronounced functional deficits in schizophrenia (Atkins et al., 2015; Keefe et al., 2016).

We present findings from an ongoing study to collect census-matched normative data in 650 healthy individuals and 60 individuals with subjective cognitive complaints. We describe preliminary findings comparing performance of healthy older adults (≥55 years) and older adults with subjective cognitive complaints

METHODS

Virtual Reality Functional Capacity Assessment Tool (VRFCAT)

Virtual Reality Functional Capacity Assessment Tool (VRFCAT) includes 4 scenes:

1. Exploring the kitchen and creating a shopping list
2. Selecting and paying for the bus to a grocery store
3. Shopping and paying for groceries on the shopping list
4. Selecting and paying for the bus home

Objectives:

- Pick up the recipe on the counter
- Look for ingredients in cabinets and refrigerator
- Cross off the ingredients already in kitchen and pick up list on schedule
- Pick up salad
- Leave the apartment
- Wait for the correct bus to the grocery store and then board it when it arrives
- Pay expired bus fare using exact change
- Select a grocery store able to begin shopping
- Shop for items on in correct quantities
- Pay for groceries using exact change
- Wait for the correct bus home and board it when it arrives
- Pay expired bus fare using exact change

VRFCAT total completion time, error rate and number of forced progressions all demonstrated strong sensitivity to differences between groups (p<.001 for all omnibus and pairwise comparisons). Participants with subjective cognitive complaints performed significantly lower than hOAs without subjective decline in functioning (p<.001 for all comparisons).

Results indicate that the VRFCAT is a sensitive tool to differences between healthy OAs and those with subjective cognitive complaints, and demonstrate convergence between VRFCAT findings, objective cognitive testing, and informant reports of daily function.

DISCLOSURES AND SUPPORT

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Participant Characteristics

<table>
<thead>
<tr>
<th>AGE AND EDUCATION</th>
<th>SEX</th>
<th>AGE YEARS</th>
<th>EDUC. YEARS</th>
<th>MALE</th>
<th>FEMALE</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>Young Adults</td>
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<td>38.75</td>
<td>14.45</td>
<td>159</td>
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<td>259</td>
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<tr>
<td>Healthy Older Adults</td>
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<td>72.00</td>
<td>15.13</td>
<td>180</td>
<td>170</td>
<td>350</td>
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<td>Cognitive Complaints</td>
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<td>6.81</td>
<td>0.78</td>
<td>34</td>
<td>43</td>
<td>77</td>
</tr>
</tbody>
</table>

VRFCAT relationship to informant-reported iADL function and UPSA performance in individuals with cognitive complaints

VRFCAT performance was correlated with relevant aspects of informant-reported iADL function on the ADCS-ADL PI (p<.001 for all comparisons). VRFCAT errors were positively correlated with informant reported difficulties in completing complex activities, p<.05.

Strong correlation between VRFCAT completion time and performance-based function on the UPSA-VIM, r=.53, p<.001

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Strong correlation between VRFCAT completion time and performance-based function on the UPSA-VIM, r=.53, p<.001

CONCLUSIONS

- VRFCAT was a sensitive tool to differences between healthy OAs and those with subjective cognitive complaints, and demonstrated convergence between VRFCAT findings, objective cognitive testing, and informant reports of daily function.
- Findings support further development and customization of the VRFCAT as a performance-based measure of functioning for prevention and early MCI/AD trials.

Figure 2. Sample age, education and sex distribution

Figure 3. Correlation between VRFCAT total time and UPSA-VIM Total in participants with subjective cognitive complaints, r<.05, p<.001

Figure 4. Group differences in VRFCAT performance

Table 1. Participant characteristics

Table 2. Group differences in VRFCAT performance

Table 3. Relationships to cognitive measures

Table 4. Relationships to cognitive measures

Table 5. Relationships to cognitive measures

Table 6. Relationships to cognitive measures