



Using the Naturalistic Action Test (NAT) to Assess the Everyday Activities of Healthy Older Adults and Patients with Mild Alzheimer's Disease

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BACKGROUND

A decline in activities of daily living (ADLs; e.g. food preparation, medication management, driving) is a major hallmark of dementia. Numerous research studies have employed various subjective self-report and caregiver-report assessments of ADLs (e.g., Lawton & Brody, 1969; Katz, 1983). The newly published NAT (Schwartz et al., 2002), however, is a unique assessment of everyday function; it is a standardized, performance-based measure based on neuropsychological principles that evaluates ADLs across several tasks. The NAT was initially developed for the assessment and treatment planning of head-injured (Schwartz et al., 1998) and stroke patients (Schwartz et al., 1999), though the instrument has also been piloted on a heterogeneous group of dementia patients (Giovannetti et al., 2002). Nonetheless, there is limited data regarding the expected performance of older adults and how mild AD patients perform in relation to same aged controls.

GOALS

1. To provide normative data on a group of adults over age sixty.
2. To evaluate the effect, if any, of age on NAT performance in a normal sample of older adults.
3. To determine the clinical utility of the NAT in differentiating mild AD patients from a group of healthy older adults.

Participants

Thirty-five patients with mild Alzheimer's disease (McKhann et al., 1984) and 23 healthy older adults participated in the study. Table 1 shows the demographic variables for the groups.

Table 1.

Demographic Variables

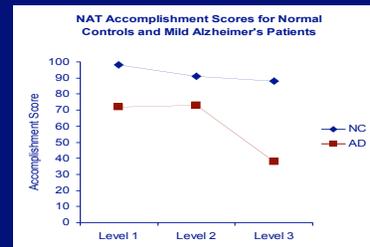
	AD patients (n=35)		Normal Controls (n=23)		t-statistic
	Mean	SD	Mean	SD	
Age	78.7	5.3	75.6	9.6	1.4
Education	11.5	2.3	13.7	2.7	2.2*
MMSE	21.0	1.5	28.2	1.3	19.1**

Note: AD = Alzheimer's Disease; * p < .01; ** p < .001

Procedures

A comprehensive neuropsychological protocol, including the NAT, was administered to all participants. The NAT (Schwartz et al. 2002) is a standardized, objective test that evaluates everyday action impairment across three difficulty levels that are assessed by five tasks. The tasks include: making toast; preparing a cup of coffee; wrapping a gift; packing a lunchbox; and packing a schoolbag. The participant is required to sit at a U-shaped table with the objects needed to complete these tasks set up in a uniform manner. Performance for each difficulty level is based on an Accomplishment Score (AS; % correct out of 100) and NAT Score (ranges from 0 to 6), which takes into account the AS and errors. A Total AS and Total NAT Score (ranges from 0 to 18) can also be computed across all three difficulty levels.

Figure 1.



RESULTS

Normative data are shown in Table 2. In contrast to the younger control sample described in the NAT manual (Schwartz et al., 2002) where 71% received a perfect score, only 48% of our older controls received a perfect score.

Among healthy older adults, age alone accounted for 51% of the variance on the NAT Total Accomplishment score.

As shown in Figure 1, our healthy older adults outperformed the mild AD patients across all three NAT difficulty levels (p < .001). The age-matched controls obtained significantly different scores across all three difficulty levels, receiving higher scores on easier tasks. Dementia patients performed worse on level 3, but scores did not differ between levels 1 and 2. Furthermore, it is notable that 82% of the dementia patients exhibited floor effects on level 3.

A discriminant functional analysis was run to assess the diagnostic utility of the measure. When a Total NAT Score of 14 was used as a cutoff for "not impaired," a minimum number of misclassifications occurred: 85.7% (sensitivity) of dementia patients and 87.0% (specificity) of controls were correctly classified. Overall, the NAT had a high correct classification rate (86.2%) in this sample.

Table 2.

Normative Data for Older Adults on the NAT

NAT Variable	Normal Controls (n=23)	
	Mean	SD
Accomplishment Score		
Level 1	97.83	7.60
Level 2	91.30	17.85
Level 3	87.83	16.76
Total	92.32	11.24
NAT Score		
Level 1	5.74	0.92
Level 2	5.26	1.54
Level 3	4.48	1.90
Total	15.48	1.15

Note: AD = Alzheimer's disease; ***p < .001
NAT = Naturalistic Action Test; L = Level

CONCLUSIONS

1. The normative data for adults over age sixty differ from the younger normals reported in the NAT manual. Therefore, we recommend using the norm in Table 2 when evaluating geriatric populations.
2. Consistent with our initial conclusion, we identified a significant effect of age in our normative group.
3. A significant difference in the NAT Total Score was identified between the mild AD group and our normative group. Likewise, the high sensitivity and specificity of the NAT in our sample suggests fairly robust diagnostic validity. Nonetheless, the results across the three NAT difficulty levels were less stable.

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