



# A Comparison of Two Scoring Methods for Naturalistic Action Assessment

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## I. Introduction

Neurologically-impaired patients often experience problems in naturalistic action (e.g., grooming, meal preparation, etc.); however, neuropsychologists rarely assess this ability in the clinic. This may be because traditional methods require videotaping and extensive training of coders. The Naturalistic Action Test (NAT; Schwartz et al., 2002a,b) is a standardized, performance-based measure that employs an on-line, easy to use coding system (NAT Score). **The present study compared the NAT Score to a traditional coding method.**

## II. Methods

**Participants-** Videotapes of 100 patients and 28 healthy controls (HC) performing the NAT were reviewed. Videotapes were obtained for previous studies (Schwartz et al., 2002b; Giovannetti et al., 2000). The patient sample included individuals undergoing inpatient rehabilitation for closed head injury (CHI N = 11) or cerebrovascular accident (CVA N = 35) as well as individuals with degenerative dementia (N = 54). Table 1 shows demographic data.

**Table 1: Demographic Characterization of the Sample**

	HC n = 28 M (SD)	TBI n = 11 M (SD)	CVA n = 35 M (SD)	Dementia n = 54 M (SD)
Age	55 (17)	29 (9)	60 (12)	76 (9)
Education	13 (3)	11 (2)	11 (3)	12 (2)

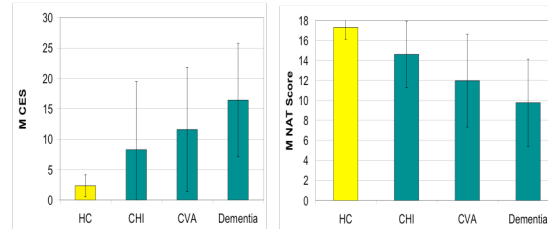
**NAT Procedures** - Participants performed 3 everyday tasks with little guidance from the examiner: 1) prepare toast and coffee; 2) wrap a gift while avoiding distractor objects (gardening clippers, stapler, etc.); and 3) pack a lunch box and a school bag while several necessary objects (knife, thermos lids) are stored in a drawer containing additional potentially distracting objects (ice tongs, coupons, etc).

**NAT Score (range 0 - 18)** - an on-line coding system that combines the percent of steps accomplished and the occurrence of a subset of 25 key errors. For example, a score of 18 is assigned when all steps are performed correctly (100% accomplishment) and < 4 key errors are committed (ordinal level variable).

**Comprehensive Error Score (CES)** - a detailed coding system that requires videotape analysis and classification of all errors (e.g. omissions, substitutions, sequence, etc.; ratio level variable).

## III. Results

**Figure 1: Mean NAT Score and CES across Groups**



The NAT Score and CES significantly correlated in each patient group (dementia  $r = -.79$ ; CVA  $r = -.82$ ; CHI  $r = -.71$ ,  $p < .01$  for all), but not controls ( $r = -.32$ ,  $p = .09$ ).

Overall, NAT Score captured only 59% of CES errors. Table 2 shows the breakdown across group.

**Table 2: Total Errors Coded across Method and Group**

	HC	TBI	CVA	Dementia
CES	61	91	406	888
NAT Score	24	44	235	557
% CES Errors Coded with NAT Score	39%	48%	58%	63%

There was a high rate of agreement in classifying patients as "impaired" compared to controls (+/- 2 SD; see Table 3).

**Table 3: Number of Impaired Patients and % Agreement across Method**

	NAT Score	CES	% Agreement
CHI	4	6	82%
CVA	21	23	83%
Dementia	47	46	87%

Finally, both methods significantly correlated with functional disability (CHI & CVA - Functional Independence Measure; Dementia - Lawton & Brody ADL/IADL Scale; see Table 4).

**Table 4: NAT Score and CES x Functional Disability Measures**

	NAT Score <i>r</i>	CES <i>r</i>
FIM-CVA & CHI (n = 46)	0.51*	-.47*
ADL/IADL - Dementia (n = 54)	-0.62*	.60*

## IV. Conclusions

The NAT Score is comparable to the traditional, labor-intensive CES method in detecting impairment in neurologically-impaired patients

Correlations with functional disability measures indicate that the NAT Score has comparable concurrent validity to the CES.

We recommend the NAT score as a valid and reliable method for the efficient, on-line assessment of naturalistic action impairment in the clinic (Schwartz 2002a,b).

The CES captures substantially more errors than the NAT Score and is recommended for use in research (Schwartz et al., 2002a).

## V. References

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## VI. Acknowledgements

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