



# Naturalistic Action Impairment in Chronic Schizophrenia/Schizoaffective Disorder

Rachel K. Kessler, Tania Giovannetti, Laura MacMullen, Julie E. Rosner & Laura Brennan

Department of Psychology, Temple University

## Introduction

Everyday action is severely compromised in individuals with schizophrenia (SZ), but few studies characterize the nature of this impairment using performance-based measures. We examined the everyday action abilities of SZ individuals using one such measure, the Naturalistic Action Test (NAT) with the following aims:

- 1) To determine if SZ individuals exhibit impaired performance on the NAT relative to healthy controls (HC).
- 2) To compare the NAT performance of this population to that of dementia patients (DE), who have been shown to demonstrate deficient NAT performance and a pattern of errors that is strikingly similar to other neurological patient populations (e.g., traumatic brain injury, right CVA & left CVA)

## Methods

**Participants** - 21 inpatients with chronic schizophrenia ( $N=16$ ) or schizoaffective disorder ( $N=5$ ) were administered the NAT. All dementia ( $N=54$ ) and healthy control ( $N=28$ ) data were provided by either the NAT manual (Schwartz et al., 2001) or published reports in the literature (Giovannetti et al., 2002). Table 1 presents demographic information for participants.

Table 1. Means and SDs of demographics

	Age	MMSE	IQ	Education	Duration
SZ	46 (10)	26 (3)	78 (12)	13 (3)	24 (10)
DE	76 (9)	-	-	12 (2)	-
HC	55 (17)	-	-	13 (3)	-

**NAT Procedures** – participants were videotaped while performing 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)** - a measure of overall impairment 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.

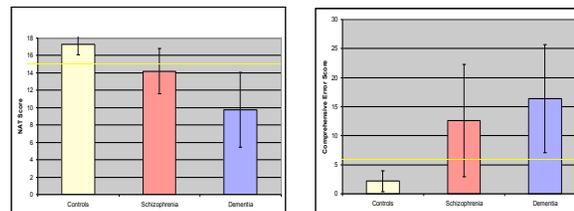
**Comprehensive Error Score (CES)** - a detailed classification of all errors including omissions, substitutions, sequence errors, perseverations, tool omissions, gesture errors, spatial errors, action additions, and quality errors.

**Accomplishment Score (range 0 - 100)** - the percent of task steps correctly performed.

## Results

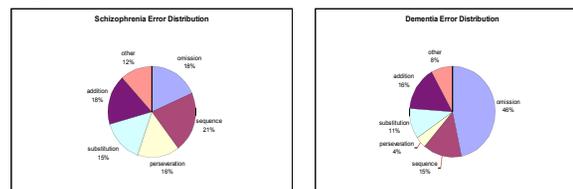
**General Impairment** - SZ individuals performed in the impaired range on the NAT ( $M$  NAT score = 14.2,  $SD$  = 2.56), as indicated by data in the NAT manual (NAT cutoff score = 14.9). On average, SZ participants made 12.6 errors on the NAT ( $SD$  = 9.75) whereas healthy controls made only 2.2 ( $SD$  = 1.8).

Figure 1. Mean NAT Scores and CES across groups



**Error Distribution** - The distribution of error types differed for SZ and dementia participants. More specifically, SZ individuals made relatively fewer omissions ( $\chi^2 = 64.6, p < .01$ ), more perseverations ( $\chi^2 = 44.7, p < .01$ ) and more sequencing errors ( $\chi^2 = 5.9, p < .02$ ) than individuals with dementia.

Figure 2. Distribution of errors for SZ and DE participants



Additionally, whereas individuals with dementia exhibited a significant negative correlation between commission errors and overall NAT accomplishment scores ( $r_s = -.42, p = .001$ ), SZ participants showed no such relationship between these NAT variables. Essentially, dementia patients who produced a high rate of commission errors also failed to accomplish a high percentage of task steps. By contrast, SZ individuals who produced a high rate of commission errors still completed a high percentage of task steps.

## Conclusions

Inpatients with chronic schizophrenia/schizoaffective disorder exhibit impaired performance on the NAT, suggesting that the NAT is a sensitive measure for capturing the everyday action errors of this population.

Moreover, individuals with schizophrenia demonstrate an error pattern on the NAT that is distinct from that of other neurologically compromised populations (i.e. dementia patients) and may reflect differential cognitive deficits.

SZ individuals show high rates of errors in the context of high rates of accomplishment. This unique pattern suggests deficits in the executive planning aspects of everyday action with relative sparing of task knowledge.

The NAT may be useful for distinguishing the nature of action impairment across neurologically-impaired populations and appears to be a promising tool for assessing and describing everyday action impairments in schizophrenia.

## References

Giovannetti, T., Libon, D.J., Buxbaum, L.J., & Schwartz, M.F. (2002). Naturalistic Action Impairments in Dementia. *Neuropsychologia, 40*, 1220 –1242.

Schwartz, M.F., Buxbaum, L.J., Ferraro, M., Veramonti, T., & Segal, M. (2001). *Naturalistic Action Test manual*. Orlando, FL: Psychological Assessment Resources

## Acknowledgements

The authors are grateful to the patients and staff of Temple University-Episcopal Hospital's Extended Acute Care Unit and Girard Hospital's inpatient psychiatry unit. We thank Drs. Kim, Zilbering, Hayburn, and Ladenheim and Ms. Terri Atwood for their help with participant recruitment.