

# A comparison of basic and social cognition between schizophrenia and schizoaffective disorder

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## Abstract

We compared basic and social cognition in individuals with schizophrenia and schizoaffective disorder. 199 individuals with schizophrenia and 73 with schizoaffective disorder were compared on measures of executive function, verbal and nonverbal memory, and processing speed, as well as two measures of social cognition, the Hinting Task and the Bell Lysaker Emotion Recognition Task. The samples did not differ significantly on the basic cognitive measures, however individuals with schizoaffective disorder performed significantly better than those with schizophrenia on the Hinting Task, a measure of Theory of Mind. Results provide limited support for a taxonomic distinction between the two disorders.

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## 1. Introduction

Since the introduction of the term “schizoaffective disorder” (Kasanin, 1933), psychiatric taxonomists have debated the appropriate classification of this disorder in relation to schizophrenia and affective disorders. In order to determine the similarity, or distinctness, of these disorders, a host of variables have been examined and compared between the groups, including course, symptoms, family history, treatment response, and cognition, to name a few (Taylor, 1992). Results of neurocognitive comparisons between schizophrenia and

schizoaffective disorder have been mixed. The majority of research suggests no, or only small, cognitive differences between the two disorders (Bornstein et al., 1990; Evans et al., 1999; Goldstein et al., 2005; Gooding and Tallent, 2002; Miller et al., 1996; Reichenberg et al., 2002; Townsend et al., 2001). In cases where differences are noted, the pattern of those differences is unclear, with some researchers reporting that cognitive function in schizoaffective disorder is more impaired than in schizophrenia (Silverstein et al., 1988), and others reporting that cognitive function in schizoaffective disorder is less impaired than in schizophrenia (Stip et al., 2005).

Recently, it has been suggested that cognition can be meaningfully subdivided into basic cognition, which includes functions such as attention, memory and problem-solving, and social cognition, which pertains

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to the “cognitive processes involved in how [individuals] think about themselves, other people, social situations and interactions” (Penn et al., 1997). Investigators have further subdivided the domain of social cognition into affect perception, attributional style, and Theory of Mind (ToM). Though clearly overlapping to some extent, there are indications that the basic and social components of cognition are unique, as evidenced by distinct pathways (Pinkham et al., 2003) and different predictive value in relation to functional outcomes (Brekke et al., 2005; Kee et al., 2003; Pinkham and Penn, 2006; Sergi et al., 2006).

We are aware of only a few studies that examine social cognitive function differences between schizophrenia and schizoaffective disorder. In a study of premorbid social and academic adjustment in 113 first episode individuals, Norman and colleagues (Norman et al., 2005) note that although premorbid academic adjustment was better in schizoaffective patients as compared to schizophrenic patients, the two groups did not differ in premorbid social adjustment, as assessed by a premorbid adjustment scale rated based on patient and informant information. In a study examining Theory of Mind (ToM), a component of social cognition having to do with the ability to understand the mental states of others, Greig and colleagues (Greig et al., 2004) compared Hinting Task performance among subtypes of schizophrenia and schizoaffective disorder, and found that although patients with the disorganized subtype of schizophrenia performed more poorly than patients with schizoaffective disorder, there were no performance differences between schizoaffective disorder and any of the other schizophrenia subtypes. Lastly, in a recent study which used a modified administration of the Picture Arrangement subtest to measure social cognition, Shean and colleagues (Shean et al., 2005) reported significantly better performance for schizoaffective subjects. This difference disappeared, however, when premorbid intelligence, a variable that significantly differed between the two samples, was added to the analyses as a covariate.

In sum, the majority of studies of basic cognitive function suggest that schizoaffective patients perform similarly to or somewhat better than schizophrenic patients, but given the dearth of studies comparing social cognition between the two disorders, no summary statement about social cognition can be made. In the current paper, we combined available data from two large studies with schizophrenia and schizoaffective disorder samples, in order to compare the patterns of basic and social cognitive function between the two disorders. Based on previous literature, we hypothesized

little or no advantage for the schizoaffective sample on the basic cognitive measures. We did not have a directional hypothesis for social cognitive differences.

## 2. Method

### 2.1. Participants

Baseline neuropsychological performance data were obtained from 272 participants with Diagnostic and Statistical Manual of Mental Disorders, DSM-IV (American Psychiatric Association, 1994) diagnoses of schizophrenia or schizoaffective disorder, as confirmed by structured clinical interview administered by Ph.D.-level psychologists trained in SCID procedures by the National Center for Schizophrenia Research at the VA Connecticut Healthcare System West Haven, CT. Questions of diagnosis were resolved through consensus and consultation with the Center. Participant data were obtained between 1998 and 2003 from two consecutive vocational rehabilitation studies at VA Connecticut Healthcare System, West Haven, CT. All participants provided written informed consent, and the studies were approved by the local Institutional Review Board. Ascertainment strategies were the same for both studies. Potential participants were referred to the study by their treating clinicians after expressing interest in participating in work rehabilitation. Although the majority of participants were referred from the VA outpatient clinic, participants were also referred from the Connecticut Mental Health Center outpatient clinic, so that the sample would include more women and non-veterans. Inclusion criteria for both studies were as follows: diagnosis of schizophrenia or schizoaffective disorder, clinical stability (as evidenced by no psychiatric hospitalizations, and no housing or psychiatric medication changes in past 30 days). In order to participate, patients with a lifetime diagnosis of substance abuse or dependence had to have not met diagnostic criteria for the past 30 days. Patients with a history of traumatic brain injury or known neurological diseases were excluded.

### 2.2. Instruments and procedures

Participants in both studies completed neuropsychological test batteries at baseline. One of the social cognitive measures, the Hinting task, was added in the second study; therefore data for only 150 participants was available for that measure. Separate MANOVAs were carried out for the basic cognitive and social cognitive variables, respectively.

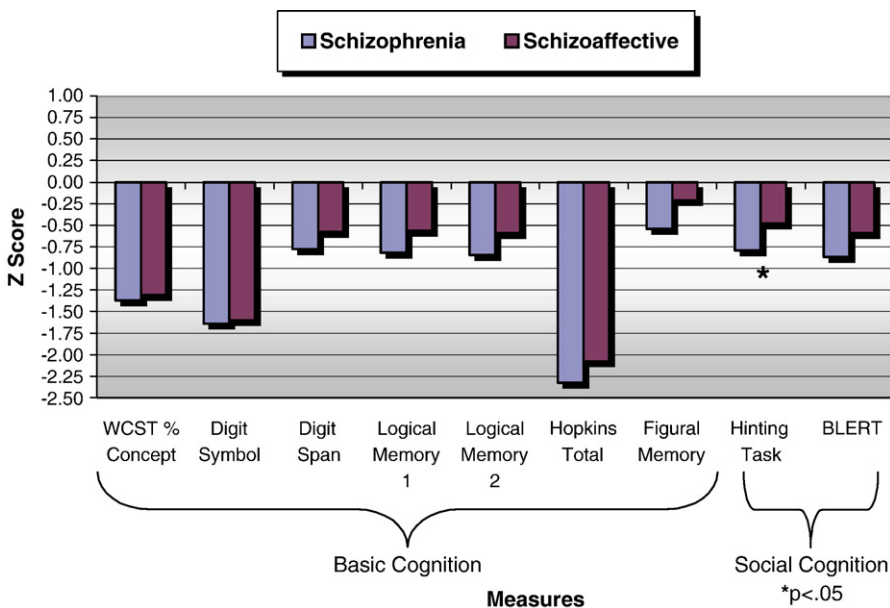


Fig. 1. A comparison of schizophrenia and schizoaffective sample on cognitive measures.

2.2.1. Basic cognitive measures

Verbal and nonverbal memory tasks included Logical Memory I and II, and Figural Memory subtests from the Wechsler Memory Scale, Revised (WMS-R, (Wechsler, 1987)). Also included were the Digit Span from the WAIS-III (Wechsler, 1997), as well as the Trial 1–3 total score from the Hopkins Verbal Learning Test, Revised (HVLT-R, (Brandt and Benedict, 2001)). Other tasks included the percent conceptual level responses variable from the Wisconsin Card Sorting Test (WCST, (Heaton, 1981)), an executive function measure, and the Digit Symbol Substitution subtest from the WAIS-III (Wechsler, 1997), a measure of processing speed. Norms used in Fig. 1 were obtained from the published manuals.

2.2.2. Social cognitive measures

Two measures of social cognition were assessed. The Hinting Task (Corcoran et al., 1995) is a Theory of Mind task consisting of 10 vignettes, where the examinee is presented with a dyad social interaction and asked to make inferences about the intent behind a hint dropped by one of the characters. Each response is given a score of 0, 1, or 2 for a total score range of 0 to 20. The North American version of this test was used (Greig et al., 2004), in which some of the wording is changed to aid in comprehension. The Bell Lysaker Emotion Recognition Task (BLERT, (Bell et al., 1997)) is an affect perception task that consists of 21 short video clips where the actor reads one of three neutral scripts, while displaying one of seven emotions. The examinee is asked to name the

emotion displayed. Scores range from 0 to 21. Norms used in Fig. 1 were obtained from a sample (n=85) of people attending a community college, and are unpublished.

3. Results

Table 1 presents demographic information for the schizophrenia and schizoaffective disorder samples. The schizoaffective sample was significantly more likely to be female, ever married, and Caucasian. There were no

Table 1 Demographics for schizophrenia and schizoaffective samples

Variable	Schizophrenia (n=199)	Schizoaffective (n=73)
Age, mean (SD)	42.72 (8.18)	44.01 (9.68)
Gender (male) *	179 (90%)	57 (78%)
Marital Status (ever married)**	61 (31%)	37 (51%)
Race (Caucasian)***	117 (59%)	53 (73%)
WAIS-III IQ estimate (SD)	88.37 (11.77)	90.89 (14.21)
Education, mean (SD)	12.85 (2.69)	13.47 (2.27)
Age 1st hospitalization, mean (SD)	25.48 (7.10)	27.21 (7.98)
Lifetime hospitalizations, mean (SD)	9.91 (11.46)	9.76 (8.49)
PANSS total, mean (SD)	75.81 (15.42)	74.18 (12.48)

\* p<.01.  
 \*\* p<.001.  
 \*\*\* p<.05.

differences in WAIS full-scale IQ estimates. Because of the disproportionate number of females in the schizoaffective sample, gender was used as a covariate in the analyses. Variables that did not meet normality assumptions were *z*-transformed prior to analyses. The overall MANCOVA of basic cognitive variables was not significant ( $F(7, 263)=1.73, p=.10$ ), indicating that the schizophrenia and schizoaffective disorder groups did not differ significantly on basic cognitive measures. Although not interpretable in light of the non-significant overall MANCOVA, an examination of included variables indicated significant effects of diagnosis for Logical Memory I ( $F(1, 263)=6.23, p=.01$ ), Logical Memory II ( $F(1, 263)=6.81, p=.01$ ) and Figural Memory ( $F(1, 263)=4.64, p=.032$ ). The overall MANCOVA for the social cognitive measures was significant ( $F(2, 145)=3.42, p=.04$ ). The two diagnostic groups differed significantly on the Hinting Task ( $F(1, 145)=6.14, p=.01$ ), though not on the BLERT ( $F(1, 145)=2.00, p=.16$ ). In all cases where the two groups differed, the schizoaffective sample had less impaired performance. Fig. 1 illustrates mean performance on these variables for the schizophrenia and schizoaffective groups, plotted against published and unpublished healthy control norms. Normative information is presented for illustrative purposes only, and no separate analyses were performed comparing the schizophrenia and schizoaffective samples against norms.

#### 4. Discussion

Interpreted rigorously, our findings suggest no statistically significant differences on basic cognitive measures between schizophrenia and schizoaffective samples, and a difference favoring the schizoaffective group on one of the social cognition measures, the Hinting Task. If univariate analyses are also taken into account, additional differences between the two groups are observed on a story and figure recall tasks, again favoring the schizoaffective group. The pattern of basic cognitive findings is consistent with the existing literature, and provides only meager evidence for a taxonomic distinction between schizophrenia and schizoaffective disorder. As seen in Fig. 1, both samples perform below the norms on all measures, with particularly striking impairments on HVL-T-R and the Digit Symbol Substitution tests.

The overall social cognition MANCOVA was significant, a finding that provides limited support for a taxonomic distinction between the two disorders. However, this was accounted for by only one of the two included measures. As noted earlier, social cognition has

been subdivided into emotion perception, Theory of Mind, and attributional style, and the two social cognitive measures examined in the current analyses are associated with different components of social cognition. Since the Hinting Task and not the BLERT was significant, we can only speculate that schizoaffective patients may have more intact Theory of Mind performance, but may have impairments similar to schizophrenic patients with respect to emotion perception.

Several limitations to the current study should be noted. Because of sample size differences, the social cognitive MANCOVA did not take advantage of all datapoints. However, this analysis was preferred over separate ANCOVAs since it would reduce the likelihood of Type I error. Also, this was a sample of convenience, culled from two separate studies, neither of which was designed to specifically answer the question of cognitive differences between the two groups. Because of this, the number of social cognitive measures examined is limited to only two, and different findings may emerge from a more detailed examination of multiple social cognitive measures. Also, the majority of participants were veterans, a sample often associated with later age of onset and better premorbid function than found in other samples, a fact that may limit the generalizability of findings. Finally, as is the case with all analyses of multiple cognitive tests, potential issues of differences in test difficulty, normative samples, and other psychometric properties must be taken into account.

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