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Predictors of current functioning and functional decline in schizophrenia

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ABSTRACT

Positive, negative, and cognitive symptoms of schizophrenia may affect functional outcomes. However, these factors alone do not account for a large percentage of variance in outcomes. We investigated demographic, cognitive, symptom, and functional capacity predictors of current functional status in 280 outpatients with schizophrenia or schizoaffective disorder. Functional decline over the lifespan was also examined in a subset of participants. Stepwise regressions modeled predictors of current functional status and functional decline as measured by the Assessment of Lifespan Functioning Attainment (ALFA). ALFA functional domains included paid employment, independence in living situation, romantic relationships, close friendships, and recreational engagement. More severe depressive symptoms were consistently associated with worse current community integration (lower levels of close friendships and recreational engagement). Better working memory performance was associated with higher rates of current paid employment. There were no consistent modifiable predictors of decline in functioning, but women reported less functional decline in the domains of employment and close friendships than men. Better cognitive performance was associated with less decline in living independence and romantic relationships, but more decline in paid employment and recreational engagement. Increased assessment and treatment of comorbid depressive symptoms may improve functional outcomes in people with schizophrenia.

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1. Introduction

Schizophrenia is now largely considered to be a group of syndromes, rather than a single illness, due to significant genetic (Sebat et al., 2009; Stefansson et al., 2008; Walsh et al., 2008), symptom (Carpenter and Buchanan, 1994; Liddle and Morris, 1991; Wagman, 1988), and social risk factor (Cantor-Graae and Selten, 2005; Janssen et al., 2004; Zammit et al., 2004) heterogeneity. While different factors are associated with the various syndromes (Liddle, 1987; Liddle et al., 1992; Silverstein et al., 2000; Williams et al., 2000), schizophrenia spectrum disorders consistently lead to poor functional outcomes across multiple domains, including employment, living independence, and social functioning (Green et al., 2000; Green et al., 2004; Harvey et al., 1998).

Currently validated measures of real world functioning (Leifker et al., 2011) only consider a snapshot in time and do not provide a comprehensive lifespan perspective for outcomes relevant to schizophrenia. In addition, the factors predicting current functional status may be

different from predictors of functional decline. Moreover, the factors associated with functional outcomes vary greatly (Barnes et al., 2008; Kolakowska et al., 1985; Marwaha and Johnson, 2004; Milev et al., 2005; Sabbag et al., 2012; Wölwer et al., 2014). Therefore, improved characterization of the set of factors that moderate functional outcomes in schizophrenia may be useful in developing and targeting treatments.

Studies of lifespan functioning in schizophrenia are very few and have been limited primarily to investigations of neurocognitive impairment (Friedman et al., 2001; Kalache et al., 2014; Kurtz, 2005) or qualitative assessments (Shepherd et al., 2012). A new scale, the Assessment of Lifespan Functioning Attainment (ALFA; Joseph et al., 2015), enables the quantitative assessment of various stages in lifespan functioning including current status and post-psychosis decline for five different functional domains: paid employment, living independence, romantic relationships, close friendships, and recreational engagement.

The aim of this study was to model predictors of current functional status and post-psychosis functional decline using the ALFA scale in a large sample of individuals with schizophrenia-spectrum disorders. We predicted that demographic, illness burden, cognitive, and functional capacity factors would account for a significant amount of variance in functional outcomes.

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2. Materials and methods

2.1. Study participants and procedures

Outpatients with schizophrenia or schizoaffective disorder ($n = 280$; 59% with schizophrenia, 41% with schizoaffective disorder) were recruited from the University of California, San Diego (UCSD) Outpatient Psychiatric Services clinic and the broader San Diego community and were enrolled in a study examining genetic predictors of cognitive and functional outcome in schizophrenia. The same sample was used in our initial descriptive and factor analytic study of the ALFA (Joseph et al., 2015). The study was approved by the Institutional Review Board and all participants provided written informed consent. Each participant completed the study assessments within a two-week period.

Participants were excluded if they: 1) had a DSM-IV TR (APA, 2000) diagnosis of substance abuse or dependence within six months of study entry; 2) had a diagnosis of intellectual disability or neurological disorders affecting cognitive functioning (including brain injury with loss of consciousness > 10 min); 3) were not fluent English speakers. The demographic and symptom characteristics, as well as current functional status for the five ALFA domains, are shown in Table 1. Information regarding current functional status was available for all 280 participants, whereas information on decline in functioning was available for a subset of the sample with psychosis onset after age 18 ($n = 93$; see Table 1).

2.2. Psychiatric and substance history measures

Psychiatric history indices were obtained from the Diagnostic Interview for Genetics Studies (Nurnberger et al., 1994). These indices included history of suicide attempts, history of heavy alcohol and substance use, history of smoking, and history of antisocial personality characteristics prior to age 15. Heavy alcohol use was defined as ≥ 8 drinks per week for women and ≥ 15 drinks per week for men (Dawson et al., 2005). Heavy substance use for cannabis, cocaine, and other stimulants was defined as 30 or more days of continuous substance use.

Table 1
Demographic and clinical characteristics of the study sample ($n = 280$) and subsample ($n = 93$) with decline in functioning data available.

	Sample ($n = 280$)		Subsample ($n = 93$)	
	%/M	SD	%/M	SD
Sex (% male)	66.8	–	63.4	–
Race (% White)	46.8	–	38.7	–
Ethnicity (% Hispanic)	20.0	–	15.1	–
Suicide attempt (% reporting at least one lifetime attempt)	46.8	–	40.9	–
Current marital status (% single, never married)	58.2	–	50.5	–
Current smoker (%)	61.8	–	59.1	–
Current paid employment (%)	7.9	–	5.4	–
Current living independence (%)	76.4	–	75.3	–
Current romantic relationships (%)	40.7	–	44.1	–
Current close friendships (%)	75.0	–	72.0	–
Current recreational engagement (%)	65.0	–	57.0	–
Age, years	48.1	10.2	49.0	8.9
Education, years	12.3	2.4	12.5	2.5
Age of psychosis onset, years	22.2	9.7	28.4	8.3
Duration of psychosis, years	25.9	12.2	20.7	9.4
Premorbid IQ estimate	92.8	15.4	92.6	13.4
HAMD depressive symptom severity	6.2	5.8	6.3	6.4
SANS negative symptom severity	29.2	17.3	21.5	16.7
SAPS positive symptom severity	27.6	16.9	19.4	13.0
Antisocial characteristics	1.7	2.4	1.3	2.0
Total chlorpromazine equivalent (mg)	386.8	249.9	380.9	206.7

Note. HAMD = Hamilton Depression Rating Scale, SANS = Scale for Assessment of Negative Symptoms, SAPS = Scale for the Assessment of Positive Symptoms.

2.3. Current symptom assessments

2.3.1. Scale for Assessment of Positive Symptoms (SAPS) (Andreasen, 1984)

The SAPS was used to assess four positive symptom domains of psychopathology in schizophrenia: 1) hallucinations; 2) delusions; 3) bizarre behavior; and 4) formal thought disorder.

2.3.2. Scale for Assessment of Negative Symptoms (SANS) (Andreasen, 1983)

The SANS was used to assess negative symptoms of psychopathology in schizophrenia in five domains: 1) affective flattening or blunting; 2) avolition-apaty; 3) avolition-apaty; 4) attention; and 5) anhedonia-asociality.

2.3.3. Hamilton Depression Scale (HAMD) (Hamilton, 1960)

The HAMD was used to assess current depression symptoms.

2.4. Functional capacity

2.4.1. UCSD Performance-based Skills Assessment 2 (UPSA-2) (Patterson and Goldman, 2005)

The UPSA-2 is a measure of functional capacity that assesses ability to perform tasks related to independent living skills in six domains: finance (e.g., write a check to pay a utilities bill), communication (e.g., call a doctor to reschedule an appointment), transportation, recreation planning, household chores (e.g., grocery shopping) and medication management. Prior studies suggest good test-retest reliability for the original UPSA (Leifker et al., 2010), which does not include the medication management ability assessment (MMAA). For the UPSA-2, raw subscale scores for all domains except the MMAA were converted to a composite score out of 100 (Patterson and Goldman, 2005). For the MMAA, a total raw score was computed.

2.5. Self-reported functioning

2.5.1. Assessment of Lifespan Functioning Attainment (ALFA) (Joseph et al., 2015)

The ALFA is a quantitative self-report measure of past and current functioning comprising five domains: 1) paid employment (including full-time post-secondary education); 2) living independence; 3) participation in romantic relationships; 4) maintenance of close friendships; and 5) engagement in recreational activities with non-family members. In part 1, current status for each domain was coded 0 for “not participating” and 1 for “currently participating.” In part 2, to determine variation in functioning for specific epochs of adulthood (i.e., age 18–20, 21–30, 31–40, 41–50, etc., up to the individual’s current age) participants were queried as to the number of years that they were engaged in activities corresponding to each ALFA domain. The percentage of years of engagement in each domain from age of 18 to age of psychosis onset was defined as “Pre-Psychosis Functioning,” and percentage of years of engagement in each domain from age of psychosis onset to current age was defined as “Post-Psychosis Functioning”; higher values represent better outcomes. The difference in percentages between Post-Psychosis and Pre-Psychosis Functioning was defined as “Post-Psychosis Decline”; higher values represent less decline, whereas lower values represent greater decline.

2.6. Cognitive measures

Premorbid intellectual functioning was estimated with the Wide Range Achievement Test III (WRAT-III) reading subtest (Wilkinson, 1993). Current cognitive functioning was measured with the MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein et al., 2008), which includes the following domains: 1) speed of processing (Symbol Coding, Animal Naming, Trail Making Test, Part A); 2) attention/vigilance (Continuous Performance Test-Identical Pairs); 3) working memory (Spatial

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