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# Do better communication skills promote sheltered employment in schizophrenia?

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#### ABSTRACT

Alongside various psychopathological symptoms and neurocognitive dysfunctions, communication skill impairments may be considered core feature of schizophrenia. Although many studies examined the relation between employment status and neurocognition in schizophrenia, we still know very little about the role of communication skills in vocational status among people with schizophrenia. The purpose of this study is to identify the most characteristic communication, neurocognitive and social cognition differences which separate the employed schizophrenia outpatients from those who do not work. The study included three groups: 33 schizophrenia outpatients employed in social firms, 29 unemployed schizophrenia outpatients participating in occupational therapy and sex & age matched 31 healthy controls. We assessed communication skills, global cognitive functioning, executive functions, memory, social cognition as well as severity of psychopathology. Our results indicate that the most characteristic differences between employed and unemployed schizophrenia outpatients are associated with selective language and communication skills, i.e. paralinguistic aspects of communication, understanding of discrete meaning of linguistic context and figurative meaning of language. We find no significant differences between both clinical groups with regard to neurocognition and social cognition. Moreover, unemployed group had more severe psychopathology than the employed group, so we re-analyzed results controlling for symptom severity. The only differences that endured were related to general communication skills and explanation of pictured metaphors, but only when controlling solely for positive or negative syndrome. In conclusion, the present study indicates that employment in schizophrenia is associated with better symptomatic remission and communication skills, but not with better neurocognition and social cognition.

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#### 1. Introduction

Neurocognitive deficits, alongside clinical symptoms, influence social functioning of people with schizophrenia and have a powerful impact on quality of life (Bora and Murray, 2014; Cichocki et al., 2015; Wible, 2012). The most characteristic cognitive impairments in schizophrenia are essentially associated with processing speed, vigilance/attention, verbal/visual learning, working memory, executive functions, reasoning/problem solving and social cognition (Barlati et al., 2013; Green et al.,

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2015; Lesh et al., 2011; Lewis, 2012). Occurrence of the cognitive deficits was observed before the onset of psychosis and/or despite significant reduction of positive symptoms (Bora and Murray, 2014; Nielsen, 2011; Nuechterlein et al., 2014a). At the same time, negative symptoms seem to be related to impairments in verbal fluency, problem solving, inference, information processing and attention (Hanuszkiewicz et al., 2007; Nielsen, 2011). Similarly, some authors indicate that social skills deficiencies in schizophrenia seem to be semi-independent from psychopathological symptoms (e.g. weak correlations with positive and negative symptoms and occurrence of the social competence deficits in the absence of negative symptoms), however, more severe negative symptoms were related to worse social skills and social functioning (e.g. work adjustment) (Bellack et al., 1990).

Apart from the findings on neurocognitive deficits in schizophrenia, some investigators suggest that communication skills play a pivotal role in good social interactions, so their impairment can be considered a core feature of schizophrenia (Bowie and Harvey, 2008; Kuperberg and

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Caplan, 2003). Consequently, schizophrenia can be regarded as communication disorder (Niznikiewicz et al., 2013; Wible, 2012). People with schizophrenia exhibit deficits in language production and comprehension (Kim et al., 2015). They rarely initiate spontaneous conversation and their statements have less content, often being inadequate in a given social context, with loose associations confusing the listener (Caplan, 1994). People with schizophrenia exhibit impairments connected with perception, comprehension and use of figurative meaning of language, e.g. humor (Bozikas et al., 2007; Corcoran et al., 1997; Polimeni and Reiss, 2006), metaphor (Kircher et al., 2007; Mashal et al., 2014; Mossaheb et al., 2014) sarcasm or irony (Rapp et al., 2013, 2014).

Since the antipsychotic treatment alone does not improve cognitive functions (Nielsen, 2011; Opler et al., 2014) and social cognition (Kucharska-Pietura and Mortimer, 2013), non-pharmacological methods, such as cognitive remediation or meta-cognitive trainings, play an important role in rehabilitation (Gaweda et al., 2009a, 2009b; Keefe et al., 2016; Medalia and Choi, 2009). Similarly, psycho-social rehabilitation and community treatment seem to facilitate the process of recovery (Cechnicki, 2011; Cechnicki and Bielańska, 2008). Importantly, appropriate social support (e.g. sheltered employment) and professional activity of people with schizophrenia have been associated with improvement in the quality of life and daily functioning (Charzyńska et al., 2015) and with reduction of negative symptoms (McGurk and Meltzer, 2000; McGurk and Mueser, 2004). This is important, since elevation of negative symptoms was reported as a factor negatively influencing social skills (e.g. work adjustment) (Bellack et al., 1990). Finally, social support was found to be one's of the most prominent vocational outcome predictors, next to cognitive functioning, social skills and negative symptoms (Tsang et al., 2010b). Despite the existence of many studies examining the relationship between employment and non-social cognition (e.g. attention, executive functions, verbal memory) (Evans et al., 2004; Lystad et al., 2016; McGurk and Meltzer, 2000; McGurk and Mueser, 2004; Midin et al., 2011) or the improvement in neurocognitive functioning (Bell et al., 2008; Bio and Gattaz, 2011; Greig et al., 2007; but see: Tandberg et al., 2012, 2013), we still know very little about the role of specific language and communication skills in employment in schizophrenia. However, some evidence indicates that social cognition has greater impact on vocational functioning than non-social cognition does, although they are highly interrelated (Vauth et al., 2004), and communication skills may predict vocational outcome independently of cognitive performance (Dickinson et al., 2007).

The purpose of this study is to identify the most characteristic communication, neurocognitive and social cognition differences which separate the employed schizophrenia outpatients from those who do not work. In order to attain this goal we measured communication skills, global cognitive functioning, executive functioning, declarative memory and social-cognition. Since previous studies indicate that symptom severity is an important factor which may moderate the relationship between vocational status and cognition, thus we controlled the psychopathology in the analyses.

#### 2. Methods

#### 2.1. Subjects

All of the subjects gave their informed consent to participate and were tested individually by psychologists (neuropsychological assessments) and psychiatrists (clinical interview). Procedures were designed in accordance with the ethical standards of the World Medical Association Declaration of Helsinki (2013) and approved by the Bioethical Committee of Collegium Medicum at the Jagiellonian University in Krakow.

The study included three groups: 33 clinical subjects which were employees of two social firms based in Kraków, Poland: 'U Pana Cogito' hotel and 'Laboratorium Cogito' catering (VOC), 29 clinical subjects which were participants of Occupational Therapy Workshops (OTW) based in Krakow, Poland: 'Miodowa' and 'Czarnowiejska' (OCC) and 31 healthy controls (CON).

The VOC subjects were recruited from local social firms offering sheltered employment to people with mental illnesses. The jobs they do include keeping order in hotel rooms, restaurant, around objects (maid, cleaner, gardener), cooking and serving dishes (cook, waiter, kitchen help), and maintaining direct contact with clients (receptionist). The eligibility criteria for employment with the social firms include: a certificate of severe or moderate mental disability, stable health condition (symptomatic remission) and a sufficient level of key social competences (e.g. ability to cooperate with others). What is crucial, the candidate must be self-motivated to undertake employment. The candidates are mainly recruited from among occupational therapy participants, in which case OTW Program Council assesses which participants fit job requirements and can be presented as candidates for a job to the social firm management. However, potential employees may also be directly referred by psychiatrists who provide ambulatory care to such individuals, or even apply for a job on their own. If the management of a social firm accepts a candidate, they firstly participate in an on-the-job training, lasting from a week to several months, depending on their experience. During the training period the individual learns the job and can be adequately assessed whether they are eligible for the position in terms of professional and social skills and eventually employed. The employees are remunerated for their work in accordance with current legal regulations (i.e. contract of employment). Except from standard training (i.e. trial period) no additional vocational training was provided.

The OCC subjects were recruited from OTW which are offered to people suffering from mental illnesses whose mental condition and lacking professional and social competences do not allow to undertake even sheltered jobs. Often, future participants are referred to OTW by therapists after treatment at day care wards, in order to provide further rehabilitation including various kinds of basic professional skills such as: fine arts, handicraft, tailoring, carpentry, cooking, office work, computer operation.

The criterion of selecting outpatients to vocational or occupational group consisted in either being employed throughout the last year constantly or being unemployed and participating in occupational therapy.

None of the participants had a history of head injuries, seizures, substance dependence or any serious, current somatic illnesses. All were native Polish speakers. Demographic data are presented in Table 1.

The clinical groups consisted of people diagnosed with ICD-10 schizophrenia (World Health Organization, 2011), who were users of a complex treatment and rehabilitation programme. This programme is based on a psychotherapeutic approach implemented in a local community context, carried out within a network of institutions and providing continuity of care and employment in Krakow (Cechnicki, 2011; Cechnicki and Bielańska, 2008). Diagnoses were made based on clinical interview and medical documentation by experienced psychiatrists. The severity of psychopathological symptoms was assessed with Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987). The five dimensions including positive, negative, disorganization, excitement and emotional distress were calculated based on results presented in a meta-analysis by van der Gaag et al. (2006). Only the items which proved significant in all factor analyses were included in each syndrome calculation.

The groups did not differ in terms of sex distribution, age, but a significant difference was found in years of education (i.e. VOC group had significantly fewer years of education than CON group). Both clinical groups did not differ in duration of illness, number of relapses, hospitalization, type and mean dose of antipsychotics calculated as chlorpromazine equivalents (according to: Atkins et al., 1997; Gardner et al., 2010; Woods, 2003), but we found that OCC group had significantly more severe psychopathological symptoms than VOC group as assessed with PANSS scores for total, positive, negative and disorganization symptoms.

#### 2.2. Tests and materials

#### 2.2.1. Right Hemisphere Language Battery (RHLB)

The Polish adaptation (RHLB-PL; Łojek, 2007) of the Right Hemisphere Language Battery (RHLB; Bryan, 1995) was used to evaluate

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