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# A comparison of capacities for social cognition and metacognition in first episode and prolonged depression



Nicolai Ladegaard<sup>a,\*</sup>, Paul H. Lysaker<sup>b,c</sup>, Erik R. Larsen<sup>a</sup>, Poul Videbech<sup>d</sup>

<sup>a</sup> Department of Affective Disorders, Q, Mood Disorders Research Unit, Risskov, Denmark

<sup>b</sup> Indiana University School of Medicine, Department of Psychiatry, Indianapolis, IN, USA

<sup>c</sup> Roudebush VA Medical Center, Indianapolis, IN, USA

<sup>d</sup> Center for Psychiatric Research, Aarhus University Hospital, Risskov, Denmark

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## ABSTRACT

There is a growing awareness that social cognition is a valuable construct for understanding the psycho-social disabilities in depressive illness. Numerous studies have linked affective disorders to impairments in social cognition and specifically the processing of discrete emotional stimuli. Only few studies have investigated the relation between the burden of depressive illness and social cognitive ability. To study these issues, we compared a group of first-episode depressed patients with a group of chronically depressed patients (duration > 2 years) on a broad array of higher-order social cognitive measures including the metacognition assessment scale abbreviated. Contrary to prediction, deficits in social cognition were roughly equivalent between the two groups and there was no significant link between symptom severity and social cognitive ability. Having moderate to severe major depressive disorder (MDD) could be sufficient to predict the presence of deficits in social cognitive ability.

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## 1. Introduction

Major depressive disorder (MDD) is a serious and common mental disorder that profoundly affects an individual's quality of life. Depression is the most prevalent psychiatric disorder in the western world (Kessler et al., 2011) and is estimated to have a point prevalence of around 4% in the Danish population (Olsen et al., 2004). A central trait of MDD is a marked impairment in social functioning (Joiner and Coyne, 1999; Segrin, 2010). Depressed individuals lead less active and satisfying social lives than never depressed persons and frequently report difficulties in their relationships with their spouse, children, and friends (Hirschfeld et al., 2000).

There is a growing interest in the possibility that deficits in social cognition may be a contributory factor to the psycho-social disabilities so common in MDD. Social cognition is a multifaceted construct concerned with the cognitive processes required by people to come to know themselves and understand other people's

behavioral intentions (Fiske and Taylor, 1991; Ochsner, 2008). It is meaningful to place social cognitive capacities along a continuum of increasing complexity and synthesis (Adolphs, 2001; Adolphs, 2010). Lower-order social cognitive ability encompasses the ability to identify and categorize and manifest affective stimuli, e.g. facial display of basic emotions, biological motion and speech prosody. Processing at this level is characterized by being fast, implicit and domain specific. At an intermediate level, the abilities are to make inferences about the mental states of conspecifics including their beliefs, desires and intentions, commonly known as theory of mind (ToM) and perspective taking (Premack, 1978; Brüne, 2003). There are numerous tests developed to access different levels of ToM; one is the Sally–Anne test which taps ToM by assessing the ability to attribute false beliefs to others (Wimmer and Perner, 1983). Also present at this level is social perception which draws on multiple abilities including emotional social perception decoding, ToM, and social knowledge in the form of identifying social and societal rules (Lipton and Nowicki, 2009). Social perceptual tests put demand on subjects to make inferences about complex or ambiguous social situations. Recently, video-based tests have been introduced (Dziobek et al., 2006) encompassing ToM-tasks into a social perceptual paradigm putting real-time demand on subjects to infer

\* Correspondence to: Nicolai Ladegaard, Dept. of Affective Disorders, Q, Mood Disorders Research Unit, Risskov, Denmark, Skovagervej 2, 8240 Risskov, Denmark. Tel.: +45 78472206.

E-mail address: [nicolai.ladegaard@ps.rm.dk](mailto:nicolai.ladegaard@ps.rm.dk) (N. Ladegaard).

meaning from the multimodal behavior of others (e.g. facial display of basic emotions or speech prosody) (Lipton and Nowicki, 2009). Finally, higher-order social cognition captures the ability to reflect and reason about the mental and affective states of oneself and others, moreover, utilizing such understanding to solve problems and master subjective suffering (Semerari et al., 2003; Dimaggio and Lysaker, 2010). This level is often referred to as mentalization (Choi-Kain and Gunderson, 2008) or metacognition (Dimaggio et al., 2009), which compared to lower-order abilities is a more controlled, creative and imaginative process rendering it more sensitive to contextual influences. Metacognition is usually accessed via the coding of a person's discourse when thinking and relating to others events and experiences which are personally relevant.

Research has suggested that depressed patients are burdened with social cognitive impairment in the areas of ToM (Inoue et al., 2004; Zobel et al., 2010; Cusi et al., 2012) and in the decoding of affective stimuli (e.g. identifying emotions displayed by faces) (Leppänen, 2006; Stuhmann et al., 2011). In case of the latter, mood congruent biases have consistently been documented. Only few studies have investigated higher-order social cognition in MDD. Recently, we documented metacognitive impairments in first-episode depressed patients as assessed by the Abbreviated Metacognitive Assessment Scale (Semerari et al., 2003). Our results were in line with Fischer-Kern et al. (2013) who utilizing the Reflective Functioning Scale (Fonagy et al., 1998) found female depressed patients to be impaired in their mentalizing capacity. The reflective functioning scale is an instrument developed to assess individual differences in the ability to mentalize attachment relationships. Conversely, in an earlier study by Taubner et al., 2011, no difference was documented between chronic depressed patients and their matched healthy controls using the same assessment methods as Fischer-Kern et al. (2013). Notably, in a single case study, Carcione et al. (2008) documented how the metacognitive capabilities, operationalized by the Metacognitive Assessment Scale (MAS), of a young depressed woman improved parallel to the time she began to recover from her depression.

Overall, evidence suggests that MDD is associated with wide-ranging impairments in social cognition in the acute state. Less is known about the developmental trajectory of social cognitive capacities or the association between symptom severity and social cognitive ability in the case of MDD. For instance, is impairment present in both the early and the later phases of illness? Does social cognitive ability deteriorate beyond the initial impact of the illness or not? One possible mechanism of change could be that longer duration of depression and the subsequent social disengagement may lead to an atrophy of the metacognitive system. Another possibility is that poorer social cognitive skills may be a liability that increase the risk of more severe depression or even certain types of depression.

A few studies have targeted chronic depression with an idea that this subgroup would perform particularly below the norm (Wilbertz et al., 2010; Zobel et al., 2010; Taubner et al., 2011), they have however used healthy controls as reference group, whereby not allowing them to inquire specifically into the implications of prolonged or multiple exposure to MDD. In a notable exception, van Randenborgh et al. (2012) compared chronically the episodic depressed patients on ToM and alexithymia, the latter designating the inability to identify and describe personal emotions. The research group reported higher scores on alexithymia in the chronically depressed group, while no group differences were found in the domain of ToM.

Understanding how the burden of depressive illness is related to social cognition has important clinical implications for both intervention and treatment. To explore these issues, we compared a group of first-episode depressed patients with a group of chronically depressed patients (duration >2 years) on a broad

array of intermediate and higher-order social cognitive measures including ToM and metacognition. We expected to find chronically depressed patients less able than first-episode depressed patients in their social cognitive ability as a consequence of their longer exposure to depression. Also, we expected to find a link between increasing symptom severity and social cognitive impairment as documented in much non-social cognitive research (McDermott and Ebmeier, 2009).

## 2. Methods

### 2.1. Participants and procedure

Twenty-seven chronically depressed patients and 44 first-episode depressed patients were included in the study. The chronically depressed participants were in- and outpatients recruited from the Mood Disorders Units at Aarhus University Hospital, Risskov. Inclusion criteria were major depressive episodes of chronic type as specified in the DSM-IV (American Psychiatric Association, 1994). This meant that patients had to meet full criteria for MDD continuously over a period of minimum 2 years (Klein, 2010). In addition, to be included in the study, chronic depressed patients had to have failed to respond to two or more trials of different antidepressant classes; often referred to as treatment resistant depression (TRD) (Souery et al., 2006). The criteria of treatment resistance were chosen to exclude patients who fulfilled the criteria for chronic depression but who had never been adequately treated with psychotropics. First-episode depressed patients were required to fulfill DSM-IV criteria and were recruited from general practitioners in the Central Denmark Region. All first-episode depressed participants were psychotropic drug-naïve. Both groups had to have depression as their primary diagnosis and symptom severity of moderate to severe MDD (HamD17 > 17). Furthermore, substance use disorder, neurological illness, head trauma and chronic somatic disease led to exclusion for both groups.

All participants were assessed at the University Hospital Aarhus, Risskov by a trained psychologist. Confirmatory MDD diagnosis and symptom severity were obtained through an independent psychiatrist at the time of inclusion. Test duration was approximately 2 h. The study was approved by the local scientific ethics committee (id.: 20100161) and the Data Protection Agency. All participants gave informed, voluntary, and written consent.

### 2.2. Measures

#### 2.2.1. Psychiatric assessment

The Mini International Neuropsychiatric Interview (MINI) was used to access Axis I diagnoses (Sheehan et al., 1998). Personality disorders were accessed by utilizing the structured clinical interview for DSM-III-R personality disorders (SCID-II) (Spitzer et al., 1990). Severity of depression and anxiety was assessed using the 17-item Hamilton Depression Rating Scale (HamD-17) (Hamilton, 1967) and The Beck Anxiety Inventory (BAI) (Beck et al., 1988). As noted, MDD symptom severity was accessed by two independent health professionals, a psychiatrist and a psychologist with an extensive experience. Interclass correlation coefficient revealed good reliability on the HamD-17 ( $p=0.71$ ).

#### 2.2.2. Social cognition

The Frith-Happé animations (FHA) (Abell et al., 2000) are animations depicting moving shapes; a red and a blue triangle in a contained space. Half the animations are scripted to evoke mental state attribution by their kinetic properties (ToM animations). The ToM animations depict a distinct story (e.g. "the small triangle mimicking the big triangle and being told off for it"). The other half of the clips were designed to give the impression of random movements with no overarching storyline (random animations). After viewing each clip, subjects were asked to describe what was happening in the animation. The test can be characterized as an on-line ToM task targeting mental state attribution. The verbal description given after each clip was transcribed for later coding along with one primary dimension – 'intentionality'. The intentionality score sought to capture the degree of appreciation of mental states. The variable had a range from 0 (nondeliberate action) to 5 (deliberate action with the goal of affecting others mental state). A higher score represents a higher capacity. For a comprehensive description of scoring rules see Castelli et al. (2000) and Russell et al. (2006). Inter-rater reliability was assessed with one blind rater revealing fair reliability ( $p=0.41$ ).

The Awareness of Social Inference Test (TASIT – Minimal subtest-part 2 A – Danish version) (McDonald et al., 2003) was used to assess social perception and specifically subjects' ability to interpret naturalistic social interactions. The test

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