



# Metacognitive and social cognition training (MSCT) in schizophrenia: A preliminary efficacy study



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## ARTICLE INFO

### Article history:

Received 3 April 2013

Received in revised form 16 July 2013

Accepted 30 July 2013

Available online 17 August 2013

### Keywords:

Schizophrenia  
Social cognition  
Rehabilitation  
Cognitive bias  
Metacognition

## ABSTRACT

Psychosocial interventions have proven to be effective in treating social cognition in people with psychotic disorders. The current study aimed to determine the effects of a metacognitive and social cognition training (MSCT) program, designed to both remediate deficits and correct biases in social cognition. Thirty-five clinically stable outpatients were recruited and assigned to the MSCT program ( $n = 19$ ) for 10 weeks (18 sessions) or to the TAU group ( $n = 16$ ), and they all completed pre- and post-treatment assessments of social cognition, cognitive biases, functioning and symptoms. The MSCT group demonstrated a significant improvement in theory of mind, social perception, emotion recognition and social functioning. Additionally, the tendency to jump to conclusions was significantly reduced among the MSCT group after training. There were no differential benefits regarding clinical symptoms except for one trend group effect for general psychopathology. The results support the efficacy of the MSCT format, but further development of the training program is required to increase the benefits related to attributional style.

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## 1. Introduction

Impairments in social cognition are a consistent finding among patients with schizophrenia. These can be conceptualized both as deficits and as biases. Most deficits are found in theory of mind, emotion recognition and social perception (Green et al., 2005, 2008), while biases include a broad array of cognitive distortions such as attributional and jumping to conclusion biases that lead to failures in data acquisition and attribution of causes. These biases appear to be related to the formation and maintenance of symptoms that are characteristic of schizophrenia, particularly delusions (Garety and Freeman, 1999; Freeman, 2007; Moritz and Woodward, 2007).

Social cognitive processes are unique determinants of functional outcomes in schizophrenia (Couture et al., 2006). These processes can assume one of two roles. First, there is growing evidence that social cognition is a direct predictor of functional outcomes and that it determines community functioning to a greater extent than does neurocognition (Fett et al., 2011). Second, social cognition has been found to mediate the relationship between basic neurocognition and functional outcome, thereby making it more proximal to daily life functioning (Vauth et al., 2004; Sergi et al., 2007; Couture et al., 2011). Accordingly, social cognition should be considered an important target for intervention.

Several psychosocial interventions have been developed to overcome and correct the social cognitive features of schizophrenia. Most of these treatment programs were designed to directly address deficits in social cognition (e.g., emotion recognition, theory of mind) using remediation methods, while debiasing approaches are rarely employed when the primary focus is social cognitive processes (e.g., Hogarty et al., 2004; Roncone et al., 2004; Silver et al., 2004; Wolwer et al., 2005; Choi and Kwon, 2006; Kayser et al., 2006; Russell et al., 2006; Marsh et al., 2010; Mazza et al., 2010). However, deficits and biases affecting social cognition occur together in schizophrenia, and thus potentiate each other. For that reason, we hypothesize that the integration of approaches designed to target deficits and to provide corrective experiences may be most advantageous not only for biases but for the amelioration of symptoms of psychosis as well.

Thus, the aim of this study was to determine the effects of a metacognitive and social cognition training (MSCT) program designed to both remediate deficits and to correct biases in social cognition. The MSCT may be regarded as a hybrid of two well-known treatment formats: social cognition programs (e.g., social cognition and interaction training; social cognitive skills training) (Penn et al., 2007; Horan et al., 2009; Roberts and Penn, 2009) and metacognitive training for schizophrenia (Moritz et al., 2010b). While both treatment formats address similar skills, they apply different approaches. Social cognition programs usually make use of direct training of social cognitive processes such as emotion perception, attributional bias and theory of mind, while metacognitive training aims to raise the patient's awareness of the presence and dysfunctionality of cognitive distortions and providing corrective experiences. For example, while social cognition

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programs offer training strategies to help in the identification of basic emotions, metacognitive training focuses on the susceptibility to misinterpret and make false assumptions based on facial expressions when contextual information is scarce. Furthermore, the outcomes for both programs differ. While social cognition programs tend to emphasize improvement on social cognitive tests (e.g., Combs et al., 2007a), metacognitive training usually demonstrates the potential to reduce symptoms (particularly delusions) and biases (e.g., Moritz et al., 2011a).

To our knowledge, these different yet complementary approaches were never used in combination. We compared MSCT plus treatment-as-usual (TAU) to TAU among outpatients with schizophrenia in a quasi-experimental trial to evaluate whether this intervention package results in improvements in social cognition and functioning and in a reduction in symptoms.

## 2. Materials and methods

### 2.1. Participants

Participants were recruited from three socio-occupational centers (*forums sócio-ocupacionais*) that provide services to individuals with stable, severe and persistent mental illnesses. The centers were located in the districts of Porto (AFUA and ANARP) and Aveiro (Casa Ozanam), Portugal. Patients were included if they had a diagnosis of schizophrenia based on the DSM-IV criteria as determined by the patient's psychiatrist, were aged between 20 and 55 years, and were clinically stable without significant changes in medication for at least one month. The patients with diagnoses of neurologic disorders or with current substance dependence were excluded from the study.

This study was approved by the Scientific Committee of the Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto and by the directive board of the AFUA, ANARP and Casa Ozanam. All participants gave written informed consent, and there was no financial compensation for participation.

Thirty-five clinically stable outpatients were recruited and assigned to either the MSCT program ( $n = 19$ ; three females) or to the treatment-as-usual (TAU;  $n = 16$ ; one female) group. Participants were assigned to the TAU group if they met study criteria, declined to participate in the MSCT program or were unable to attend to the sessions. Participants from the MSCT group attended at least 80% of the program sessions. No differences were found between groups regarding socio-demographic or clinical characteristics (Table 1).

**Table 1**  
Summary of participant characteristics and baseline performance.

Characteristics	MSCT ( $n = 19$ ) M (S.D.)	TAU ( $n = 16$ ) M (S.D.)	$p$
Gender (F/M)	3/16	1/15	.61 <sup>a</sup>
Age (years)	38.63 (8.88)	35.94 (8.69)	.37 <sup>b</sup>
Educational level			
<9 years	6	9	.21 <sup>c</sup>
9–12 years	10	7	
Higher education	3	0	
Marital status			
Married	2	0	.62 <sup>c</sup>
Single	14	15	
Divorced/separated	2	1	
Deceased spouse	1	0	
Length of illness (years)	13.68 (7.49)	13.63(8.97)	.98 <sup>b</sup>
Chlorpromazine equivalent dose (mg/day)	406.98 (225.45)	432.79 (322.89)	.78 <sup>b</sup>

<sup>a</sup> Fisher's exact test.

<sup>b</sup> Two-tailed student t-test.

<sup>c</sup> Chi-square test (exact Monte-Carlo estimations for small samples).

### 2.2. Instruments

Participants of both groups (MSCT and TAU) were evaluated twice, once before and once after training (up to two weeks after training). The test battery consisted of social cognitive and cognitive biases as well as clinical and functional scales.

#### 2.2.1. Social cognition and cognitive biases

*Emotion recognition* was measured using the Facial Emotion Identification Test (FEIT; Kerr and Neale, 1993), which includes 19 pictured faces displaying basic emotions that the participant must correctly identify. Total scores range from 0 to 19.

*Emotion regulation* was measured using the managing emotions section of the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT-ME; Mayer et al., 2002), which has been recommended by the NIMH initiative titled Measurement and Treatment Research to Improve Cognition in Schizophrenia (Nuechterlein and Green, 2006). Participants are required to judge the efficacy of different responses for achieving goals or for maintaining or regulating emotions in different situations. A total score was derived using the MSCEIT general consensus method.

*Theory of mind* was measured using the hinting task (Corcoran et al., 1995), which consists of ten written vignettes, each of which presents an interaction between two characters and ends with one of the characters uttering a hint. The participant's task is to determine what the character really meant when he/she said this. Total scores range from 0 to 20.

*Attributional style* was assessed using the Ambiguous Intentions Hostility Questionnaire – ambiguous situations (AIHQ-A; Combs et al., 2007b). Participants read five short second-person vignettes describing ambiguous social situations and then answer questions about the intentions of the characters and how the subjects themselves would respond to the situation. The AIHQ provides hostility and aggression bias scores, along with a composite blame score (average of intentionality, anger, and blame item ratings).

*Social perception* was measured using the *Social Perception Scale* (SPS; García et al., 2003). This measure consists of four photographs that are presented one at a time to the participant. The participants are then asked to carefully look at the picture for 2 min. Following the methods of other studies using the SPS (e.g., Combs et al., 2007a), performance is indexed as the total number of accurate details identified in the picture.

*Jumping to conclusion* (JTC) bias was measured using the fish task (Moritz et al., 2010a; Speechley et al., 2010). Participants were shown two lakes with two different colors of fish in opposite ratios (80% and 20%). Participants were told that fish would be caught one-by-one from only one of the two lakes. The participants were then instructed to decide from which of the two lakes the fish were caught. Draws to decision (DTD) correspond to the number of fish a participant required before deciding and JTC was operationalized in this study as making a decision after the first fish. For the post-assessment, a second version with different colors but the same ratios was used.

The *Trail Making Test B* (TMT-B; Reitan, 1992; Reitan and Wolfson, 1995) was also included to attend to changes in cognitive flexibility during the MSCT program. In this task, participants must switch between the numerical mode and the alphabetic mode by connecting 26 numbers and characters. The score is the total time needed to finish the task. To keep the assessment schedule brief, we did not include any additional neurocognitive testing.

#### 2.2.2. Functional outcome and clinical

Functioning was determined using the life skills profile (LSP; Rosen et al., 1989). The LSP includes 39 items divided into five subscales: self-care, non-turbulence, social contact, communication and responsibility. The severity of schizophrenia-related symptoms was assessed using the *Positive and Negative Syndrome Scale* (PANSS; Kay et al., 1987).

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