



Validation of Social Cognition Rating Tools in Indian Setting (SOCRATIS): A new test-battery to assess social cognition

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ABSTRACT

Social cognition is a cognitive domain that is under substantial cultural influence. There are no culturally appropriate standardized tools in India to comprehensively test social cognition. This study describes validation of tools for three social cognition constructs: theory of mind, social perception and attributional bias. Theory of mind tests included adaptations of, (a) two first order tasks [Sally–Anne and Smarties task], (b) two second order tasks [Ice cream van and Missing cookies story], (c) two metaphor-irony tasks and (d) the faux pas recognition test. Internal, Personal, and Situational Attributions Questionnaire (IPSAQ) and Social Cue Recognition Test were adapted to assess attributional bias and social perception, respectively. These tests were first modified to suit the Indian cultural context without changing the constructs to be tested. A panel of experts then rated the tests on likert scales as to (1) whether the modified tasks tested the same construct as in the original and (2) whether they were culturally appropriate. The modified tests were then administered to groups of actively symptomatic and remitted schizophrenia patients as well as healthy comparison subjects. All tests of the Social Cognition Rating Tools in Indian Setting had good content validity and known groups validity. In addition, the social cue recognition test in Indian setting had good internal consistency and concurrent validity.

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1. Introduction

Research on social cognition in schizophrenia is an emerging field. It brings with it tremendous clinical and research potential which is yet untapped. Two most important facets of social cognition research are (a) its role in the growing understanding of the social brain neurobiology (Penn et al., 2006) and (b) its role as a determinant of functional outcome in schizophrenia (Green et al., 2005; Penn et al., 2006). The importance of social cognition is evident by the steep rise in studies on this subject over the recent years. The term ‘social cognition’ is not yet recognized as a Medical Subject Heading (MeSH) in the index medicus. However, the results of literature search looking for the term ‘social-cognition’ in either the titles or the abstracts of the citations indexed in the PubMed show a steep increase in publications from just 24 in the year 2000 to 221 in the year 2010. Despite its popularity, there are important methodological concerns about studying social cognition in schizophrenia—poor knowledge about the psychometric

properties of the tests used to measure social cognition is an important concern (Green et al., 2008).

Researchers have identified four sub-domains of social cognition for further research in schizophrenia: emotion processing, theory of mind (ToM), social perception and knowledge, and attributional bias (Green et al., 2005, 2008). Several tools to assess these domains have been described in the literature. Most of these have been developed in the western cultural context. A critical aspect regarding their validity is the influence of socio-cultural factors on social cognition processing.

Social cognition is a cognitive domain that is under substantial cultural influence. The interplay between culture and social cognition is determined by the degree of cultural influences on cognitions, the processes that focus on self-other-construct and the levels of processing (Vogele and Roepstorff, 2009). Despite there being a synchrony in the age at onset of social cognition abilities across cultures, there is influence of culturally specific principles of the causes of human action and thought on these cognitive processes (Avis and Harris, 1991; Green et al., 2008; Lillard, 1998). Individual cultural schemata and interpersonally shared cultural models determine how humans interpret each other's experiences and guide their actions (D'Andrade, 1995; Shore, 1996). A meta-

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Table 1

Average scores (1 = strongly disagree; 5 = strongly agree) by 18 expert consultants on content validity and cultural sensitivity of the modified tasks.

Tasks	Average content validity scores	Average cultural sensitivity scores
Theory of mind		
Shanthi–Ravi task	4.44	4.44
Sweet box task	4.44	4.22
Ice-cream man task	3.89	4
Hidden-bananas task	3.78	4
Metaphor–Irony		
Story 1	3.56	3.78
Story 2 ^a	3.22	3.44
Story 3	4.11	4.44
Faux pas recognition test		
Faux pas 1	4.5	4.5
Faux pas 2	4.38	4
Faux pas 3	4.75	4.5
Faux pas 4	4.38	4.25
Faux pas 5	4.5	4.38
Control 1	4.75	4.63
Control 2	4.63	4.50
Control 3	4.63	4.63
Control 4	4.75	4.75
Control 5	4.75	4.75
Attributional bias questionnaire	3.67	4
SoCueReTI	4.21	4.36

^a Received a score of <4 from >75% of the experts and hence was excluded from the battery.

analysis of cross-cultural studies on emotion recognition showed that emotions were better recognized by members of the same national, ethnic, or regional group (Elfenbein and Ambady, 2002). Functional magnetic resonance imaging studies demonstrate that neural correlates of theory of mind abilities may differ depending upon cultural background (Kobayashi et al., 2007; Zhu et al., 2007). Clearly, tools to assess social cognition in one culture may not be useful in another culture. Emotion recognition is the only domain of social cognition, which has tools validated in the Indian context (Behere et al., 2008; Mandal, 1987). The aim of this study was to develop and validate the Social Cognition Rating Tools in Indian Setting (SOCRATIS) to test 3 domains of social cognition namely, theory of mind, attributional styles and social perception.

2. Methods

2.1. Task selection

Table 2.1 gives a list of tasks that were selected from the available literature to assess the 3 selected social cognition domains. These domains were selected based on the recommendations of expert consensus workshops on social cognition in schizophrenia (Green et al., 2005, 2008). Brune (2005) has recommended the tests in Table 2.1 for assessing ToM, Internal,

Table 2

Mean rank scores of patients and controls on theory of mind, attributional bias and social perception compared using Mann–Whitney *U*.

Variable	Patients	Controls	Mann–Whitney <i>U</i>	<i>p</i>	Cohen's <i>d</i>
FOT Index ^a	7.5	11.5	22.5	0.029	1.1
SOT Index ^a	5.5	13.5	4.5	0.001	2.3
FPC Index ^a	6	13	9	0.005	1.7
EB ^a	11.72	7.28	20.5	0.07	1.1
PB ^a	8.56	10.44	32	0.44	0.32
SP Index ^b	6.65	14.35	11.5	0.004	1.8
SP Index (HE) ^b	6.55	14.45	10.5	0.003	1.7
SP Index (LE) ^b	7.3	13.7	18	0.015	1.3

FOT: first order ToM; SOT: second order ToM; FP: faux pas composite; EB: externalizing bias; PB: personalizing bias; SP: social perception; HE: high emotion; LE: low emotion.

^a Sample of 9 symptomatic schizophrenia patients [3 females, mean (SD) age of 30 (1.2) years, mean education 9.9 years] and health controls [3 females, mean (SD) age of 29 (1) years, mean education 10.3 years].

^b Sample of 20 remitted schizophrenia patients [7 females, mean (SD) age of 33.8 (12.8) years and mean education of 9.3 years] and healthy controls [5 females, mean (SD) age of 30.9 (9.7) years and mean education of 9.5 years].

Personal and Situational Attributions Questionnaire (IPSAQ) and Social Cue Recognition Test (SCRT) were chosen as tests for the other two domains.

2.2. Task modification

Tasks were modified by UMM, JT, CNK and SPS to make them suitable for application in Indian context. The original constructs of the tasks were kept unmodified. All the tasks were created in both Hindi (national language) and Kannada (state/local language).

2.2.1. Theory of mind (ToM)

ToM tasks that were selected employed picture stories in the form of four to six cartoon sequences. After narration of the stories, the respondents are asked questions which assess their theory of mind abilities and control questions to assess their memory regarding non-ToM facts in the stories. Box 1 illustrates the changes in one of the 2nd order ToM tasks. We modified the characters' names (e.g., Shanti–Ravi instead of Sally–Anne), attire and the background of illustrations to suit the Indian context. Narration of the stories was done in Hindi or Kannada, but the context of narration remained essentially the same.

2.2.2. Attributional styles

The Internal, Personal, and Situational Attributions Questionnaire (IPSAQ) (Kinderman and Bentall, 1996) has 32 hypothetical social situations, which are read out to subjects. The respondents are expected to make causal attributions. These attributions are classified as internal (related to self) and external (personal or

Table 2.1

List of tasks selected for modification and validation in the Indian context.

Domain	Original task	Authors	Modified task
1. ToM			
First order ToM	Sally–Anne task	Wimmer and Perner (1983)	Shanthi–Ravi task
	Smarties task	Perner et al. (1987)	Sweet box task
Second order ToM	Ice-cream van task	Perner and Wimmer (1985)	Ice-cream man task
	Missing-cookies task	Stone et al. (1998)	Hidden-bananas task
Metaphor–Irony	Metaphor–Irony stories	Drury et al. (1998)	Metaphor–Irony stories
Faux pas	Faux pas recognition test	Stone et al. (1998)	Faux pas recognition test
2. Attributional styles	IPSAQ	Kinderman and Bentall (1996)	Attributional bias questionnaire
3. Social perception	SCRT	Corrigan and Green (1993)	SoCueReTI

ToM: theory of mind; IPSAQ: Internal, Personal and Situational Attributions Questionnaire; SCRT: Social Cue Recognition Test; SoCueReTI: Social Cue Recognition Test in Indian Setting.

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