

# Understanding others and being understood in social interactions: the role of theory of mind and clinical symptoms in people with schizophrenia spectrum disorders

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## Introduction

• Individuals with schizophrenia spectrum disorders (SSD) experience impairments in verbal productions (de Sousa et al., 2019; Docherty et al., 1996). Yet, only a limited number of prior studies investigated these deficits using joint tasks performed with a real interaction partner (Achim et al., In press).

• Achim et al. (In press) conducted a study using a joint task based on the referential communication paradigm. The results revealed that individuals with SSD showed significantly lower scores than healthy controls (HC) on the three evaluated discourse parameters; Facility (how easy/hard it was to perform the task with the participant), Interest (how interesting their verbal productions were) and Expressivity (how expressive their voice were).

• The Storytelling in Sequence Task (STST) is a joint task also based on the referential communication paradigm (Fossard et al., 2018) and has never yet been used to study verbal production in SSD.

**Objectives:** A first objective was to determine whether individuals with a SSD also obtain reduced ratings of Facility, Interest and Expressivity, in comparison to a HC group when using the STST, and to examine the effect of story complexity. A second objective was to examine the link between these judgements and clinical symptoms as well as theory of mind performance.

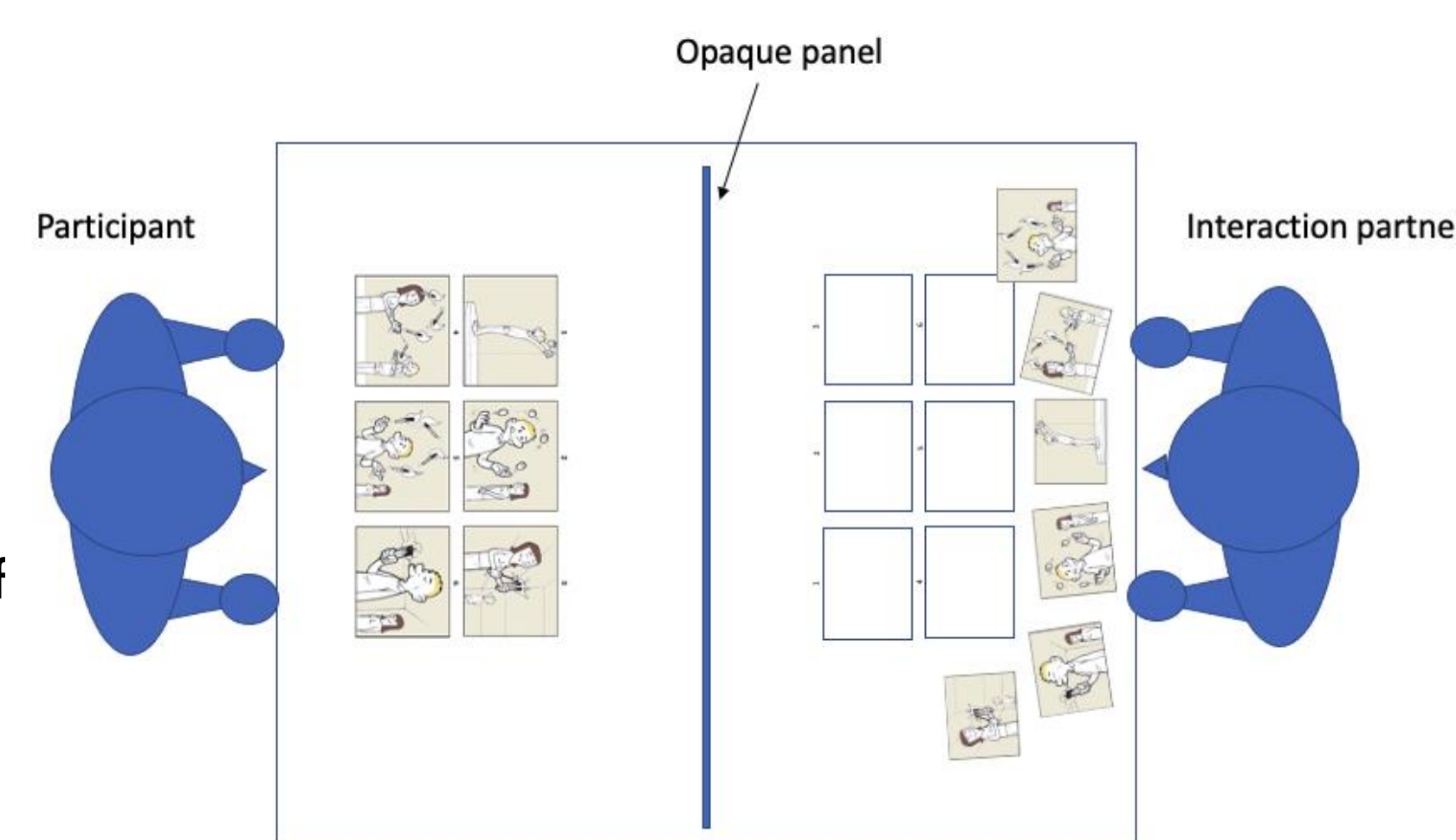
## Methods

### PARTICIPANTS

- 51 outpatients with recent-onset of SSD (schizophrenia N = 28, schizoaffective disorder N = 12, delusional disorder N = 4, psychotic disorder not otherwise specified N = 4, brief psychotic disorder N = 1, schizophreniform disorder N = 2; 37 men, mean age 34.8)
- 68 healthy controls (20 men, mean age 28.3)

### NARRATIVE JOINT TASK

- The Storytelling in Sequence Task (STST) (Fossard et al., 2018)
- The participant has to narrate 9 cartoon stories (i.e., 3 stories per level of complexity)
- The interaction partner (matcher) has to listen and place the images in order and can ask questions if needed.
- Manipulation of the referential complexity
  - Level 1 : A single character
  - Level 2 : Two characters with the same gender
  - Level 3 : Two characters with different gender



- Four research assistants (different from those who administered the STST) each listened to all the narratives (not knowing which ones were from SSD, HC or a control audio track) and were asked to rate on a scale from 1 to 10 the three following aspects:

- How easy/hard it was to place the images in order (Facility ratings).
- How interesting the story was (Interest ratings).
- How expressive was the participant's tone of voice (Expressivity ratings).

### THEORY OF MIND ASSESSMENT

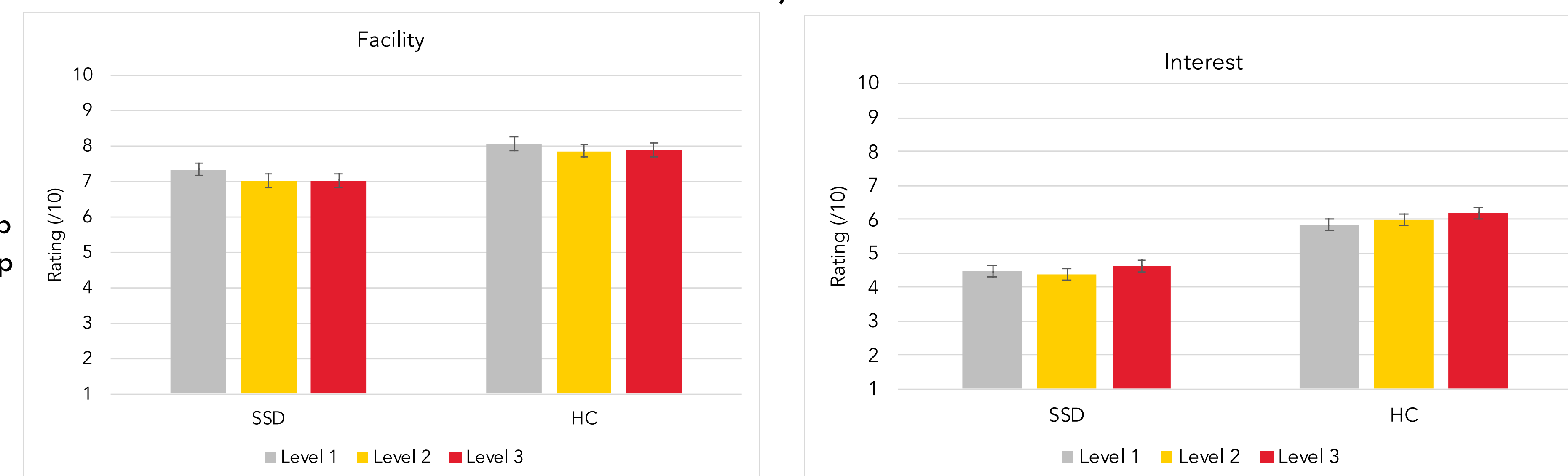
- Theory of mind was assessed with the Combined Stories Task (COST; Achim et al. 2012)

### CLINICAL SYMPTOMS ASSESSMENT

- Positive and Negative Syndrome Scale (PANSS; Kay et al. 1987)

## Results

### Facility, Interest and Expressivity ratings and levels of referential complexity (means and standard error)



#### Facility ratings:

- Main effect of group ( $F(1,115) = 13.02, p < .001$ )

#### Interest ratings:

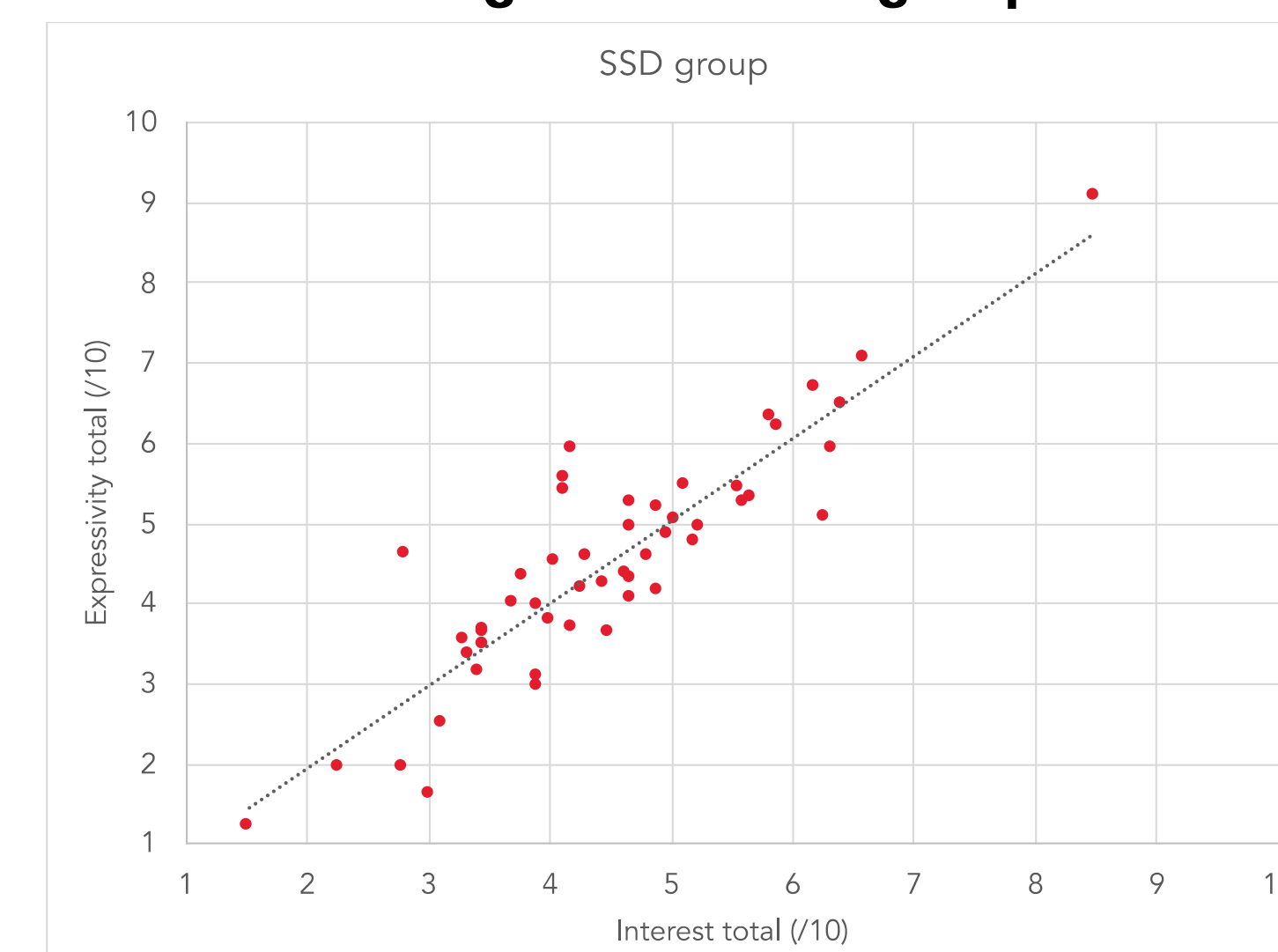
- Main effect of group ( $F(1, 115) = 46.57, p < .001$ )

#### Expressivity ratings:

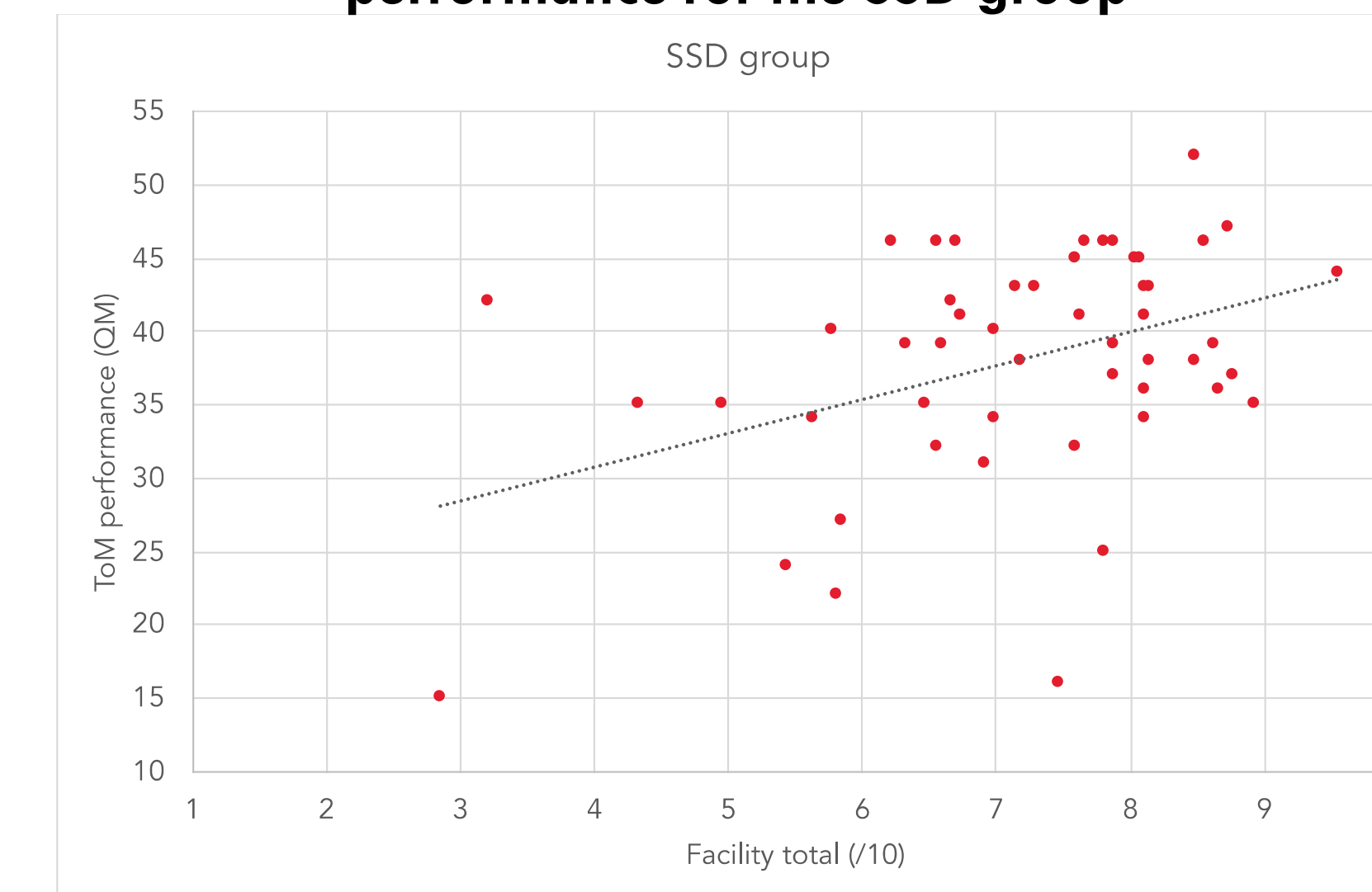
- Main effect of group ( $F(1,115) = 53.41, p < .001$ )
- Main effect of level of complexity ( $F(2, 230) = 5.26, p = .006$ )

Stories with level 2 of referential complexity had significantly lower Expressivity ratings than both level 1 stories and level 3.

### Association between the Interest and Expressivity ratings for the SSD group



### Association between the Facility ratings and ToM performance for the SSD group



### Association between the Facility ratings and ToM performance for the SSD and HC groups

	Facility ratings	Interest ratings	ToM	PANSS positive	PANSS negative	PANSS cog./disorg.	PANSS dep./anxiety	PANSS excit./hostility
SSD group								
Facility ratings			0.41*	-0.34*	-0.45**	-0.61**	-0.15	-0.31*
Interest ratings	0.47**		0.31*	-0.05	-0.58**	-0.27	-0.14	0.02
Expressivity ratings	0.19	0.89**	0.25	-0.03	-0.53**	-0.08	-0.17	0.08
Healthy controls								
Facility ratings			0.23					
Interest ratings	0.37*		0.07					
Expressivity ratings	0.12	0.77**	0.08					

\*  $p < 0.05$ , \*\*  $p < 0.001$

## Conclusion

- The results of the current study replicate and extend those from a previous study by Achim et al. (In press) using a different joint task. Notably, these results include significantly lower score for the three ratings in the SSD group, a moderate association between Facility ratings and ToM performance in the SSD group and a strong association between Interest and Expressivity ratings in both groups.
- This study highlights the importance of expressive symptoms (e.g., blunted affect, alogia) for the interest generated by people with SSD when they interact verbally with another person.
- Finally, the results highlight that people with SSD who experienced ToM difficulties also have more difficulty making themselves understood by others.