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See-know ability and social competence in children with autism

Cognitive Representation, Verbal and Non-verbal Communication Skills, and Social Competence in Children with ASD

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Introduction

• Understanding internal states (e.g., feeling cold, hungry, hurt) and mental states (e.g., seeing leads to knowing) are two basic cognitive representational abilities. Both tap the “mind reading” ability in different ways. However, the literature that aims to investigate the sociocognitive correlates of social competence usually focuses solely on mental-state understanding. Nevertheless, it is plausible that socially competent behaviors such as cooperating and helping necessitate understanding inner states as well as mental states.

• Language is another representational ability that is closely linked with mind reading and social competence.

Aim:

• The main aim of the study was to investigate the role of cognitive representation ability (that includes both understanding mental states and internal states) in social competence of children with Autism Spectrum Disorder (ASD), and to examine if cognitive representational abilities predict social competence over and above verbal and non-verbal communicational skills in children with ASD.

• The secondary aim was to investigate the relative importance of using and understanding verbal and non-verbal language for socially competent behaviors of children with ASD.

Method

Sample: 45 Turkish children (34 male) diagnosed with ASD.

Age range= 3 to 14 years ($M_{age} = 8.5$; $SD = 3.1$)

Measures:

Social competence :

Social Skills Rating System
(Gresham & Elliot, 1990)

Assertiveness
and
Cooperation
(11 items)

$\alpha = .90$

Completed by special education teachers

Verbal and non-verbal communication:

Schedule of Handicaps, Behaviors and Skills
(Wing & Gould, 1979)

- Comprehension of Speech
- Ability to Use Speech
- Comprehension of Non-verbal Communication
- Ability to Use Non-verbal Communication

Completed by special education teachers.

Total scores were calculated by taking the percentage scores from each scale.

Cognitive Representation:

Measure for Understanding Internal States (Lind & Bowler, 2010) :

- 1) Fiona and John* go out to play in the park. Fiona falls over and cuts her knees and John gets muddy knees. Who gets sore knees?
- 2) John does some coloring while Fiona goes for a long run. Who gets tired out?
- 3) It's snowing outside. Fiona goes outside to make a snowman while John stays indoors by the fire and reads a book. Who gets cold?
- 4) John and Fiona are very hungry. Fiona has a small glass of water and John has a big roast dinner. Who gets full up?
- 5) John and Fiona go to the beach. John lies down in the sun while Fiona goes swimming. Who gets hot?
- 6) John and Fiona go to a birthday party. John has one plate of food and Fiona eats all the cakes and ice-cream. Who starts feeling sick?

Internal-state understanding total score = calculated by adding the number of true answers.

Measure for Understanding Mental States (See-Know Ability) (Lind & Bowler, 2010):

5 different opaque boxes containing different toys inside were presented with a female and a male doll. One of the dolls look inside the box to see what it contains, the other doll do not look inside.

Example: “John lifts up the box and Fiona opens the box and has a look. Who knows what’s in the box?”*

Mental State Understanding was measured with 5 such questions.
Mental State Understanding total score= calculated by adding the number of true answers

*The names John and Fiona were replaced by common Turkish names while the stories were told to Turkish children.



Results

• Child's age and sex were not significantly related with any of the developmental outcomes.

Table 1

Descriptive Statistics ($N = 45$)

	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Social Competence (0-4)	2.05	.53	1.18	3.27
Understanding Internal States (0-6)	3.80	2.12	0	6
Understanding Mental States (0-5)	2.88	1.76	0	5
Cognitive Representation Total Score (z)	.00	.88	-1.71	1.12
Comprehension of Speech ^a	71.75	23.05	20	100
Ability to Use Speech ^a	67.92	26.86	0	100
Comprehension of Non-verbal Communication ^a	87.04	20.38	16.17	100
Ability to Use Non-verbal Communication ^a	72.17	23.54	14.29	100

^a indicates that the values are presented in percentages.

When internal state understanding was controlled, the correlation between understanding mental states and social competence was not significant ($r = .27, ns$). Also when mental state understanding was controlled, the correlation between understanding internal states and social competence was non-significant ($r = .18, ns$). **Based on the significant correlation between understanding mental states and internal states, we formed a “composite cognitive representation total score” by taking the average of their standardized (z) scores.**

Table 2

Zero-order Correlations ($N = 45$)

	1	2	3	4	5	6	7
1. Social Competence	-						
2. Understanding Internal States	.34*	-					
3. Understanding Mental States	.39**	.53***	-				
4. Cognitive Representation Total Score	.42**	.88***	.88***	-			
5. Comprehension of Speech	.50***	.61***	.41**	.58***	-		
6. Ability to Use Speech	.48**	.63***	.45**	.61***	.71***	-	
7. Comprehension of Non-verbal Communication	.62***	.51***	.29+	.45**	.71***	.48**	-
8. Ability to Use Non-verbal Communication	.68***	.50***	.35*	.48**	.55***	.54***	.58***

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Backwards Regression Analysis:

• DV: Social competence

• IVs: 1) Cognitive representation total score 2) Comprehension of speech 3) Ability to use speech 4) Comprehension of non-verbal communication 5) Ability to use non-verbal speech

Results: The two significant predictors of social competence in children with ASD were the ability to use non-verbal communication **and** comprehension of non-verbal communication. Cognitive representation ability, comprehension of speech, and the ability to use speech did not significantly predict social competence (see Table 3).

Table 3

Backwards Regression Analysis to Predict Social Competence Skills of Children with ASD ($N = 45$)

Variable	R	Adjusted R ²	B	β
Step 4				
Comprehension of Non-verbal Communication			.009	.34*
Ability to Use Non-verbal Communication	.72	.51	.011	.48**

* $p < .05$, ** $p < .01$

Discussion

• Both understanding mental states and internal states are positively and significantly related to social competence in children with ASD. However, these two representational skills did not individually predict social competence.

• The role of cognitive representation ability became non-significant when language variables were controlled.

• Understanding and using non-verbal communication explained a large portion of the variance in social competence of children with ASD. Non-verbal communication skills appeared to be more significant than verbal communication skills for their social competence.

• **Implications:** 1) Intervention programs that aim to ameliorate social skills of children with autism should pay special attention to improving non-verbal communication skills. 2) Research that examines sociocognitive correlates of social competence should include measures that tap both understanding of internal states and mental states. Both of these skills appear to have similar significance for social competence in children with ASD.

References can be provided upon request.