

## **Role Taking and Social Competence in Autism and Mental Retardation**

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*Recent data suggest that individuals with autism show deficits in social cognitive abilities when compared with nonautistic persons matched for mental age. These deficits have been proposed as a basis for the social interaction difficulties seen in autistic persons. In the present study, autistic youth were compared with a matched group of nonautistic mentally retarded youth on three role-taking tasks and three measures of social competence. Results indicated that the autistic group was relatively deficient on each of the social competence measures and on one of the role-taking measures. The role-taking measure on which the groups differed also correlated significantly with each of the social competence measures. Results were discussed in terms of the interplay between social cognitive abilities and social interaction.*

The basis for severe social interaction deficits in infantile autism has been the focus of considerable speculation and controversy (Damasio & Maurer, 1978; Fein, Pennington, Markowitz, Braverman, & Waterhouse, 1986; Ferster, 1961; Kanner, 1943; Ornitz & Ritvo, 1968; Rimland, 1964; Rutter, 1968; Tinbergen & Tinbergen, 1976). In recent years, interest in investigating the possibility of a cognitive basis for these social difficulties has mushroomed. Several studies have supported such a possibility (Hermelin & O'Connor, 1970; Lovaas, Schreibman, Koegel, & Rehm, 1971; Rutter, 1983; Sigman & Ungerer, 1981). In addition to these basic deficits, several studies have examined the social cognitive abilities of individuals with autism (Hobson, 1982; Langdell, 1978). Baron-Cohen, Leslie, and Frith (1985, 1986) reported specific social cognitive deficits in role-taking ability in autistic children when compared to Down syndrome and nonhandicapped control children.

These studies suggest that autistic children evince significant social cognitive deficits when compared to their mental age peers. The presence of

specific role-taking deficits indicates a need to explore the relationship between such social cognitive variables and social competence, an area notably deficient in autistic persons.

Higgins (1981) conceptualized role taking as having three distinct dimensions: "inference," "controlling the self," and "interrelating multiple elements." Development along these dimensions involves an increase in the level of inference and reasoning about the psychological characteristics or mental states of another, an increase in the ability to prevent one's own viewpoint from interfering with one's judgment about the viewpoint of another, and an increase in the number and relation of mental elements involved in a judgment, respectively.

The assessment of social competence is even more complex (Gresham, 1986). The difficulties associated with the definition of this construct are reflected in the multiplicity of assessment procedures available. In view of these difficulties, any attempt to obtain a comprehensive picture of social interaction competence requires multimethod assessment. For present purposes, we employed reports obtained from significant others and direct observation of behavior.

In sum, the primary purpose of the present study was to explore further social cognitive deficits in autism. More specifically, we examined the presence of role-taking deficits in autistic and nonautistic mentally retarded youth and examined the relationship between role-taking ability and social interaction skills. We sought to replicate and extend previous findings by including both the Baron-Cohen et al. tasks and a role-taking assessment procedure from the developmental literature, and by exploring the relationship between measures of role-taking ability and measures of social competence.

## METHOD

### *Subjects*

All autistic youth ( $n = 10$ ) were male and were independently diagnosed autistic employing the Ritvo and Freeman (1978) criteria. Control subjects ( $n = 10$ ) [hereafter referred to as the mentally retarded (MR) group], also all male, were diagnosed mentally retarded by DSM-III criteria (American Psychiatric Association, 1980) and were matched for age (autistic:  $\bar{x} = 183$  months,  $SD = 19.4$ ; MR:  $\bar{x} = 181$  months,  $SD = 17.0$ ) and nonverbal IQ (autistic:  $\bar{x} = 61$ ,  $SD = 15.2$ ; MR:  $\bar{x} = 61$ ,  $SD = 9.7$ ). Because specific information regarding the application of the Ritvo and Freeman criteria in the diagnosis of autistic subjects was unavailable, the present study included a comparison of the group scores on the Childhood Autism Rating Scale

(CARS; Schopler, Reichler, Devellis, & Daly, 1980). On this scale, which assesses the presence of behavioral characteristics of autism, the mean score ( $\bar{x} = 44$ ) of the autistic group was significantly higher than that of the mentally retarded group ( $\bar{x} = 19$ ;  $t = 19.82$ ;  $p < .0001$ ). The mean score placed the autistic subjects in the "severely autistic" range of CARS scores whereas the mean score of the MR group fell in the "not autistic" range.

In an effort to control (by matching) subjects' general level of behavior dysfunction and the effects of residential placement, all subjects were drawn from the student population of a residential school serving both autistic and nonautistic mentally retarded students.

Subjects ranged in age from 12 years 9 months to 17 years 10 months ( $\bar{x} = 15$  years, 2 months;  $SD = 1$  year, 6 months). Nonverbal IQs ranged from a low of 40 to a high of 88 ( $\bar{x} = 61$ ;  $SD = 12.5$ ). All subjects fell into the mentally retarded range based on overall level of cognitive functioning.

### *Assessment Procedures*

The measures of role-taking ability were chosen to reflect each of the three dimensions proposed by Higgins (1981). In addition, in order to avoid handicapping the autistic subjects due to their linguistic deficiencies, tasks were limited to those which involved nonverbal response modes.

*Inference—The Picture Sequence Task.* Introduced by Baron-Cohen et al. (1986), this task involves placing pictures in the correct sequence to tell a story.

*Controlling the Self—The Puppet Scene.* Taken from Baron-Cohen et al. (1985), this task tests the subject's ability to attribute to a puppet a belief that is known to be false.

*Interrelating Multiple Elements—The Penny-Hiding Game.* The present study employed DeVries' (1970) adaptation and scoring system for this task, first described by Gratch (1964). In the context of a game played with the subject, the investigator examines and rates the subject's ability to think recursively (i.e., "to think about what another is thinking about what I am thinking").

Further details regarding the tasks and their scoring may be found in the primary sources cited above.

Role-taking assessment was conducted by the primary investigator and a research assistant trained on each of the role-taking procedures. Mentally retarded and autistic subjects were tested in random order with each examiner testing subjects from both groups; further, the procedures were counter-balanced with regard to order of presentation across subjects.

Although experimenters were not blind to subject diagnosis, for the measure that required experimenter rating (the Penny-Hiding Game) rather than yielding objective results, one fourth of the subjects, selected at ran-

dom, were rescored by assistants who were blind to diagnosis. Interrater agreement was high ( $r = .91$ ; Pearson product-moment correlation).

The assessment of social interaction competence also involved three distinct measures.

*Teacher Report—The Social Performance Survey Schedule (SPSS).* Originally developed for a college student population by Lowe and Cautela (1978) and containing 100 items, a subset of 57 items has been selected for use as a staff rating instrument for developmentally disabled persons (Matson, Helsel, Bellack, & Senatore, 1983). Of primary interest in the present study was the Appropriate Social Skills factor of this scale, consisting of 26 items. The SPSS was completed by the subjects' classroom teachers.

*Parent/Caregiver Report—Socialization Domain of the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984).* Of primary interest for the present study was the Interpersonal Relationships subdomain as it addresses most clearly the subjects' social interaction skills. The VABS was completed by the parent or guardian, if available, or by one of his primary residential counselors.

*Behavioral Observation—Adapted from Ollendick (1981).* Subjects were videotaped in a "free-time" setting in groups of six consisting of two autistic subjects, two mentally retarded subjects, and two adults. Subjects were initially divided into two groups according to age (12–14 years and 15–17 years); within each age division, assignment to free-play groups was made randomly. A variety of leisure activities was available and each group of subjects was instructed to play for three 20-min free-time sessions. With one exception, the sessions were spread across at least 2 days; all sessions for one group were conducted on a single day due to subject illness and an impending school vacation. Videotapes were subsequently coded by trained research assistants blind to the diagnoses of the subjects. A description of the scoring procedure is provided elsewhere (Ollendick, 1981). Tapes were coded independently by trained research assistants and interrater reliability (percentage agreement), computed for one fourth of all play sessions, averaged 93%.

## RESULTS

### *Role-Taking Analyses*

Contrary to expectations and previous findings (Baron-Cohen et al., 1985, 1986), measures of Inference (Picture Sequence Task) and Controlling the Self (Puppet Scene) role-taking dimensions failed to reveal significant differences between the autistic and mentally retarded youth (Table I). The former showed virtually no difference between the groups ( $t = 0.09$ ,  $p = .93$ ) whereas the latter reflected only a marginal difference,  $\chi^2(1) =$

Table I. Role-Taking Assessment

Measure	Group			
	Autistic		Mentally retarded	
	Mean	SD	Mean	SD
Picture Sequence	2.5	2.80	2.4	1.84
Puppet Scene <sup>a</sup>	0.3	0.48	0.6	0.52
Penny-Hiding Game	6.6	1.71	9.9	0.32

<sup>a</sup>Pass scored 1; fail scored 0.

1.8,  $p = .18$ . However, the third dimension, Interrelating Multiple Elements (Penny-Hiding Game), produced a highly significant between-groups difference ( $t = 5.91$ ,  $p < .001$ ), supporting the Baron-Cohen et al. (1985) finding that autistic children are deficient in at least one component of role-taking ability.

### *Social Competence Analyses*

As expected, the measures of social competence revealed a number of significant differences between groups (Table II). The autistic subjects were rated as significantly less competent on the Interpersonal Relationships sub-domain of the VABS ( $t = 2.46$ ,  $p < .05$ ) and on Appropriate Social Skills (SPSS) ( $t = 4.07$ ,  $p < .01$ ). Further, the autistic group engaged in fewer social interaction intervals (intervals coded Peer or Adult) than the mentally retarded group during the free-play sessions ( $t = 5.06$ ,  $p < .001$ ); finally, for the autistic subjects, fewer of the intervals involved positive activity ( $t = 3.15$ ,  $p < .01$ ).

### *Correlational Analyses*

Two dimensions of role-taking (Controlling the Self and Interrelating Multiple Elements) correlated significantly ( $p < .05$ ) with the Appropriate

Table II. Social Competence Assessment

Measure	Autistic		Mentally retarded		<i>t</i>	<i>p</i>
	Mean	SD	Mean	SD		
VABS-IR	50.1	11.1	64.3	12.3	2.46	.03
SPSS-AS	1.2	0.6	2.1	0.8	4.07	.003
Interaction intervals	30.2	28.2	95.0	28.7	5.06	.0007
Positive activity intervals	66.2	36.8	99.3	28.4	3.15	.01

**Table III.** Role Taking/Social Interaction Competence Intercorrelations

Measure	VABS IR	SPSS AS	Interaction intervals	Positive intervals
Picture Sequence	.07	.31	-.08	.08
Puppet Scene	.11	.45 <sup>a</sup>	.01	-.10
Penny Hiding	.44 <sup>a</sup>	.52 <sup>b</sup>	.69 <sup>c</sup>	.47 <sup>a</sup>

<sup>a</sup>*p* < .05.<sup>b</sup>*p* < .01.<sup>c</sup>*p* < .001.

Social Skills factor of the Social Performance Survey Schedule. In addition, Interrelating Multiple Elements (Penny-Hiding Game) correlated significantly with the Vineland subscale Interpersonal Relationships ( $p < .05$ ). The Penny-Hiding Game was also significantly related ( $p < .01$ ) to the proportion of time spent interacting with others in the free-play setting and to the proportion of time spent in positive activities (Table III).

## DISCUSSION

The results of the present study are somewhat mixed with regard to our primary hypotheses, namely, that autistic individuals are uniquely deficient in role-taking ability and that this deficiency is related to social interaction deficits. Although support was garnered for at least one dimension of role taking, that of Interrelating Multiple Elements, it was not found for Higgins' (1981) other two dimensions, Inference and Controlling the Self.

Perhaps the most surprising result in the present study was the failure to replicate the Baron-Cohen et al. (1985, 1986) findings. Using the same measures used in those studies to assess the role-taking dimensions of Inference and Controlling the Self, no significant differences were found between groups and virtually no significant correlations with social competence measures.

One explanation for these unexpected results is that the mentally retarded subjects in the present sample were nearly as deficient in these dimensions of role-taking ability as the autistic subjects. The mentally retarded subjects were all students in a residential school for learning and behavior problems and, as Chandler, Greenspan, and Barenboim (1974) demonstrated, these students are more likely to be deficient in role-taking ability. Such an explanation, however, argues against the Inference or Controlling the Self dimensions of role taking as unique cognitive variables associated with the more severe social deficits seen in autistic individuals.

The third dimension of role taking, Interrelating Multiple Elements, on the other hand, showed more promise with regard to the primary hypotheses of the present study. These two carefully matched subject groups differed significantly on this dimension, indicating that the deficit may be related to specific characteristics of autism. Further, significant relationships with social competence variables were found, suggesting that it may be closely associated with the social interaction deficits of autism. This dimension appears to be related particularly to direct measures of positive social skills as well as to teacher and parent/guardian reports of such behavior.

A deficit in the ability to interrelate multiple cognitive elements may be related to the Lovaas, Koegel, and Schreibman (1979) finding that autistic individuals have difficulty with discriminations based on multiple elements. Although their finding was based on visual discrimination tasks, our results suggest that such a deficit may extend to social cognition as well. Thus, in the same way that individuals with autism tend to attend to single, limited, and often irrelevant details in making visual discriminations, our findings suggest that the autistic may be unable to attend simultaneously to the multiple, subtle, cognitive components of successful role taking and competent social interaction.

It is important to note that the present findings do not assist in making causal statements regarding the basis of deficient social competence. They do, however, support the notion that social cognitive functioning can be assessed in autistic individuals and that social cognitive variables may be useful in understanding specific social interaction difficulties. These results indicate a need to explore further the Interrelating Multiple Elements dimension of role-taking ability. The ability to infer thoughts and feelings in a recursive fashion appears to have excellent potential in the search for social cognitive variables associated with social interaction competence.

More importantly for the populations represented in the present study, the results have significant implications for further clinical research and intervention. These data suggest a need for further study to determine whether the ability to interrelate multiple elements can be increased through intervention and whether such increases are reflected in improved social interaction competence in individuals who are deficient in this competency.

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