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Self-Recognition Deficits in Autism: Syndrome-Specific or General Developmental Delay?

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Many reports can be found in the theoretical literature that refer to a lack of self-awareness or a failure to distinguish self from nonself as a characteristic of autistic children. The empirical literature also contains reports of behaviors in autistic children that have often been taken as reflective of a failure to differentiate self, i.e., pronominal reversal, gaze aversion. The present study investigated the development of self-recognition in 15 autistic children in an effort to determine whether failures of self-recognition were of possible diagnostic significance for the syndrome or rather were reducible to general indices of developmental function, i.e., mental age. Fifty-three percent of the sample showed clear self-recognition. On the basis of a developmental assessment and data from a teacher questionnaire, these children were found to be functioning at mental ages akin to developmental norms for self-recognition. Those who failed to show self-recognition had mental ages below the developmental level at which many children recognize themselves and significantly lower than those autistic children who showed self-recognition. The results suggest that even when autistic children fail to recognize their self-images, this failure can be taken not as evidence for a syndrome-specific deficit but as a reflection of a general developmental delay.

In autistic infants and children, a lack of self-awareness has often been cited as a feature of the syndrome. Historically, autistic children have been described as having an undifferentiated sense of self (cf. Bettelheim, 1967;

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Goldfarb, 1970; Mahler, 1952), as suffering from an "inability to identify self and other" (Beller, 1962), or as having an "inability to maintain a distinction between self and non-self" (Ornitz & Ritvo, 1968). The Group for the Advancement of Psychiatry (1966) listed "the absence of a sense of personal identity" among their criteria for autism. Anthony (1967) remarked upon the "confusion of self and non-self" among autistic children, and Creak and the British working party (1961) included "apparent unawareness of personal identity" among their diagnostic criteria of the syndrome.

Theoretical systems concerned with the etiology of autism (cf. Bettelheim, 1967; Mahler, 1952) as well as clinical observations seem to have contributed equally to the notion that autistic children have an underdeveloped or undifferentiated sense of self. Characteristic language patterns such as pronominal reversal, the absence of personal pronouns in speech, echolalia, and failures in comprehending references to the self (Fay, 1979; Ornitz & Ritvo, 1976) have often been taken as supportive of this notion. Other behaviors, too, have been taken as evidence of arrest in the development of the self, e.g., aberrant eye contact, delayed or absent anticipatory response to being picked up in infancy, aversion to physical contact, and failures to develop social relationships (Hutt & Ounsted, 1966; Ornitz & Ritvo, 1968), though no experimental procedures have been reported in the literature that have clearly delineated autistic children as lacking a sense of self.

One way in which the development of the concept of self-awareness has been studied empirically in normal young children has been through the use of the mirror self-recognition procedure (cf. Amsterdam, 1972; Bertenthal & Fischer, 1978; Lewis & Brooks, 1978). In this technique, an infant or toddler has its nose marked with a small amount of rouge and is then faced toward a mirror. If the child reaches toward his or her nose rather than the mirror, the child is said to have demonstrated self-recognition (Amsterdam, 1972; Lewis & Brooks, 1978).

As in other areas of psychological ontogenesis, a developmental pattern for self-recognition has been described. In the neonatal period and for several subsequent months, the infant remains indifferent to the mirror image, often treating it much like a "playmate" until about 10-12 months (Amsterdam & Greenberg, 1977). Around 1 year of age, a variety of new responses emerge, including curiosity, avoidant behavior, bashfulness, and withdrawal (Amsterdam, 1972; Bertenthal & Fischer, 1978). By 14 months, some infants act "embarrassed" or "self-conscious" of their reflection (Amsterdam, 1972). By 21-24 months, most children show a definite recognition of their reflection by touching their rouge-altered noses (Bertenthal & Fischer, 1978; Lewis & Brooks-Gunn, 1979).

In mentally retarded infants and children, such as those diagnosed as having trisomy-21 or Down's syndrome, the appearance of clear self-directed responses to their mirror image occurs at a much later time than in age-matched normals. When children were matched for mental age (MA) rather than chronological age, however, Mans, Cicchetti, and Sroufe (1978) found that youngsters with Down's syndrome demonstrated self-recognition at the same time as normal youngsters and that the "stages" or "processes" in the emergence of self-recognition were similar in Down's syndrome and normal youngsters. Mans et al. (1978) also found that the higher functioning Down's children showed more progress in the achievement of self-recognition than the lower functioning children in the same diagnostic category. This slowed speed but parallel sequence of development suggests an intimate relationship between the development of self-recognition and mental age.

Viewing self-recognition as a developmental phenomenon reflecting self-awareness and associated with mental age, and considering childhood autism as a disorder characterized by distortions in the timing, rate, and sequences of psychological functions (American Psychiatric Association, 1980), one realizes that this question emerges: Can the lack of self-differentiation noted in autism be regarded as diagnostically significant for the syndrome, or rather, can it be reducible to mental age? It is to this question that the present study was addressed.

METHOD

Subjects

Fifteen children meeting the criteria of the National Society for Autistic Children (NSAC, 1978) for childhood autism constituted the sample. Five of the subjects were females, 10 were males, and all attended classes at the Douglass Developmental Disabilities Center at Rutgers University. The mean chronological age of the children was 7.9 years (range 3.5 to 10.4 years). All children in the sample were severely to profoundly mentally retarded.

Procedure

Prior to participation in the self-recognition procedure, all children were brought to a 7′ × 12′ test room for developmental assessment. Depending upon the child's chronological age and level of function, the

child was either administered the Bayley Scales of Infant Development or the Wechsler Preschool and Primary Scale of Intelligence. In all cases, however, the aim of the assessment was to obtain not an IQ score but an estimate of mental age.

One week later, the child was brought to the same room for the mirror recognition task, which was videotaped for later scoring. Each child was placed in front of a mirror mounted on a wall. After the child had faced the mirror for 20 seconds, the experimenter turned the child around and pretended to wipe the child's nose but instead smeared a small amount of purple theatrical rouge on the tip of the child's nose. Again, the child was turned toward the mirror for 20 seconds. Later, the videotape record of the mirror procedure was shown to two research assistants who were asked to code independently each child's behavior in the situation. The coding format employed closely resembled that used by Mans et al. (1978) and included choices for the child's gaze behavior (e.g., looks at mirror, does not look), affective expression (e.g., smiles, frowns), vocalizations, and motor behavior (e.g., leans toward mirror, touches mirror, touches face).

In order to determine whether those children lacking in self-recognition evidenced other behavioral deficiencies, a checklist for use in the study was devised that included 5-point ratings of the child's behavior in a variety of school-related and interpersonal areas. Included on the checklist was a question related to the child's attentional skills, stereotypic behavior, overall cognitive skills, expressive and receptive language, self-care, interpersonal skills, emotional responsiveness, and affect giving. These variables were rated in a scale from 1 (poor) to 5 (excellent). Each of the questions related to the frequency of the behavior or the qualitative functioning of the child in that domain and was selected to provide concurrent validity to the developmental assessment data, and to explore functioning on socioaffective dimensions conceived to be related to the development of self-awareness (cf. Lewis & Brooks-Gunn, 1979).

RESULTS AND DISCUSSION

In coding whether children were considered recognizers or not, interrater reliability was perfect (100%). Eight of the 15 children in the sample (53.3%) showed clear evidence of self-recognition by touching their rouge-altered noses when placed in front of the mirror. The remaining 7 children (46.7%) failed to show self-directed behavior. Three of the nonrecognizers touched the mirror as if the rouge were on the surface of the mirror, while the remaining 4 children behaved in either an avoidant or an indifferent fashion toward the mirror image. Two-tailed *t* tests were

Table I. Comparisons of Recognizers and Nonrecognizers on Developmental Assessment Scores

Group	*N*	Chronological age	Mental age[a]
Self-recognizers	8	8.23 years	38.13 months
Nonrecognizers	7	7.72 years	22.14 months

[a] Group mental age estimates differed significantly, $t(13) = 2.39$, $p < .04$.

conducted on the developmental assessment scores to examine differences between groups of recognizers and nonrecognizers. As can be seen from Table I, no difference in chronological age was found across groups, although the recognizers were found to have significantly higher mental ages (mean = 38.13 months, *SD* = 17.4) than the nonrecognizers (mean = 22.14 months, *SD* = 8.7).

Two-tailed *t* tests on the data from the teacher's questionnaire supported this finding and revealed several other differences between the groups. These differences are summarized in Table II. It can be seen that recognizers are almost uniformly described by their teachers as functioning at a higher level cognitively, affectively, and behaviorally than nonrecognizers. Specifically, recognizers were rated as more attentive, higher in expressive and receptive language, more skilled interpersonally, more emotionally responsive, and more affectionate than nonrecognizers. These differences may, in part, be attributable to the significant group difference in mental age; however, the small sample precluded analyses of covariance that could have helped to resolve this question. It is also possible that biasing effects may have been operative, influencing teachers to rate those children functioning high in some domains (e.g, language) as high in all

Table II. Means and Significant Differences for Teacher's Behavioral Observation Checklists

Scale	Group		Significance level
	Recognizers (*N* = 8)	Nonrecognizers (*N* = 7)	
Attentional skills	3.25	2.41	.03
Stereotypic behavior	3.87	3.57	n.s.
Overall cognitive skills	4.00	2.43	n.s.
Expressive language	3.50	1.57	.01
Receptive language	4.25	1.71	.001
Self-care	3.88	2.14	.06
Interpersonal skills	3.25	1.86	.05
Emotional responsiviness	4.50	2.14	.02
Affect giving	4.50	2.00	.02

domains; though the extent to which this may have been true is impossible to determine, the issue is explored more fully below. Nevertheless, in those children receiving the lowest teacher ratings, the nonrecognizers, behaviors such as lack of eye contact, sparsity of social relationships, and the treatment of persons as objects were more commonly observed.

Table III depicts the significant intercorrelations between the scales of the teacher checklist and the chronological and mental age scores. Examination of the table reveals many high intercorrelations between scales of the teacher ratings. Notably, expressive language, attentional skills, and emotional responsiveness all correlate highly with one another and with the scores obtained on mental age assessment. Together with the high positive correlation between teacher's ratings of expressive language and overall cognitive functioning (.87), these results suggest that the teachers' assessments of their students' overall level of cognitive functioning depended heavily on the children's language skills. This reliance on expressive language by the teachers in assessing their children runs consistent with other empirical literature (cf. Prior, 1979; Ferrari, 1982) stressing the importance of expressive language in autistic children and its relation to the child's performance across a multitude of settings.

The group differences in mental age found between recognizers and nonrecognizers helps to substantiate the link between general developmental indices like mental age and the development of self-recognition reported by Mans et al. (1978). The existence of this relationship in autism is especially noteworthy since it undermines theoretical contentions that an undeveloped, or less than adequately differentiated, sense of self is characteristic of autism. It appears, instead, that problems related to the differentiation of self are a reflection of a lower level of cognitive function (as indicated by lower mental age and lower scores on other sociocognitive variables) rather than a phenomenon related specifically to the syndrome. This conclusion must be viewed with some caution, however, since the psychological feeling state, sense of self, can at best only be inferred on the basis of observation of the behaviors taken to evidence self-recognition. Nonetheless, tests of self-recognition represent the most widely advocated methods in investigations concerned with the development of the sense of self (cf. Lewis & Brooks-Gunn, 1979).

The clinical impression of an undifferentiated sense of self in autism has been historically widespread. One reason for this might be that lack of social relatedness witnessed in autism was generalized to include a lack of a sense of self as well. The present findings suggest that even when autistic children fail to recognize their self-images, this failure cannot be taken as evidence for a syndrome-specific deficit but instead is a reflection of a general developmental delay perhaps best represented by global indices of developmental level such as mental age.

Table III. Correlations Between Teacher Checklist Scores and Mental and Chronological Age

	Chronological age	Mental age	Attentional skills	Stereotypic behavior	Overall cognitive	Expressive language	Receptive language	Self-care	Interpersonal skills	Emotional responsiveness	Affect giving
Chronological age		.65[a]	.35	−.22	.20	.28	−.03	.40	.05	.41	.22
Mental age			.72[a]	−.31	.55[a]	.73[a]	.44	.45	.31	.72[a]	.53[a]
Attentional skills				−.33	.81[a]	.81[a]	.72[a]	.63[a]	.62[a]	.70[a]	.69[a]
Stereotypic behavior					.07	−.08	.13	−.04	−.13	−.09	.12
Overall cognitive						.87[a]	.71[a]	.59[a]	.53[a]	.58[a]	.67[a]
Expressive language							.78[a]	.60[a]	.56[a]	.74[a]	.78[a]
Receptive language								.63[a]	.72[a]	.61[a]	.72[a]
Self-care									.62[a]	.47	.59[a]
Interpersonal skills										.51	.57[a]
Emotional responsiveness											.91[a]

[a] $p < .05$.

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