VALIDITY OF TWO CHILDHOOD AUTISM RATING INSTRUMENTS FOR USE WITH AUTISTIC ADOLESCENTS

THESIS

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It is now known that autism is a lifelong handicapping condition. While some of the characteristic behaviors of autistic children remain unchanged in adolescence and adulthood, there is evidence that other behaviors change as a function of development. Assessment instruments for identifying autism are generally intended for use with young children and may not accurately assess autism in adolescents. Two studies compared autistic adolescents with matched autistic children and nonautistic adolescents on two autism rating scales. The validity of the Childhood Autism Rating Scale for use with adolescents was supported while the validity of the Prescreening Checklist was questioned. The findings were discussed in relation to the age-related changes which occur in autistic adolescents.

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VALIDITY OF TWO CHILDHOOD AUTISM RATING INSTRUMENTS FOR USE WITH AUTISTIC ADOLESCENTS

Exactly 40 years after Kanner first described the syndrome of early infantile autism in 1943 (Kanner, 1943), the first book on autism in adolescents and adults was published (Schopler & Mesibov, 1983). In the intervening years, extensive research has been conducted on autistic children, but in fact, the idea that an adolescent or adult could also be autistic is relatively new. The chapters in that first book "represent the current state of knowledge rather than established research" (Schopler, 1983, p. 7). Research on this special population is in its infancy.

Autism is described by its symptoms, and not all authorities agree on which ones are essential. There is general agreement that it is a rare pervasive developmental disorder in which three features must be present: a) impaired social development in relating to people, objects and events, b) disturbance of language and cognitive skills, and c) early onset before 30 months of age (American Psychiatric Association, 1980; Ritvo & Freeman, 1978; Rutter, 1978a). The National Society for Autistic Children considers a disturbance of responsiveness to sensory stimuli to be a necessary criteria (Ritvo & Freeman, 1978). Rutter (1978a) adds "insistence on sameness" to the list of critical symptoms

and defines this term, which originated with Kanner, as stereotyped play, abnormal preoccupation, or resistance to change. In addition, mental retardation is frequently associated with autism. Approximately 40 percent of autistic children have IQ's below 50, and 70 percent have IQ's below 70 (Brooker & Mareth, 1982).

Instruments for the assessment of autism have been developed for use with young children. For example, the Behavior Rating Instrument for Autistic and Atypical Children is intended for children six years old and under (Ruttenberg, Dratman, Fraknoi & Wenar, 1966), and the Childhood Autism Rating Scale (CARS) was developed on a group of 537 children, 55 percent of whom were less than six years old, and only 11 percent were 10 or above (Schopler, Reichler, Devellis & Daly, 1980). The Diagnostic Checklist for Behavior-Disordered Children (From E-2) provides a retrospective diagnosis based on parents' reports of child behavior before the age of five (Rimland, 1971).

It is now known that autism is a lifelong handicapping condition, making the identification of autism in adolescents and adults the next logical step forward. The currently used instruments which were developed for use with children may or may not be appropriate for use with adolescents. The changes which occur in autistic children during adolescence need to be documented. As a first step, the literature which pertains to the developmental course of autism will be reviewed.

Review of the Literature on Autistic Adolescents

Mesibov (1983) describes a major difficulty for those interested in autistic adolescents--that of a lack of empirical data. Most of what is known comes not from studies of adolescent populations per se, but indirectly from follow-up studies which were concerned primarily with outcome. For example, Eisenberg (1956) provided follow-up data on 63 children ranging in age from nine to 25, with a mean of 15 years. Rutter and his colleagues (Rutter, 1970; Rutter, Greenfeld & Lockyer, 1967; Rutter & Lockyer, 1967) describe follow-up data on another group of 63 children. The mean age at follow-up was 15 years, seven months. This study included a matched group of non-psychotic controls treated at the same hospital, and each child was seen individually at follow-up. Another follow-up study that included a non-psychotic control group was DeMyer et al. (1973). Of the 120 autistic children studied, 24 were 15 years old or older at the time of follow-up.

A smaller amount of what is known about the autistic adolescent comes from cross-sectional studies (Ando & Yoshimura, 1979; Ando, Yoshimura & Wakabayashi, 1980), a report on all the developmentally disabled persons receiving services in the state of New York (Janicki & Jacobson, 1983; Janicki, Lubin & Friedman, 1983), a report on five cases of severe decline at puberty (Gillberg & Schaumann, 1981), and examples of the adult recollections of formerly autistic

children (Bemporad, 1979; Volkmar & Cohen, 1985). Findings from these and the follow-up studies are gratifyingly consistent in some areas so that there are features of autistic adolescent development which we can describe with a degree of certainty. Specifically of interest are the areas of behavior, language and cognitive abilities, social adjustment, and affective status.

Behavior. Findings in the area of behavioral changes associated with adolescence are not as consistent as findings in other areas. Rutter, Greenfeld, and Lockyer (1967) reported that autistic children became more adaptable as they grow older. One of the classic symptoms of early infantile autism, resistance to change, tended to become less pronounced. Abnormal preoccupations and other obsessive behaviors also tended to diminish, though in very few subjects did they disappear entirely. Sometimes they increased during middle childhood before a decline in adolescence. Bemporad's (1979) case study of a 31-year-old man, Jerry, originally diagnosed as autistic by Kanner, describes the transformation of the child's insistence upon sameness into the young man's compulsive rituals that revolved around such activities as showering, dressing and going to bed.

There seems to be no general statement that can yet be made regarding changes in aggressive and self-injurious behaviors (Mesibov, 1983). Gillberg and Schaumann report their experience is that aggressive acts and self-injury

"diminish gradually during childhood" (1981, p. 365), but they offer no empirical support for this observation. Rutter, Greenfeld and Lockyer (1967) did not find a significant change in aggressive acts, though Rutter (1970) notes that the adolescent does become more of a behavior management problem, partly due to increased size. Self-injury was as likely to increase as decrease and sometimes showed the pattern noted for obsessional behaviors, that is, an increase at puberty followed by improvement in later adolescence.

IQ may be an important variable in behavior changes. Ando and his colleagues (Ando & Yoshimura, 1979; Ando, Yoshimura & Wakabayshi, 1980) reported on differences between a group of six to nine-year-old autistic children and a group of 11 to 14-year-olds. Ninety percent of these children had IQ's of 50 or below, a much larger percentage than found in other studies. They reported no improvement with age in stereotyped behaviors, number of aggressive acts, or incidence of self-injury. However, these children were somewhat younger than other groups as well, and age may be as important as IQ in explaining the inconsistent findings.

Hyperactivity may gradually change as the child grows, being "replaced in middle or late childhood by a mixture of over and underactivity and finally by marked underactivity" (Ando & Yoshimura, 1979, p. 91). The hypokinesis is a severe form, "perhaps the most prominent of all the problems of adolescent psychotic children (Rutter, Greenfeld & Lockyer,

1967, p. 1191), and most likely to occur in children who initially were hyperkinetic. This change is not however exclusive to autistic children; the same decrease with age in activity level is seen in mentally retarded children (Ando & Yoshimura, 1979).

Adaptive behaviors improve somewhat in adolescence, though not in all areas, and some of the findings are inconsistent. Rutter, Greenfeld and Lockyer (1967) reported eating and sleep disturbances as markedly improved. Problem behaviors decreased for adolescents living in institutions and still greater improvement was seen for those living in the community. However, the self-help skills of eating, toileting and dressing did not significantly improve with age in a recent survey of autistic people receiving developmental services in the state of New York (Janicki, Lubin & Freidman, 1983). It was also reported that practically none of the autistic adults were capable of independently using the telephone, cooking, doing the laundry or shopping. This survey included only persons receiving services from the state, therefore older autistic people with these skills could have been excluded. Janicki and Jacobson (1983) noted the low proportion of autistic adults of average intelligence in their sample and speculated that those older autistic persons may be wrongly diagnosed as mentally retarded or as having a residual form of childhood schizophrenia. Certainly this presents a bleak picture, with just over half of

the community-based residents having independent toileting skills and 60 percent having independent eating skills. In contrast, Ando, Yoshimura and Wakabayshi (1980) found improved toileting and eating skills and improved self-control among a group of 11 to 14-year-olds as compared with a group of six to nine-year-olds. Despite the fact that most of these children had IQ's of 50 or below, they were in school. Clearly these self-care skills can be taught to autistic children.

Thus there is documentation for improvement in adolescence of adaptive behaviors, changes in activity level, and improvement of self-care skills in an educational setting. When stereotyped behaviors do not improve with age, low IQ may be a factor.

Language and Cognitive Abilities. The findings in the areas of language acquisition and cognitive abilities are more consistent. The lack of functional language is still a major handicap for the autistic child as he or she reaches adolescence and adulthood. Follow-up studies indicate approximately half of autistic children never acquire useful language (DeMyer et al., 1973; Eisenberg, 1956; Rutter, Greenfeld & Lockyer, 1967). Furthermore, the speech is generally present by the age of five or not at all, although there are exceptions. The few late bloomers usually are characterized by a relatively high nonverbal IQ and the autistic children who do acquire language show slow but

consistent improvement through adolescence and perhaps beyond (Mesibov, 1983). Ando and Yoshimura (1979) found significant improvement with age in the communication skills of conversation and comprehension, though both of these skill areas were below those of mentally retarded children with comparable IQ's. In the New York State survey, expressive and receptive language did not improve significantly after the age of five (Janicki, Lubin & Friedman, 1983).

Even in the adolescent who has acquired speech, it is not likely to be normal. Echolalia and pronoun reversal can continue into adolescence and other abnormalities of delivery can make the speech very mechanical sounding, with conversation often consisting of a series of obsessive questions (DeMyer et al., 1973; Mesibov, 1983; Rutter, Greenfeld & Lockyer, 1967). Furthermore, these symptoms of abnormal language appear in autistic children of average or near-average intelligence as often as in mentally retarded autistic children (Bartak & Rutter, 1976).

Academic gains can occur among autistic children during the adolescent period. Rutter (1970) reported that one-third of the autistic children improved their reading, with one-fourth obtaining a second grade level or better. This was below what might be expected based on their age and IQ, and reading accuracy was at a higher level than reading comprehension. Ando, Yoshimura and Wakabayashi (1980) found significant improvement with age in understanding number concepts, but not

in other areas of arithmetic, reading or writing. Rutter and Bartak (1973) found scholastic gains during adolescence, with greater gains in arithmetic than in reading. All gains were a function of the type of classroom the child was in, with a more highly structured environment conductive to greater gains.

Unfortunately for some autistic children, adolescence is associated with a significant decline in cognitive abilities. Gillberg and Schaumann (1981) reported on five cases of a deterioration or severe symptom aggravation which occurred at puberty, following a period in which improvements had been made. The decline was characterized by disruptive behavior, destructiveness, self-injury, restlessness, and loss of social and academic gains. One of the five children was of average intelligence, and none had suffered detected seizures. Rutter (1970) reported a similar progressive deterioration in adolescence characterized by loss of language and decreasing activity level, accompanied in some by the onset of epileptic fits. Often such fits had not been detected in childhood, nor had neurological exams yielded any indication of what was to come. In all, 20 percent of Rutter's group had developed seizures at follow-up and 14 percent of the DeMyer group (DeMyer et al., 1973). While many of the core behaviors and deficits associated with autism do not vary significantly with IQ (Bartak & Rutter, 1976), epileptic seizures is an exeption. They rarely

occur in children whose IQ is above 70 (Bartak & Rutter, 1976; Mesibov, 1983).

Thus, it was consistently found that the lack of functional language is still a major handicap in adolescence. Also, when academic gains occur they are usually below what would be expected based on mental age, and 14 to 20 percent of autistic children develop seizures in adolescence.

Social Adjustment. Certain specific social skills may improve in adolescence, but normal social relationships with peers do not seem to evolve for the autistic child. In the Rutter group, interpersonal relationships tended to improve and in nine (of 63) cases the "social difficulties could no longer be termed autistic in adolescence" (Rutter, 1970, p. 438). These children had developed an interest in and friendliness toward others, but they were still seriously lacking in the skills needed to develop close friendships, especially with members of the opposite sex. Many more children remained socially isolated outside their families.

DeMyer et al. (1973) described their sample as improved in social and conversational skills, with less severely autistic children showing the greatest improvement. The more severe children who improved did so mainly in their relationships with family members, but 15 percent of this subgroup of severely autistic children remained socially oblivious to other people. Rutter and Bartak (1973) found an improvement with age in social responsiveness, defined as

eye contact, play and facial expression. Ando and Yoshimura (1979) found no change with age in the incidence of social withdrawal or eye contact, although this same group of low functioning autistic children did show an increase in participation in group activities (Ando, Yoshimura & Wakabayashi, 1980).

One of the major roadblocks for these children in the development of friendships and social skills seems to be a widely reported lack of empathy for the feelings of others (DeMyer et al., 1973; Eisenberg, 1956; Rutter, Greenfeld & Lockyer, 1967). Even in the children who improve in specific skills there evidently remains a lack of warmth and a tendency to make tactless remarks. Such a problem affected Jerry, the Bemporad (1979) case study. He seemed to reach out during adolescence for more social contact but due to extreme lack of social awareness, he was rejected by his peers. When tested at the age of 18, Jerry made graphic drawings of robot-like people, and was described as unfriendly, distant and working "like a machine" (Bemporad, 1979, p. 190). Tony, a 22-year-old man who wrote a personal account of his experience of autism, also apparently was aware of his lack of normal feelings for other people. He wrote, "I(t) was impossible for me to Give or Recieve love from anybody" (Volkmar & Cohen, 1985, p. 50). Rutter (1978b) describes other autistic adolescents of average or above intelligence, like Jerry and Tony, who remain socially isolated not because

they prefer it, but because they lack the social skills and understandings necessary for normal adolescent relationships.

Thus in the area of social adjustment, specific social skills, such as eye contact or conversation skills, may improve, but normal social relationships do not develop. A widely reported lack of empathy is a major obstacle to that development.

Affective Status. Only passing mention has been made in the literature of the emotional state of the autistic child. What can be gleaned from these brief comments makes the affective status of the child seem a worthy topic of consideration.

Among the Rutter children, anxiety and fears were among the symptoms which showed the most marked improvement at follow-up. Rutter, Greenfeld and Lockyer (1967) reported that in most cases these emotional reactions were a real problem only during infancy and early childhood, though there were isolated cases where these reactions increased in severity or appeared for the first time in middle or late childhood. Among Ando and Yoshimura's (1979) lower functioning group, age did not bring a significant decrease in the incidence of tantrums or fears.

Rutter describes a group of mildly handicapped autistic adolescents who were "deeply distressed" (1978b, p. 503) over their inability to make friends. In adolescence, Jerry suffered a similar experience as he became, seemingly for

the first time, painfully aware that he was different from others. At 18, in response to Card 1 on the Thematic Apperception Test, Jerry said that the boy looked sad because "he will have to spend the rest of his life alone in agony" (Bemporad, 1979, p. 189). Bemporad believed that Jerry's fear of novel experiences as a young autistic child became specialized in adolescence and adulthood as a fear of social interaction in particular. When reviewing his life at the age of 31, Jerry recalled with great intensity the fear and terror of growing up autistic in an unpredictable and confusing world. Tony, at the age of 22, reported that as a child he had been "afraid of everything" (Volkmar & Cohen, 1985, p. 49), and apparently his fears did not diminish even though his adaptive outcome was extraordinarily good. It seems that fear and anxiety may diminish, or it may be that they simply take a different form as the autistic child grows up.

To summarize, various changes in behavior, language, cognitive ability, social adjustment and affective status are associated with the arrival of adolescence in the autistic child. Adaptive behavior can improve somewhat. Obsessive behaviors may diminish, though they do not disappear entirely. Language deficits remain a major problem, so that half never acquire useful speech, and, even among higher functioning adolescents, speech is not completely normal. The vast majority remain mentally retarded, with skill levels perhaps

even lower than retarded nonautistic children of comparable mental age. Approximately 14 to 20 percent of autistic children develop epileptic seizures by the end of adolescence. Social adjustment may improve to the point where their approach to other people may no longer be described as autistic, and there may be an overall reduction in the symptoms of fear and anxiety.

Inconsistencies and some contradictions in the findings have been noted, compounding the problem noted by Mesibov (1983) of a lack of empirical data. Nevertheless, the symptoms of autism remain in adolescence distinguishable from the behaviors of other nonpsychotic clinic patients and mentally retarded children without autism who served as controls in the studies reviewed above.

Purpose of the Study

It is hypothesized that the differences between autistic adolescents and other matched clinical groups are not reflected in current assessment tools designed to diagnose autism in younger children. For example, the young autistic child is characteristically uninterested in relating to other people, and instruments such as the Childhood Autism Rating Scale (CARS; Appendix A) assess this behavior. The autistic adolescent, on the other hand, may have developed an interest in reaching out to other people, but such a response would lower his or her overall CARS score in the direction of a diagnosis of not autistic.

In addition, the CARS assesses "Emotional Responses" and "Fear or Nervousness," two areas of affective status which also may change during adolescence. Inappropriate emotional responses and unexplainable fear reactions would be expected to decrease, again lowering an adolescent's CARS score. Resistance to environmental change is another behavior which can be expected to decrease in adolescence, and which, as measured by the CARS, would produce a lower, "less autistic," score. Similar behaviors are included in the Autistic Prescreening Checklist (Appendix B).

Therefore, two studies attempted to document that adolescent behavior changes are not given consideration in childhood assessment instruments. First, autistic adolescents were compared with autistic children on two autism rating instruments. It was predicted that adolescent scores would be lower, reflecting less severity of autism due to developmental changes. Second, autistic adolescents were compared with a matched group of non-autistic adolescents with the prediction that the instruments may fail to discriminate between the two groups. These studies were designed to a) increase knowledge regarding age-related changes, and b) suggest modifications for the rating instruments.

Method

Study 1: Age-Related Comparisons

Subjects

Subjects for the first study were 22 autistic adolescents and a matched group of 22 autistic children who were students

in a large metropolitan public school district and had been identified by the district's autism program. The groups were matched on IQ and sex, and as closely as possible on ethnicity. Refer to Table 1 for a description of the two samples.

Table 1

Subject Characteristics--Study 1

	Children	Adolescents
Age (years)		
Range	6-10	13-22
Mean	8.6	16.9
Ethnicity		
Black	14	14
White	6	4
Hispanic	2	4
Sex		
Male	19	19
Female	3	3
IQ		
Range	4-108	7-83
Mean	40.0	39.1
SD	26.8	22.4

The school district's diagnosis of autism was based on a) a CARS rating of 30 or higher (in all but one case), b)

performance on the Psychoeducational Profile, a diagnostic test for autistic children (Schopler & Reichler, 1979), and c) the clinical impression of a diagnostic team, which always included a psychologist and a speech clinician. The adolescent group was essentially the entire population of students 12 years or older diagnosed as autistic in the school district, less only two cases for whom matches could not be found.

IQ scores were obtained from school records. When possible, a nonverbal measure of intelligence was used for matching the subjects. IQ scores for the adolescents were obtained from the Bayley (2), the Merrill-Palmer (5), the WISC-R performance scale (4), the Standord-Binet (1), the Leiter (7), and the WAIS verbal scale (1). Additionally, two children whose records indicated only a classification of trainable mentally retarded (TMR) without a specific score were arbitrarily assigned an IQ of 28. The rationale was that 55 was the cut-off point for a classification of TMR and 28 is midway between 55 and zero. IQ scores for the group are somewhat lower than average percentages reported by Brooker and Mareth (1982). Janicki and Jacobson (1983), however, studied a group of 314 autistic adults and found 85 percent of them had IQ scores in the retarded range. This compares well with the present population.

The 22 younger children had also been identified as autistic by the district's autism program using the same criteria as described above. From the autism program's files

on 136 children, 22 were chosen between the ages of six and 10 who could be matched with the adolescents according to sex and IQ. Matching on ethnicity was as close as possible while keeping IQ and sex as higher priorities. As a result, two Hispanic adolescents were matched with younger Caucasian children. IQ scores were obtained from the Bayley (5), the Merrill-Palmer (14), the WISC-R performance scale (2), and the Stanford-Binet (1).

A *t*-test comparison revealed that the IQ scores for the two age groups were not significantly different, $t(21) = .38$, $p > .05$.

Materials

Two instruments used by the school district for identifying autistic children were used in this study to document which behavioral items are valid with autistic children who are 12 years of age or older. The first is the Autistic Prescreening Checklist (Appendix B), a 14-item checklist of behaviors which identifies students who need to be seen by the autism assessment team. It is filled out by the child's teacher and if five or more behaviors are checked, the child qualifies for further assessment. The 14 items were adopted from Clancy, Dugdale and Rendle-Short (1969).

The second is the CARS (Appendix A), a 15-item scale which assesses the presence and severity of autism. The CARS is administered by specially trained personnel using empirically derived scoring criteria. Each of the 15 items

relating to autism is scored on a scale from 1 (no abnormality) to 4 (severe abnormality), with half-point scores possible. A score of 30 is the cut-off point for a diagnosis of autism, and a score of 37 with a rating of 3 or more on at least 5 scales is designated as severe autism. The CARS is a reliable instrument (Parks, 1983), the validity of which has been replicated on children up to the age of 12 years, 11 months (Teal, 1981/1982).

Procedure

The CARS scores for the two groups of autistic children had been calculated by personnel in the school district's autism program. The personnel had been trained by viewing training tapes (produced by the developers of the CARS) and by accompanying qualified people as they administered the test. Training always continued until a reliability of .80 or better was achieved.

Results

Findings related to the Prescreening Checklist will be reported first, followed by those relating to the CARS. An alpha level of .05 was adopted for all analyses.

There was a significant difference between Prescreening Checklist scores for the younger and older groups, $t(21) = 2.07$. The mean number of behaviors checked for the younger group was 9.2 ($SD = 2.4$), and for the older group 7.7 ($SD = 1.9$).

Inter-item reliability for the Prescreening Checklist was assessed by the Kuder-Richardson formula. For the adolescents, the reliability coefficient was quite low, r = .14. For the younger group, r = .51. In the adolescent group, seven of the 14 items were negatively correlated with the total score (see Table 2). Elimination of two items, "Not Cuddly" and "Marked Physical Overactivity," would increase the reliability coefficient to .37. In the younger group, two items were negatively correlated with the total score, "Resists Change in Routine" and "Marked Physical Overactivity." Their elimination would raise alpha to .65.

The two groups did not score significantly different on the CARS $t(21) = 1.31$. The mean score for the adolescent group was 36.6, with a range from 24.5 to 45.5. The mean score for the younger group was 38.3, ranging from 30.0 to 46.0.

Alpha coefficients were computed for each set of CARS scores (see Table 3). For the adolescent group the resulting alpha coefficient was .73, and for the younger group, .79. One item, "Inconsistencies in Intelligence," was negatively correlated with the total score in both groups. Note that elimination of this item would raise alpha to .77 for the adolescent group, and to .83 for the younger.

A Pearson correlation revealed a significant negative relationship between nonverbal IQ and CARS scores for the younger group, $r(20) = -.64$. Among the adolescents there

Table 2

Reliability Analysis of Prescreening Checklist--Study 1

Item	Item-Total Correlation		Reliability if Item Deleted	
	Children	Adolescents	Children	Adolescents
Difficulty in mixing with other children	.18	-.03	.49	.15
Acts as deaf	.10	.21	.51	.03
Resists learning	.14	.27	.50	.00
No fear of real dangers	.17	.50*	.49	-.14
Resists change in routine	-.18	-.11	.57	.21
Indicates needs by gestures	.23	.01	.48	.15
Inappropriate laughing and giggling	.08	.32	.51	.00
Not cuddly	.41	-.34	.43	.32
Marked physical overactivity	-.26	-.17	.59	.24
No eye contact	.36	-.01	.44	.16
Inappropriate attachments to objects	.23	-.03	.48	.16
Spins objects	.46*	.12	.42	.10
Sustained odd play	.18	-.06	.49	.18
Standoffish manner	.61*	.04	.37	.13

*$p < .05$.

Table 3

Alpha Analysis of CARS--Study 1

Item	Item-Total Correlation		Alpha if Item Deleted	
	Children	Adolescents	Children	Adolescents
Relationship with people	.63*	.50*	.76	.70
Imitation	.57*	.59*	.76	.68
Emotional responses	.11	.52*	.79	.70
Use of body	.08	.15	.80	.74
Relation to objects	.63*	.56*	.76	.69
Adaptation to environmental change	.09	.50*	.80	.70
Visual attention	.63*	.04	.77	.74
Listening attention	.39	.40	.78	.71
Touch, taste, and smell	.47*	.12	.77	.75
Fear or nervousness	.67*	.35	.75	.72
Talking	.50*	.22	.77	.73
Pointing and gesturing	.71*	.22	.75	.73
Activity level	.22	.50*	.79	.70
Inconsistencies in intelligence	-.22	-.17	.83	.77
General impression	.78*	.73*	.75	.69

*$p < .05$.

was not a significant relationship between the two variables, $r(20) = -.13$. See Figures 1 and 2 for a graphic representation of the relationships for the two groups. Elimination of the two outlying scores in the adolescent group still failed to show a significant relationship between nonverbal IQ and CARS score for this group, $r(18) = -.39$.

Discussion

The results indicate some important age-related differences between two groups of autistic children, and raise questions about the use of the Prescreening Checklist, especially with adolescents. Adolescent scores on this measure were significantly lower than those of the younger children, as predicted, and furthermore, the difference in internal consistency for the two groups appears to be striking. For the younger children the Checklist has a reliability cofficient of .51, while for the adolescents, only .14. The two poorest items for the adolescent group were "Not Cuddly" and "Marked Physical Overactivity." The word "cuddly" on face value alone seems inappropriate for use with adolescents. When Clancy, Dugdale and Rendle-Short (1969) originally found it to be a useful item in identifying autistic children, the full item read "not cuddly as a baby" (p. 435). When the school district adapted the item for use on a teacher checklist it may be that an important part of the concept was lost. While its use may be justifiable with younger children, since it was one of the stronger

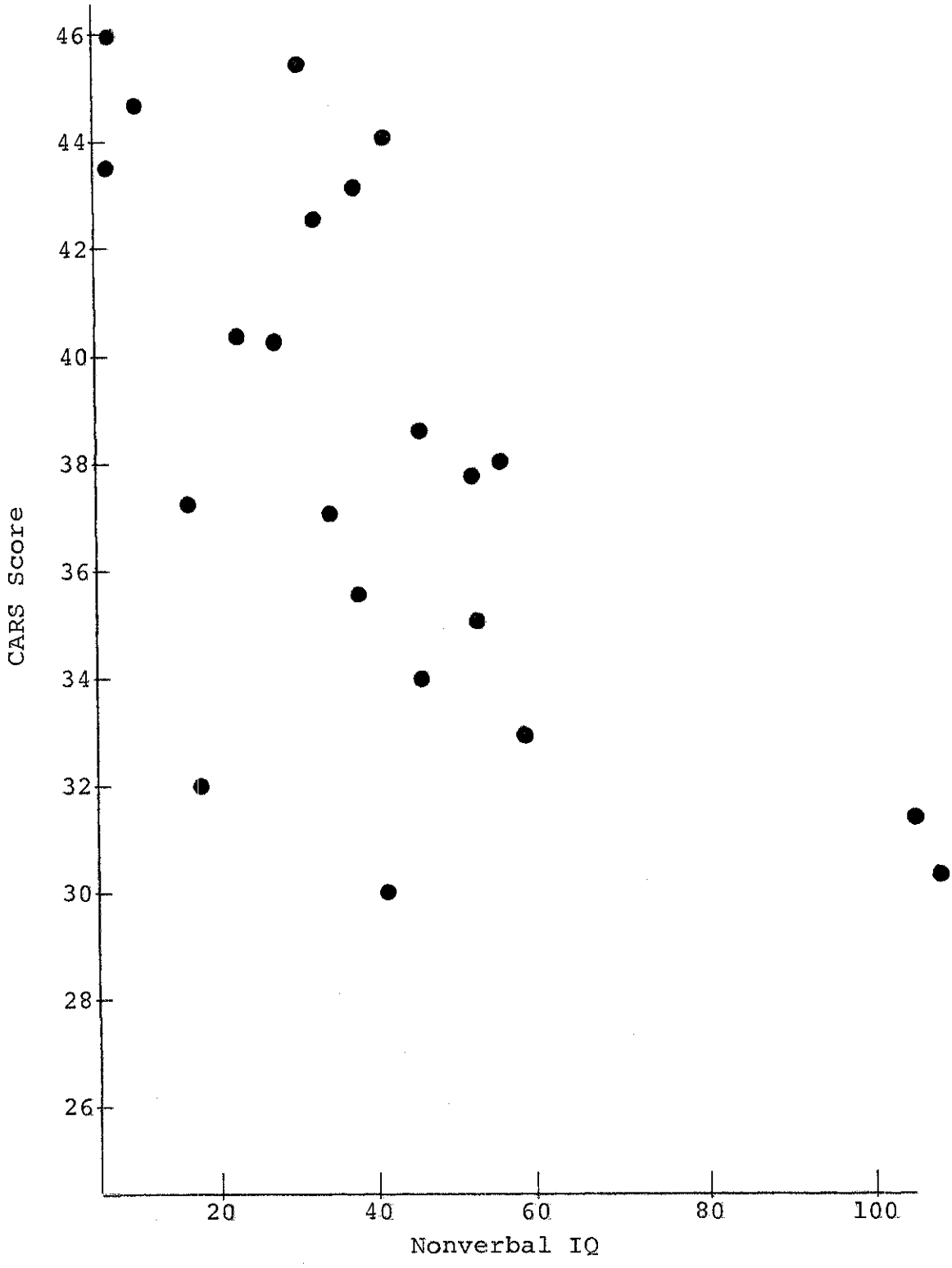

Figure 1. Relationship between children's nonverbal IQ and Childhood Autism Rating Scale (CARS) score

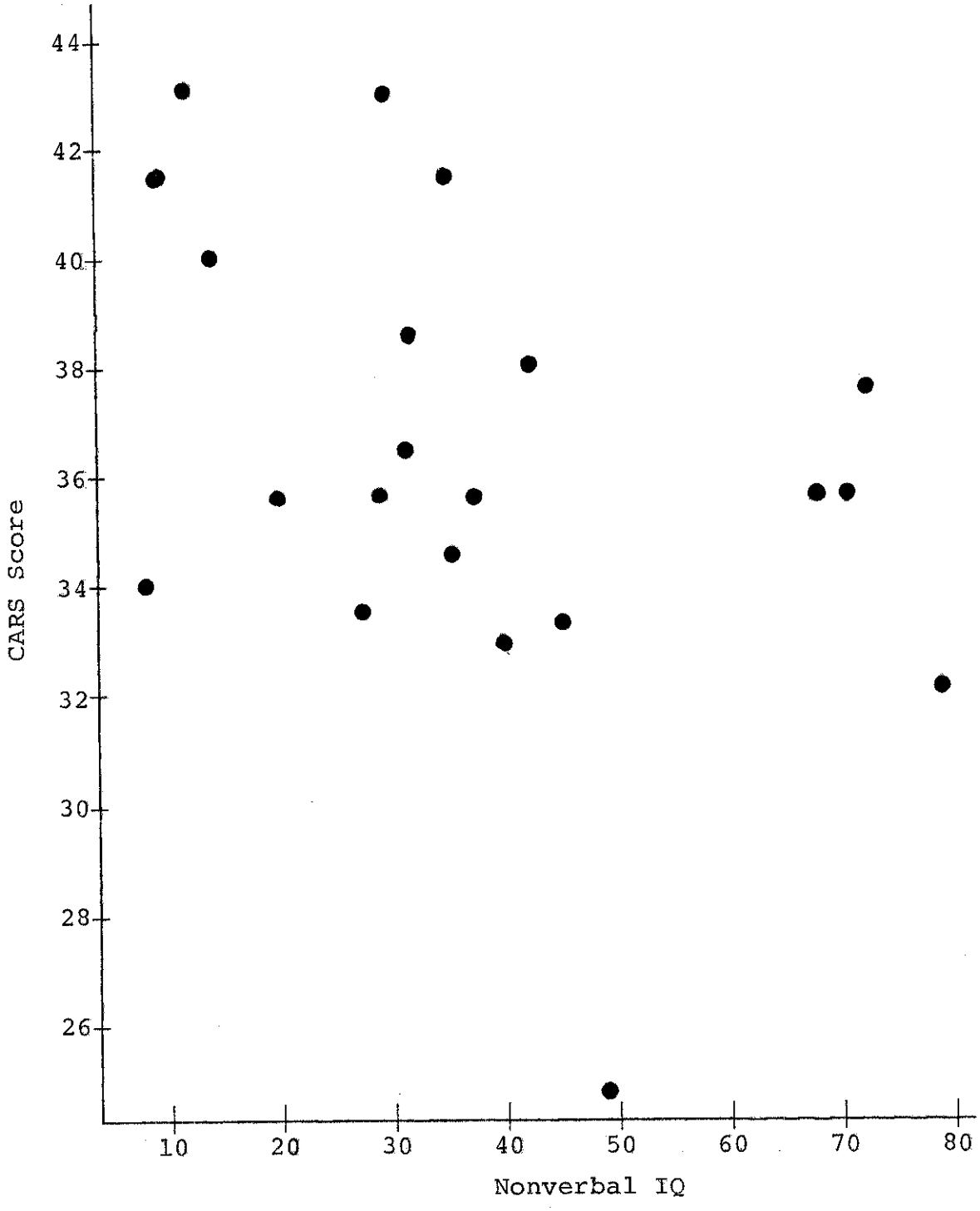

Figure 2. Relationship between adolescent's nonverbal IQ and Childhood Autism Rating Scale (CARS) score.

items with this group, it seems clearly inappropriate for adolescents.

The Overactivity item was a poor one for both groups and probably reflects the variability of activity level among autistic children. Not all autistic children are hyperactive, and those who are may change gradually from hyperactivity in childhood to marked underactivity in adolescence (Ando & Yoshimura, 1979; Rutter, Greenfeld & Lockyer, 1967). The CARS also has an activity level item, but this item takes into account hypoactivity as well as hyperactivity. On the alpha analysis of the CARS the activity item was a reliable one for both groups.

Even elimination of the two weakest items however, may not be sufficient to improve the checklist for use with adolescents. Half of the 14 items were negatively correlated with the total score. The question of what is sufficient reliability for a screening instrument remains to be addressed. With the younger group, two items were negatively correlated with the total score and the alpha of .51 falls short of the recommended levels of .80's and .90's (Anastasi, 1982), but its use here is not as a diagnostic but rather as a screening tool to identify students with a need for further assessment. The question is, are students who should be seen by the autism team being missed by the screening process?

CARS scores were, for the most part, similar in the two age groups. Adolescents did not score significantly lower

than younger children on the scale. The CARS seems to be identifying autism in both groups of identified autistic students, although there is a danger of circular reasoning here since the CARS scores were used as one of the criteria for the diagnosis of autism in the first place. While not the sole criterion, only one adolescent was diagnosed as autistic who had a CARS score below the 30 cut-off point for the scale. None of the younger children had a score below 30.

Reliability of the CARS for both groups appears adequate, although the coefficients of .73 for the adolescents and .79 for the younger group fall slightly short of recommended levels. The CARS appears to be identifying autism in adolescents despite the documented developmental changes which occur. The one item, "Inconsistencies in Intelligence," which was negatively correlated with the total score does not seem to be a problem due to developmental changes, since the effect was seen for both age groups.

The nature of the relationships between IQ and CARS scores was an intriguing and unpredicted result, the meaning of which is not clear. In the younger group, the two scores were significantly negatively correlated, i.e. as measured IQ decreased, severity of autism increased. Other researchers have found a similar pattern using both the CARS (Schopler, Reichler, DeVellis & Daly, 1980) and other assessment methods (Bartak & Rutter, 1976). Among adolescents no such relationtionship existed. Even though the groups were not significantly

different on either variable, the younger group was more variable on both the CARS scores and the IQ scores which may statistically explain the finding. Also, small sample size may be sufficient explanation.

In summary, some important age-related differences were found for both the Prescreening Checklist and the CARS. Developmental changes which occur in autism from childhood to adolescence do not appear to significantly affect the ability of the CARS to identify autism. The Prescreening Checklist however, while it may be useful as a screening tool for young children, appears questionable as such for adolescents. It is possible that autistic adolescents are being missed by the screening process. Study Two was designed to address this possibility by comparing non-autistic handicapped adolescents with autistic adolescents.

Method

Study 2: A Comparison of Adolescent Autistics and Nonautistics: Discriminant Validity

Subjects

Subjects for the second study were 20 autistic adolescents and a matched group of 20 nonautistic handicapped adolescents. All were students in a large metropolitan public school district and had been identified by the districts special education department. The groups were matched on age and IQ, and as closely as possible on sex and ethnicity. Refer to Table 4 for a description of the

Table 4

Subject Characteristics--Study 2

	Autistic Adolescents	Non-Autistic Adolescents
Age (years)		
Range	12-22	13-20
Mean	16.3	15.6
Ethnicity		
Black	13	15
White	3	3
Hispanic	4	2
Sex		
Male	16	17
Female	4	3
IQ		
Range	12-83	10-82
Mean	47.7	47.2
SD	20.9	23.7

two samples. In addition, and in order to make the two groups more closely comparable, the handicapping conditions that had classified the autistic students prior to their identification as autistic were used to match the handicapping conditions of the nonautistic group. The adolescent group was essentially the same as described in experiment one, except for four cases which could not be matched and were dropped

and two additional cases which could be matched and were added.

Available IQ scores were again taken from school records. When possible, a nonverbal measure of intelligence was used for matching. IQ scores for the autistic adolescents were obtained from the Merrill-Palmer (5), the WISC-R performance scale (5), the Leiter (5), the Standord-Binet (1), and the WAIS verbal scale (1). In addition, three children whose records indicated only a classification of trainable mentally (TMR) without a specific score were arbitrarily assigned an IQ of 28, as described in experiment one. Though IQ scores were somewhat higher than the adolescent group in experiment one, with 65 percent below an IQ of 50 and 75 percent below 70, this group is still below the averages reported by Brooker and Mareth (1982).

From computer records on 9,529 special education students, a list was compiled of students matching the adolescent group on prior handicapping condition, sex, age, ethnicity and approximate IQ based on handicapping condition, e.g., TMR and EMR (educably mentally retarded). A letter was sent to these children's parents requesting permission to observe the child and have access to special education files (see Appendix C). From the children who returned a signed permission slip, the best matches were made with IQ having the highest priority, then age, sex, handicapping condition, and ethnicity, in that order. IQ scores were obtained from the WISC-R performance

scale (10), the Stanford-Binet (6), the Slosson (3), and the Leiter (1). In four cases, records indicated only that IQ was below a certain level, e.g., < 32 on the Stanford-Binet and < 45 on the WISC-R. In those cases an IQ score was arbitrarily assigned at a midpoint between the score indicated and zero. In the examples above, scores of 16 and 23 would be used respectively.

One nonautistic student, a severely and multiply handicapped 18-year-old boy, was deemed an outlier and dropped from the study. His CARS score of 46 and his Prescreening score of 14 were both well beyond four standard deviations above the mean for his group.

T-test comparisons revealed that IQ's and ages were not significantly different for the two groups, $t(19) = .21$ and $t(19) = .75$ respectively.

Materials

The CARS and the Prescreening Checklist, as described in study one, were used.

Procedure

Two graduate students were trained to administer the CARS. Training consisted of viewing training tapes (produced by the developers of the CARS) and accompanying qualified personnel as they administered the test. Reliability was computed by correlating the trainee's scores with the CARS score on file with the school system and squaring the correlation. Reliability coefficients were .91 and .90 respectively

for the two students. In addition, reliability between the two students was assessed on an item-by-item basis. A score of one was given if the individual item scores matched within one-half point, and zero if there was a larger discrepancy. The points were totalled and divided by the total number of possible points to give a reliability coefficient. The two raters averaged .89. Once this level of reliability had been established, the two student raters went to the schools, observed the students in the matched nonautistic group, and scored them on a CARS rating form. In addition they obtained a Prescreening Checklist from the students' teachers. The raters were not blind as to the non-autistic status of the students.

Results

Findings relating to the Prescreening Checklist will be reported first, followed by those relating to the CARS. An alpha level of .05 was adopted for all analyses.

There was a significant difference between Prescreening Checklist scores for the two adolescent groups, $t(19) = 10.88$. The mean number of behaviors checked for the autistic adolescents was 7.4, and for the nonautistic group 2.1.

Inter-item reliability for the Prescreening Checklist was assessed by the Kuder-Richardson formula. For the autistic group, the reliability coefficient was -.13. Eight of the 14 items were negatively correlated with the total score, and elimination of no single item would raise the reliability

appreciably above zero (see Table 5). The reliability coefficient for the nonautistic group was .61. This was calculated on 13 items since there was zero variance in the item "Sustained Odd Play" (no student received a check for this item). Five items were negatively correlated with the total score, and elimination of one of them, "No Eye Contact," would raise the reliability coefficient to .68.

For CARS scores, means were 36.1 and 20.5 respectively for the autistic and nonautistic groups, and were significantly different, $t(19) = 13.74$. Scores for the autistic group ranged from a low of 24.5 to a high of 45.5, and for the nonautistic group from 15 (the lowest possible score) to 28.5, still below the cutoff point for a diagnosis of autism.

Alpha coefficients were computed for each set of CARS scores (see Table 6). For the autistic group, the resulting alpha coefficient was .75, and for the nonautistic group, .82. For the autistic adolescents the item, "Inconsistencies in Intelligence," was negatively correlated with the total score and its deletion would raise alpha to .79. For the nonautistic group, the item "Listening Attention" was negatively correlated with the total score, but "Inconsistencies in Intelligence" was a poor item as well; its correlation with the total score was only .06 and its deletion would raise alpha to .84. With a mean of 2.0, it was the highest item mean on the scale for the nonautistic group.

Table 5

Reliability Analysis of Prescreening Checklist--Study 2

Item	Item-total Correlation		Reliability if Item Deleted	
	Autistic	Non-Autistic	Autistic	Non-Autistic
Difficulty in mixing with other children	-.08	.44*	-.10	.55
Acts as deaf	.36	-.09	-.48	.64
Resists learning	.04	.73*	-.18	.48
No fear of real dangers	.36	-.01	-.44	.62
Resists change in routine	.00	.41	-.14	.56
Indicates needs by gestures	-.19	.37	.00	.57
Inappropriate laughing & giggling	.21	.47*	-.28	.54
Not cuddly	-.30	.37	.08	.57
Marked physical overactivity	-.10	-.09	-.06	.64
No eye contact	-.27	-.23	.06	.68
Inappropriate attachments to objects	-.27	-.09	.01	.64
Spins objects	-.14	.50*	-.05	.57
Sustained odd play	.17	++	-.28	++
Standoffish manner	-.12	.55*	-.07	.52

*$p < .05$.

++Zero variance, item not included in reliability analysis.

Table 6

Alpha Analysis of CARS--Study 2

	Item-Total Correlation		Alpha if Item Deleted	
Item	Autistic	Non-Autistic	Autistic	Non-Autistic
Relationships with people	.38	.55*	.74	.80
Imitation	.67*	.23	.70	.82
Emotional responses	.54*	.72*	.72	.79
Use of body	.26	.68*	.75	.79
Relation to objects	.63*	.17	.71	.82
Adaptation to environmental change	.39	.30	.74	.82
Visual attention	.21	.78*	.75	.78
Listening attention	.48*	-.12	.73	.83
Touch, taste, and smell	.24	.25	.75	.82
Fear or nervousness	.40	.47*	.71	.81
Talking	.14	.74*	.76	.78
Pointing and gesturing	.17	.62*	.76	.80
Activity level	.50*	.35	.73	.82
Inconsistencies in intelligence	-.23	.06	.79	.84
General impression	.74*	.47*	.72	.81

*$p < .05$.

A Pearson correlation revealed no significant relationship between IQ and CARS scores for the autistic group, but a significant negative relationship for the two variables in the nonautistic group, $r(18) = -.67$. Scatterplots are similar to those for the two groups in experiment one (refer back to Figures 1 and 2).

Discussion

The results indicate that both instruments, the Prescreening Checklist and the CARS, discriminate well between autistic adolescents and nonautistic handicapped adolescents. As in experiment one, reliability coefficients for the Prescreening Checklist were low, with over half of the items negatively correlated with the total score. It is interesting to note that none of the nonautistic adolescents were checked for the item "Sustained Odd Play." It appears that while the Prescreening Checklist has very low reliability when used with adolescents, it remains a cluster of behavior items that are not descriptive of a nonautistic group of children, hence the discriminability of the measure. Items such as "No Eye Contact," "Spins Objects," and "Sustained Odd Play," while they do not consistently identify autistic adolescents, virtually never apply to nonautistic adolescents. Thus as a screening tool, the Checklist appears to adequately fulfill its intended purpose of identifying students in need of further testing. Inter-item reliability may not be the method of choice for determining the reliability of such a checklist; a measure of

inter-rater reliability might have provided a more reasonable assessment. Since some of the individual items appear inappropriate for use with adolescents, e.g. "Not Cuddly," the school district could consider lowering the cutoff score to assure that autistic adolescents are not being missed in the screening process.

The CARS, on the other hand, was sufficiently reliable with both adolescent groups. Reliability could be improved in both cases with the deletion of the item, "Inconsistencies in Intelligence." This will be discussed further in the general discussion.

Again, as in experiment one, there was the intriguing finding that CARS scores were not correlated with IQ for the autistic adolescents, but were for the comparison group. Interestingly enough, in the second study there was more variability on both measures in the autistic group, but still no significant correlation was found. The meaning of these findings, as mentioned above, is not clear.

The question being addressed in this study was whether autistic adolescents are being missed by the screening and assessment process, and in general, the answer seems to be that they are not. Mean scores for the two groups on both the Prescreening Checklist and the CARS were significantly different, with the autistic group consistently scoring higher. Scores for the nonautistic students were below the cutoff point for the CARS in all cases, and only two cases

were above the cutoff point on the screening instrument. Only one of the autistic adolescents scored below the cutoff point on the CARS, and his prescreening score was an above-average 9. His CARS score of 24.5 overlaps with the nonautistic group's distribution of scores. Otherwise the CARS discriminated between the two groups well, although it should be recalled that raters of the nonautistic group were not blind as to the nonautistic status of these students.

General Discussion

Both studies were concerned with addressing the effects of age-related changes in the autistic child as he or she becomes an adolescent, specifically the effect on assessment instruments designed for younger autistic children. In general, some age-related differences were found and the validity of the CARS was supported for adolescents.

Younger autistic children scored significantly higher on the Prescreening Checklist than did the autistic adolescents, and the internal consistencing of the instrument was strikingly different for the two groups. For autistic adolescents in both studies, half or more of the items were negatively correlated with the total scores. Suggestions were made for lowering the cutoff score for adolescents, and for assessing the reliability of the Checklist by measuring inter-rater rather than inter-item reliability. Despite the limitations of the Checklist, at least among the children in these studies, it does not appear that autistic children are being missed in the screening process.

The CARS appears to be a valid instrument for use with an adolescent population. Although adolescents scored slightly (but not significantly) lower than the younger group, they were still identified as autistic by the scale in all but one case. Furthermore, they scored significantly higher than the matched nonautistic group, thus documenting discriminant validity. The CARS appears relatively insensitive to age-related changes in autistic children. Reliability was acceptable in all groups.

The one weakness in the CARS appears to be in the item "Inconsistencies in Intelligence." This item was unrelated to total scores across all groups. It is interesting that this item reflects one of Kanner's original diagnostic indicators of autism. An explanation of this finding may be in the scoring of the item. On all other items on the CARS, a score of two is associated with a mild degree of abnormality suggestive of autism (a score of two on every item would yield a total score of 30 and a diagnosis of mild autism). On the "Inconsistencies in Intelligence" item, a score of two is designated for mentally retarded children whose abilities are about the same level in all areas of intelligence. Thus, for the nonautistic handicapped group, this item had a mean of two, the highest of any item on the scale, but was not indicating the presence of autism and did not correlate significantly with the total score. The item means for the autistic groups, both adolescents and children, were greater than two,

but were still negatively correlated with the total score (refer back to Tables 3 and 6).

The non-relationship between CARS scores and IQ in the autistic adolescent groups was, as mentioned above, something of a surprise. Intuitively, it seems likely that there would be a negative relationship between the severity of autism and measured IQ, it being difficult to get any IQ score at all in cases of severe autism. In fact, it has been found that severely autistic children formerly believed to be untestable were testable when given items at a lower level of difficulty (Alpern, 1967). Lockyer and Rutter (cited in Rutter, 1978a) likewise found that children initially believed to be untestable due to severe autistic behaviors later behaved the same way as the severely retarded. Findings such as these helped establish that autism and mental retardation can coexist, and later it was observed that the more severe autism, or greater number of autistic symptoms, was associated with the more severe retardation (Bartak & Rutter, 1976; Schopler, Reicher, DeVellis, & Daly, 1980).

Of course this is what was found for the younger autistic group and for the nonautistic adolescent group. Autistic adolescents alone differed from this expected pattern. In examining the scatterplots for the two adolescent autistic groups, one can see a partial trend for the highest CARS scores to also have the lowest IQ. This is offset by a lack of consistency in the middle scores, and none whatsoever in

the lower scores. There appear to be two outliers, one at either end. The student with the highest IQ (83) also had the highest CARS (45.5), and a student with a IQ of 49 obtained the lowest CARS score of 24.5. Nevertheless, the correlation obtained after elimination of these outliers still failed to reach significance.

The major consideration for this finding must be the small sample size; however, there is an alternative explanation in sample selection. The autistic adolescents in this study may not represent all the autistic adolescents in the school district even though they are the only ones identified as autistic. A special education program and classification for autism has only existed in the district for two years. Thus there may be autistic adolescents who have been diagnosed with a different handicapping condition for many years and who have adapted to their classrooms well enough so that they were never referred to the new program. It is conceivable that they would be the higher functioning students, mildly autistic and mildly retarded. Janicki and Jacobson (1980) believed that the same bias may have affected their sample of autistic adults. Such a selection bias could account for the failure to find the expected relationship between IQ and CARS score among the autistic adolescents.

In general, two studies found some age-related changes between younger and older autistic children and obtained evidence for the validity of the CARS in identifying autism

in adolescents. Suggestions were made for better use of the Prescreening Checklist. The unreliability of the CARS item, "Inconsistencies in Intelligence," was discussed in relation to the way the item is scored. Finally, the finding that CARS scores in the autistic adolescent groups were not correlated with IQ scores was discussed in relation to sample size and selection.

Appendix A

Childhood Autism Rating Scale (CARS)

I. RELATIONSHIPS WITH PEOPLE

(1) No evidence of difficulty or abnormality in relating to people. The child's behavior is appropriate for age. Some shyness, fussiness, or annoyance at being told what to do may be observed, but not to a greater degree than typical children of the same age.

(2) Mildly abnormal relationships. The child avoids looking the adult in the eye, may avoid the adult or become fuzzy, may be excessively shy, may not be as responsive to the adult as a typical child of the same age, may cling to parents somewhat more than most children.

(3) Moderately abnormal relationships. The child shows aloofness (seems unaware of adult, at times). Persistent and forceful attempts are necessary to get the child's attention at times. Minimal contact is initiated by the child; contact may have an impersonal quality.

(4) Severely abnormal relationships. The child is consistently aloof or unaware of what the adult is doing; almost never responds to the adult, rarely or never initiates contact or interaction with the adult, only the most persistent attempts to get the child's attention have any effect.

II. IMITATION (verbal and physical)

(1) Age appropriate imitation. The child can imitate sounds, words, and movements appropriate for his or her age.

(2) Mildly abnormal imitation. The child imitates most of the time when asked to, but may require occasional prodding, or may imitate after a delay instead of right after the adult shows what to do.

(3) Moderately abnormal imitation. The child imitates only part of the time or requires a lot of persistence and help from the adult.

(4) Severely abnormal imitation. The child rarely or never imitates either words, or movements.

III. EMOTIONAL RESPONSES

(1) Age-appropriate and situation-appropriate emotional responses. The child shows appropriate responses (pleasure, displeasure and interest), as indicated by change in facial expression, posture and manner.

(2) Mildly abnormal emotional responses. Some responses are inappropriate. The child displays quite inappropriate emotional reactions (either too much or too little emotion). Reactions are often unrelated to the objects or events surrounding them. The child may make strange faces without apparent reason.

(3) Moderately abnormal emotional responses. The child shows definite signs of inappropriate emotional responses. Reactions may be quite inhibited or quite excessive and may be unrelated to the situation. The child may grimace or become rigid, even though no apparent emotion-producing objects or events are present.

(4) Severely abnormal emotional responses. Responses are seldom appropriate to the situation; once the child gets in a certain mood, it is very difficult to change the mood, even though activities may be changed.

IV. USE OF BODY

(1) Age appropriate use of body. When the child moves with the same speed and motor behavior as a normal child of the same age his or her behavior is considered appropriate.

(2) Mildly abnormal use of body. Some minor peculiarities may be present, such as clumsiness, repetitive movements, poor coordination, or the rare appearance of the more unusual movements listed in (3) below.

(3) Moderately abnormal use of body. Behavior that is clearly strange or unusual for children of this age should be noted. These may include strange finger movements, strange postures, staring or picking at the body, hurting himself or herself, rocking, spinning, finger-wiggling or walking on tip-toes.

(4) Severely abnormal use of body. Intense or frequent movements of the type listed in (3) above are signs of severely abnormal body use.

V. RELATION TO OBJECTS

(1) Age appropriate use and interest with toys and in other objects.

(2) Mildly inappropriate interest or use. The child may show less than typical amount of interest in a toy or may

play with it in an inappropriately childish way, such as banging or sucking on the toy or object.

(3) Moderately inappropriate interest or use of objects. The child may show very little interest in objects or may be preoccupied with using an object in some strange way. For example, the child may use an object in a way that is inconsistent with its function, may dangle a string or straw, spin wheels or other parts of objects, focus attention on some insignificant part of a toy, become fascinated with light reflecting off the object, or repetitively move some part of the object or carry around one object ignoring all others.

(4) Severely inappropriate interest or use. The child may do the above more frequently and intently, and is most difficult to distract.

VI. ADAPTATION TO ENVIRONMENTAL CHANGE

(1) Age appropriate response to change.

(2) Mild resistance to change. The child might show some evidence of resistance to change. When an adult tries to change tasks, the child might continue to do the same activity or use the same materials, but the child can be distracted.

(3) Moderate resistance to change. The child actively resists changing activities and becomes angry or unhappy when a change is attempted.

(4) Severe resistance to change. The child shows severe reactions to change that are difficult to eliminate. If a change is forced on the child, he or she may become extremely angry or uncooperative.

VII. VISUAL ATTENTION

(1) Age appropriate visual responses. The child's visual behavior is normal and is appropriate for children of the same age.

(2) Mildly abnormal visual responses. The child must be reminded from time to time, to look at objects. The child may be more interested in looking at mirrors that most children of the same age, or may avoid looking other people in the eye. The child might occasionally stare off into space or stare at lights more often than a typical child of the same age.

(3) Moderately abnormal visual responses. The child must be reminded frequently to look at what he or she is doing, may like to look at shiny objects, may almost never look people in the eye. He or she may stare into space, look at objects from an unusual angle, or hold objects very close to the eyes.

(4) Severely abnormal visual responses. The child consistently avoids looking at people or at certain objects, or shows extreme forms of other visual peculiarities described above.

VIII. LISTENING ATTENTION

(1) Age appropriate listening responses. The child's listening behavior is normal and is appropriate for children of the child's age.

(2) Mildly abnormal listening responses. There may be some lack of response to certain sounds. The child may show different degrees of interest in voices or nonhuman sounds.

The child overacts mildly to some sounds and is occassionally distracted by other sounds.

(3) Moderately abnormal listening responses. Responses to sounds may often vary. The child often ignores a sound the first few times it is made. The child may also be startled by some sounds or cover his or her ears when the sound is made.

(4) Severely abnormal listening. The child either overreacts or underreacts to sounds to an extremely marked degree.

IX. TOUCH, TASTE, AND SMELL

(1) Normal response to pain, smell, taste, or touch. When pinched, or after an accidental bump or fall, the child expresses pain, but does not overreact. The child explores a new object by feeling it (and looking at it). Tasting or smelling may be used if appropriate (for example, if the object looks like it is supposed to be eaten).

(2) Mildly abnormal response to pain, smell, taste, or touch. The child may ignore or overreact to a pinch or something else that would mildly hurt a normal child. The child may persist in putting objects in his or her mouth even though most children of the same age have outgrown this. The child may smell or taste nonedible objects from time to time.

(3) Moderately abnormal response to pain, smell, taste, or touch. The child may show a moderately unusual reaction to pain, either by reacting too much or too little. The child

may be moderately preoccupied with touching, smelling, or tasting objects or people.

(4) Severely abnormal response to pain, smell, taste, or touch. The child is usually preoccupied with smelling, licking, or feeling different objects more for the sensation than as part of the normal use of the objects. The child completely ignores pain or reacts very strongly to something that is only slightly painful or uncomforable.

X. FEAR OR NERVOUSNESS

(1) No excessive fear or nervousness. The child's behavior is appropriate to his or her age and situation.

(2) Mild fear or nervousness. The child shows occasional fear or nervousness that is slightly stronger than the reaction of a normal child of the same age in the same situation.

(3) Moderate fear or nervousness. The child's reactions show quite a bit more fear or nervousness than is typical even for a younger child. It is difficult to comfort the child and to understand what is triggering the fear response.

(4) Severe fear or nervousness. It is extremely difficult to calm the child. Fears persist even after repeated experience with harmless events. Conversely the child may fail to show appropriate regard for hazards, such as strange dogs or heavy traffic.

XI. TALKING

(1) Speech is appropriate for age.

(2) Speech is mildly abnormal. The child may talk the way younger children do, or the child may use some unusual words.

(3) Speech is moderately abnormal. The child does not talk, or mixes normal talking with peculiar talking. Examples of peculiar talking might include speech mixed with phrases from television commercials, baseball scores, and weather reports, echolalia, or using jargon.

(4) Speech is severely abnormal. The child may frequently make infantile sequeals or weird animal-like sounds that have no meaning. Or, the child may consistently use jargon, repeatedly ask the same question with no interest in the answer, or display echolalia.

XII. POINTING AND GESTURING

(1) Use of gestures is appropriate for age.

(2) Use of gestures is mildly abnormal. The child uses gestures in the same way that a younger child would. The child may only point or reach, even though most children of the same age use more gestures to indicate what they mean or what they want.

(3) Use of gestures is moderately abnormal. The child is unable to express needs by using gestures or to understand the gestures of others. He or she may take the adult's hand to lead the adult to a desired object but not point to it. The child may want to be lifted but not reach up his arms to indicate this. The child does not usually follow adult's gestures to come, go, or give or take things.

(4) Use of gestures is severely abnormal. The child uses gestures that are strange or peculiar and that have no meaning and shows no awareness of adult's gestures.

XIII. ACTIVITY LEVEL

(1) Activity level is normal. The child is neither more active nor less active than the normal child of the same age in a similar situation.

(2) Activity level is mildly abnormal. The child may become mildly restless at times or may seem rather lazy and slow-moving. Generally, the child can be encouraged to move about at a more appropriate speed (either to slow down or to speed up).

(3) Activity level is moderately abnormal. The child may be quite active and hard to control or calm down. Or, the child may move slowly, or move very little, requiring a lot of prodding to get him or her to move around. Other children do not tire easily, do not go to sleep readily at night, cannot relax during school rest periods, or are very slow, dislike physical exercise and are often thought of as "very lazy."

(4) Activity level is severely abnormal. The child is extremely active or extremely inactive. The child may go from one extreme to the other. It may be difficult to control the child or to get the child to do anything. An adult may need to control the child's activity level much of the time or give the child medication to sleep at night.

XIV. INCONSISTENCIES IN INTELLIGENCE

(1) Intelligence is normal. The child is as smart as typical children of the same age and does not have any unusual skills or problems as far as intelligence is concerned.

(2) Intelligence is mildly abnormal. The child is not as smart as typical children of the same age and this pattern is about the same for all areas of intelligence.

(3) Intelligence is moderatley inconsistent. In some skills, the child is behind others of the same age but in others, the child is just as smart or possibly smarter than other children of the same age. For example, the child may be like a child of the same age with regard to physical skills, coordination, and remembering routines but be unable to understand much language.

(4) Intelligence is severely inconsistent. The child is less smart in some skills but is definitely smarter than most children of the same age in other skills. For example, the child may not read at all (even though other children of the same age do), but may be able to work with numbers far better than most children or may have special artistic or musical skill. The child may also be able to read and rote count at an early age but have no understanding of what the words mean.

XV. GENERAL IMPRESSIONS

"General Impressions" is intended to be an overall rating of the degree to which you think the child is autistic. Include all information you have available, including observations, parent interviews, history information, or past records.

Appendix B

Autistic Prescreening Checklist

_____ Difficulty in mixing with other children.

_____ Acts as deaf.

_____ Resists learning.

_____ No fear of real dangers.

_____ Resists change in routine.

_____ Indicates needs by gestures.

_____ Inappropriate laughing and giggling.

_____ Not cuddly.

_____ Marked physical overactivity.

_____ No eye contact.

_____ Inappropriate attachments to objects.

_____ Spins objects.

_____ Sustained odd play.

_____ Standoffish manner.

Appendix C

December 10, 1984

To: Parent/Guardian of _____

Dear Parent,

The Special Education staff is studying better ways of identifying children who have special educational needs. To help us with this project, we are requesting permission to observe your child in the classroom and review his/her school records.

A checklist will be used in order to complete our observations. If you would like to see this checklist before giving your permission, please call me. You should understand that your child is not being referred for an evaluation, and none of the information that we gather will go into your child's records. We are just asking for your cooperation and hope that DISD students in the future will be helped by what we learn.

Please sign and return this form in the enclosed stamped envelope. Thank you for your cooperation.

Sincerely,

Ruth M. Turner, Ed.D.
Director, Special Education

I have read the above letter and I hereby give my consent and authorization for the following: classroom observation and review of school records.

_____ _____
Signature to Parent/Guardian Date

Note: This letter was on Dallas Independent School District letterhead.

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