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ABSTRACT

Three studies examined proximity and contact behaviors (behaviors generally thought to be indicative of attachment relationships) in young autistic children. The first study examined the behavior of 32 young autistic children and children with pervasive developmental disorders (PDD) in a "strange situation" paradigm using four interactive subscales (proximity and contact seeking, contact maintenance, contact resistance, and proximity avoidance). Analysis revealed correlates between developmental variables involving chronological age, mental age, and language levels and overall attachment rating. However, no relationships between severity of autism and attachment ratings were found. The second study compared 17 of the original subjects to a matched group of nonautistic children with developmental and behavioral disorders. Frequency and distribution of overall security ratings were similar in both groups. However, the autistic/PDD group, unlike the comparison group, demonstrated significant relationships between overall security ratings and the developmental variables of chronological age, mental age, and language ability. The third study involved a longitudinal study of changes in overall security rating in the autistic/PDD subjects. Preliminary findings suggest that the PDD group demonstrated increases in overall security ratings over an 8-month period of time, as would be expected if developmental variables were contributing to security. It is concluded that forming attachment relationships may involve unique difficulties and processes for young PDD children. (JDD)

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Three Studies of Attachment in Autism

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Abstract

Three studies examined proximity and contact behaviors - behaviors generally thought to be indicative of attachment relationships - in young autistic children. The first study examined the behavior of 32 young autistic and PDD children in the Strange Situation using the standard four interactive subscales and a 5 point Likert-type scale to rate overall attachment. Analysis revealed correlates between developmental variables involving CA, MA, and language levels and overall attachment rating. However, no relationships between severity of autism and attachment ratings were found.

The second study compared a subgroup of the autistic/PDD children to a group of nonautistic children with developmental and behavioral disorders, matched on CA, MA, IQ, and SES. Frequency and distribution of overall security ratings were similar in both groups. However, the PDD group, unlike the comparisons, demonstrated significant relationships between overall security ratings and various developmental variables (CA, MA, language).

The third study involved a longitudinal study of changes in overall security rating in the autistic/PDD subjects. Preliminary findings suggest that the PDD group demonstrated increases in overall security ratings over time, as would be expected if developmental variables were contributing to security. We suggest that forming attachment relationships may involve unique difficulties and processes for young PDD children.

Background

1. Clinical observations of the authors as well as studies from two other laboratories (Sigman and Ungerer, Sigman and Mundy, Shapiro et al) of young children with pervasive developmental disorders during separation and reunion from their caretaker have revealed the presence of some behaviors generally considered indicative of attachment security.

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2. Furthermore, in two comparative studies (Shapiro, Sigman) using separation and reunion paradigm autistic children were not found to differ from young children with other handicapping conditions in terms of presence of behaviors commonly associated with attachment security.

Aims

Study 1. descriptive-to describe behavior of young children with pervasive developmental disorders (PDD) in the Strange Situation.

Study 2. comparative - to compare behavior of young PDD children in the Strange Situation to that of a developmental and clinical comparison group.

Study 3. longitudinal - to examine changes in behavior of young PDD children in the Strange Situation over time.

Measures

Nonverbal IQ and MA. assessed at the time of diagnosis.

- Merrill Palmer Scale of Mental Tests
- Leiter International Performance Scale
- or Bayley Scales of Infant Development Mental Scale
- a ratio IQ was calculated

Language, cognitive, and social developmental ages. from the Early Intervention Developmental Profile and Preschool Profile (Schafer & Moersch, 1981), criterion-based scales covering normal patterns of development across the first 5 years of life.

Childhood Autism Rating Scale (CARS) (Schopler, Reichler, DeVellis, & Davis, 1980). The CARS rates social relationships, imitation, affect, body use, object manipulation, resistance to change, visual, auditory, and near-receptor responsiveness, anxiety, verbal and nonverbal communication, activity level, and intellectual ability. Scores of 30-36 are considered to reflect mild-moderate autism; and over 36 are considered indicative of severe autism. Pearson correlation coefficient among raters was .94 for the overall CARS score, calculated on approximately 50% of the subjects.

Attachment security rating. Attachment behavior was rated from videotapes of mother-child pairs in a modified Strange Situation paradigm using one separation.

Interactive Subscales: The four traditional Ainsworth interactive subscales (Ainsworth et al., 1978) were rated: (1) proximity and contact seeking (PS); (2) contact maintenance (CM); (3) contact resistance (CR); and (4) proximity avoidance (PA).

Classification of overall security: The third author's attempts to apply the A-B-C classification system were not successful, for the autistic children demonstrated disorganized patterns of behavior upon separation and reunion.

For these reasons, a continuous rating system of overall security was developed based on a 5-point scale. After completing ratings on the four subscales, raters assigned a score of 1 to 5 as an overall security score (SEC) to reflect their general clinical judgment of attachment security.

Videotapes were rated by a pair of raters trained by the third author. Raters scored each tape independently and later resolved any scoring differences. Because both the Ainsworth interactive subscales and the five point overall security scale were constructed as continuous, Likert-type scales, inter-rater agreements were calculated as intra-class correlations within and across scoring pairs; this was done to avoid falsely high Pearson correlations that might be obtained by systematic, consistent differences between scoring partners. Correlations ranged from .73 to .86.

OVERALL SECURITY SCALE

- 1 strong and pervasive signs of insecurity (contact resistance or proximity avoidance) in the absence of any signs of security (as defined below); or no signs of either security or insecurity.
- 2 clear signs of insecurity mixed with some low-level or weak indications of security;
- 3 clear signs of both security and insecurity are present and they are approximately equal in strength;
- 4 clear signs of security which are stronger and more consistent than signs of ambivalence or resistance.
- 5 clear signs of security, even if brief, with no indications of contact resistance, proximity avoidance, or ambivalence. Primary signs of security include immediate positive response to mother's return; proximity seeking, contact seeking, and contact maintenance during reunion consistent with level of distress seen during separation; resumption of distance/verbal interaction with mother without delay. Secondary signs of security included affective brightening at reunion, requests that mother not leave, search for mother, dampened affect or play during separation.

Study 1 Descriptive Study of Behavior of Young PDD Children in the Strange Situation

Hypotheses:

1. Behaviors indicative of some kind of attachment relationship with their mothers will be observed in many of these subjects.
2. Severity of autistic symptoms will be related overall security score.
3. Developmental variables will be related to overall security score.

Subjects: 32 children (25 male, 7 female) referred to a day treatment program. 21 children diagnosed with autism and 11 with PDD, by two independent child psychologists/child psychiatrists using DSM-III or DSM-III-R criteria and CARS scale scores. The two diagnostic groups did not differ significantly on MA, IQ, SES, and age of symptom onset so the groups were combined.

Description of subjects. (N = 32)

Variable	Mean	S.D.
Chronological age/months	46.34	(11.53)
IQ	72.25	(20.77)
Mental age/months	33.85	(12.57)
Language level/months	22.24	(13.54)
Social level	28.77	(13.53)
CARS	36.53	(7.40)
Majority/minority	20/12	
Hollingshead SES	3.2	(1.2)

Procedures: Diagnoses were made and all measures were administered at the time the subjects were accepted into a day treatment program.

Results

Does the Overall Security Rating System Appear to Reflect Attachment Behaviors as Measured by the Interactive Subscales?

Overall security score was significantly correlated with each of the subscale scores. Furthermore, the mean correlation between the overall security score and the interactive subscale scores was .57, while the mean correlation among the four interactive subscales was .42. Thus the overall security score was felt to reflect the behaviors rated on the interactive subscales.

Correlations of the overall security score with the four interactive subscale scores.

	PS	CM	CR	PA
Overall security score	.56**	.39*	-.62***	-.73***
PS		.77***	-.14	-.72***
CM			-.12	-.49**
CR				.27

* p<.05

** p<.01

***p<.001

Did some subjects demonstrate evidence of security?

The subjects were fairly even distributed across the five points of the overall security ratings. Half the subjects scored a 1 or 2, the other half a 3,4, or 5.

Frequency of overall security scores

- 1 strong signs of insecurity, no evidence of security OR no signs of security or insecurity; N = 6
- 2 clear signs of insecurity mixed with some signs of security N = 10
- 3 clear signs of both insecurity and security present and of equal strength N=4
- 4 clear signs of security that are stronger and more persistent than signs of insecurity N=5
- 5 clear signs of security with no evidence of insecurity N=7

Were some subjects "unattached"?

On the overall security rating system, no child who received a 1 was clinically described as appearing "unattached", or lacked any signs of security or insecurity. All children scoring 1 had clear evidence of contact resistance or proximity avoidance and thus presented some evidence of insecure attachment.

On the interactive subscales, only 2 out of 32 subjects demonstrated scores of 1 or 2 on all four subscales, indicating very little proximity or contact seeking or maintenance, or avoidance or resistance, towards their mothers during reunion. However, in rating secondary signs of security, both children demonstrated a variety of other indicators of attachment security (affective brightening, eye contact, positive affect, increased animation) resulting in clinical overall security ratings of 3 and 4 for those two children. Thus, no subject appeared "unattached", or indiscriminate, towards the mother.

Relationships between severity of autism and signs of attachment security

No relationship was found between CARS scores and overall security rating ($r = .18$, $p = ns$.)

No significant relationship was found between interactive subscale scores and CARS (PS: $r = -.20$, $p = ns$; CM: $r = -.30$, $p = .10$; CR: $r = .31$, $p = .09$; PA: $r = .16$, $p = ns$). Thus, severity of autism as measured by the CARS did not appear related to the presence of signs of attachment security in these subjects.

Relationships between developmental variables and signs of attachment security.

Overall security rating was significantly correlated with MA, CA and language level, and demonstrated a trend towards significance with social level. No relationship was observed with IQ or SES.

Correlations between overall security score and various developmental variables for 32 PDD subjects.

	MA	CA	IQ	SES	LANG	COG	SOC
Overall Security Score	.49**	.48**	.26	.14	.39*	.35+	.34+

+ $p < .10$

* $p < .05$

** $p < .01$

All the developmental variables were also highly intercorrelated. Second-order partial correlations of MA, CA, and language level were run with overall security rating. With the other two variables partialled out, no one variable continued to demonstrate a significant relationship with overall security score (MA; $r = .06$; language: $r = .08$; CA: $r = .31$). Thus, it may be best to think of these three variables together as reflecting overall developmental maturity.

Study 2 Comparative Study of Young PDD Children and Young Children with other disorders of behavior and development in the Strange Situation

Hypotheses:

1. PDD subjects, because of their severe social impairments, would demonstrate significantly greater levels of insecurity than the comparison subjects.
2. Both groups would demonstrate predominantly insecure behavior in the Strange Situation
3. Attachment security would be related to developmental variables in the PDD group but not in the comparison group.

Subjects: 17 subjects from Study #1 were matched to 17 children without PDD but with other psychiatric diagnoses (Reactive Attachment Disorder, Oppositional Disorder, Attention Deficit Disorder, Adjustment Disorder) and developmental delays on CA, MA, IQ, and SES.

Description and comparisons of the PDD and comparison groups of subjects (N=17 for each group).

	Non-Autistic Group X (SD)	Autistic Group X (SD)	t(32)
Chronological age/mnths	50.8(11.0)	47.6(10.2)	0.86
Mental age/mnths	43.4(14.3)	39.1(10.0)	-1.00
IQ	84.8(20.1)	82.7(18.1)	-0.32
CARS	22.8 (8.0)	34.9 (6.5)	4.58***
SES	2.1 (1.5)	2.7 (1.0)	1.43
LANGUAGE LEVEL/mnths	37.4(17.8)	24.6(12.9)	-2.18*
SOCIAL LEVEL/mnths	42.9(11.5)	31.4(13.1)	-2.55*
COGNITIVE LEVEL/mnths	40.4(11.6)	27.1(9.0)	-3.49**
SEX (M:F)	16:1	14:3	
RACE (maj:min)	13:4	9:8	

- * p < .05
 ** p < .01
 ***p < .001

Procedures: All measures were administered to the subjects at the time of their admission to a day treatment program.

Results

Does the Overall Security Score Reflect Similar Relationships to the Interactive Subscale Scores for Both Groups?

The overall security score was significantly related to three of the four interactive subscale scores for both groups, and the size of the correlations did not differ across the two groups. Thus, the overall security score was felt to be an adequate reflection of the behaviors rated on the interactive subscale scores.

Table. Correlations among the overall security scores and the four interactive subscale scores.

	PDD Group			
	PS	CM	CR	PA
Overall security score	.65**	.31	-.70**	-.75***
PS		.82***	-.52*	-.60**
CM			-.28	-.39
CR				.53**
	Comparison Group			
	PS	CM	CR	PA
Overall security score	.63**	.35	-.51*	-.89***
PS		.75***	-.29	-.82***
CM			-.11	-.51*
CR				.43

DID the PDD Group Demonstrate More Evidence of Insecurity than the Comparison Group?

T test comparisons revealed no differences between the two groups on any of the four interactive subscale scores or on the overall security score. Furthermore, a chi square analysis revealed no differences in the two groups on distribution of subjects among the five overall security scores (χ^2 [df=4, n=34] = 1.53, p=.82).

Comparisons of the PDD and comparison groups on the five attachment ratings: overall security score and the four interactive subscale scores.

	PDD Group	Compar. Group	t(32)
Overall security score	3.2 (1.4)	3.1 (1.4)	.12
PS	2.7 (1.7)	2.8 (1.9)	-.14
CM	2.3 (1.6)	2.2 (1.8)	.30
CR	2.7 (1.8)	2.8 (2.0)	-.23
PA	3.3 (1.6)	3.0 (1.5)	.60

Were both groups predominantly insecure in the Strange Situation?

The mean overall security ratings for both groups was approximately 3. Thus, on the average, both groups demonstrated signs of both security and insecurity that were approximately equal in strength.

What were the relationships between signs of security and developmental variables?

The two groups demonstrated differences in the extent to which signs of security were related to developmental variables. For the PDD group, overall security score was significantly related to cognition and language scores and demonstrated trends towards significance with chronological and mental age. NO such relationships existed for the comparison group.

Correlations between overall security score and independent variables for PDD and comparison groups.

PDD Group

Overall security score	CA	MA	IQ	CARS	COG	LANG	SOC
	.41+	.42+	.14	-.26	.57*	.59**	.38

Comparison group

Overall security score	CA	MA	IQ	CARS	COG	LANG	SOC
	.12	.26	.39	.15	.01	.29	.01

+ p<.10

* p<.05

** p<.01

Study 3 Preliminary Longitudinal Study of Behavior of PDD Children in the Strange Situation

Hypotheses:

1. Behaviors indicative of attachment security will increase over time, due to their association with developmental variables.
2. Those subjects scoring at the more secure end of the scale at Time 1 will remain stable at Time 2; those at the insecure end at Time 1 will move upward at Time 2.
3. Developmental variables will be associated with attachment security at Time 2.

Subjects: Twenty two PDD subjects from Study 1 had a second set of attachment data gathered approximately 8 months after the first set and made up the subject pool for this study.

Description of 22 PDD subjects in the longitudinal study.

	Time 1	Time 2
Diagnosis	16 IA, 6 PDD	
Sex	16 male, 6 female	
CA in months	46.18 (12.02)	54.45 (11.38)
MA in months	34.18 (13.25)	40.26 (14.56)*
IQ	72.91 (20.91)	72.91 (20.91)*
Language level	21.36 (14.29)	25.09 (15.34)
Cognitive Level	26.62 (10.31)	32.90 (11.06)
Social Level	26.69 (13.42)	32.48 (12.30)
CARS	37.87 (7.18)	
SES (Hollingshead)	3.27 (1.08)	

*extrapolated from Time 1 data

Procedures: All measures were administered at the time of admission to a day treatment program. In addition, the attachment measures and the cognition, language, and social measures were readministered approximately 8 months later and scored by a separate scoring team who achieved reliability on the attachment measures.

Results

Did indicators of attachment security increase over time?

To answer this question, first the group mean was examined. Mean overall security score of the group at Time 1 was 3.09; at Time 2 was 3.50 ($t(21) = -1.16, p=ns$).

Next, the proportion of the group scoring 1 or 2 and the proportion of the group scoring 3,4,5 was examined. At Time 1, 9

of 22 subjects scored 1 or 2; at Time 2, 3 of 22, a change in proportion which achieved statistical significance ($Z = 3.00$, $p < .01$). Likewise, at Time 1 13 of 22 subjects scored in the 3,4,5 group. At Time 2, 19 of 22 subjects scored 3,4, or 5, a change in proportion which achieved statistical significance ($Z = 3.0$, $p < .01$).

Did the subjects scores at Time 2 fit the hypothesis regarding stability versus direction of change?

More secure subjects: The scores of 13 Subjects who received an overall security score of 3, 4, or 5 at Time 1 were examined. 12 of those 13 subjects, or 92%, remained in the 3,4,5 range at time 2, evidencing some stability. Based on chance alone, 60% of those subjects ($n=8$) should score a 3,4, or 5 at Time 2, resulting in a statistically significant difference ($Z = 2.29$, $p(2\text{ tailed}) < .05$).

Less secure subjects: The scores of the 9 subjects who received an overall security score of 1 or 2 at Time 1 were examined. Based on chance alone, it was predicted that 60% of those subjects ($n=5$) should score a 3,4, or 5 at Time 2. In fact, 7 of those 9 subjects, or 78%, moved into the 3,4,5 range at Time 2. Thus, while they moved in the predicted direction, we cannot rule out chance as accounting for change.

Thus, those initially more secure stayed more secure. Those initially more insecure moved towards increased security, but chance cannot be ruled out.

Do developmental variables continue to be associated with more signs of security at Time 2?

Correlations between overall security score and developmental variables continue to demonstrated significant relationships at Time 2, although not all variables maintain the same relationships to overall security score that were demonstrated at Time 1.

Correlations between overall security score and developmental variables at Time 1 and Time 2 ($N=22$).

Time 2	CA	CARS	MA	IQ	COG	LANG	SOC
Overall security score	.22	-.13	.40*	.40*	.37*	.23	.34+
Time 1	.45*	.18	.37*	.16	.35+	.52**	.48*
Overall security score							

(1 tailed tests used due to prediction that security score and developmental variables are positively related).

Summary

These studies, taken together, provide further support for earlier findings regarding the presence of some behaviors indicative of attachment security in a group of young PDD subjects. In addition, they provide support for earlier findings which demonstrate that young autistic or PDD children are not more likely to be unattached or more insecure than clinical comparison groups.

Finally, these studies have demonstrated a significant relationship between developmental maturity and signs of attachment security. This finding was demonstrated both in the cross-sectional analyses and in the longitudinal analyses which revealed an apparent developmental shift towards more signs of security over time.

Further lines of study are needed in the following areas: validity of the 5 point scale, comparison of the 5 point scale to traditional A-B-C ratings, developmental aspects of attachment security in nonhandicapped infants and in mentally retarded subjects, replication of present findings, identifying maternal-child interaction patterns associated with attachment security within this clinical group.

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