

Loneliness and Friendship in High-Functioning Children with Autism

Nirit Bauminger and Connie Kasari

Loneliness and friendship were examined in 22 high-functioning children with autism and 19 typically developing children equated with the autistic children for IQ, CA, gender, mother's education, and ethnicity. Children between the ages of 8 and 14 were asked to report on both their understanding and feelings of loneliness and the quality of their friendship. Compared to typically developing children, children with autism were both lonelier and had less complete understandings of loneliness. Although all children with autism reported having at least one friend, the quality of their friendships was poorer in terms of companionship, security, and help. Fewer associations were found between loneliness and friendship for the autistic than for the non-autistic children, suggesting less understanding of the relation between loneliness and friendship. Implications of these results are discussed for conceptualizing the social deficits in autism.

INTRODUCTION

Loneliness is an undesirable feeling associated with negative affect (Margalit, 1994). Feelings of loneliness may result from an unfulfilled desire to have friends, an understanding of the gap between an actual and desired social status, and a lack of affective bonding (Asher, Parkhurst, Hymel, & Williams, 1990; Peplau & Perlman, 1982; Perlman & Peplau, 1982; Weiss, 1973). Thus, loneliness is a complex emotion that is heavily dependent on peer influences.

Theoretical formulations of loneliness suggest two basic forms, emotional and social-cognitive (Weiss, 1973). Emotional loneliness represents the subjective responses to the lack of affective bonding with particular others, leading to sadness, fear, restlessness, and emptiness. Social-cognitive loneliness is based on cognitive processes such as self-evaluation, self-perception, and social comparison. Social-cognitive loneliness arises when children perceive their social relationship as unsatisfactory, or when they do not have accessible social networks or peer groups. Unlike the sadness or emptiness arising from emotional loneliness, social-cognitive loneliness gives rise to feelings of exclusion, meaningless, marginality, and boredom (Weiss, 1973). School-aged children understand both forms of loneliness, that associated with being alone (i.e., without an accessible social network) and that linked with being sad (e.g., Asher et al., 1990; Asher & Wheeler, 1985; Cassidy & Asher, 1992; Renshaw & Brown, 1993).

Although neither form of loneliness has been systematically explored in autistic children, both have been the subject of speculation in clinical reports. In 1943, Kanner described a series of children who were content to play for hours with objects, had few relationships with others, and were observed to move among other children "like a strange being, as one

moves between the pieces of furniture" (p. 241). Kanner suggested "a powerful desire for aloneness" (p. 249) in these children. A desire for aloneness or solitude, however, is distinct from loneliness. Solitude, when an individual deliberately chooses to be alone or to play by him or herself, is associated with a pleasant, positive, and sometimes even desirable situation (Margalit, 1994). Altogether, it is not clear if autistic children are satisfied with their aloneness, as suggested by Kanner, and thus do not feel lonely, or if they indeed feel lonely and desire involvement in social relationships. Such a distinction is critical given the debate as to whether the nature of the disorder itself is affective or cognitive.

Both emotional and social-cognitive loneliness are relevant to the study of autism. Because loneliness is linked to a basic ability to *know* about relationships and to *feel* and experience emotions vis-à-vis this knowledge, the study of loneliness may contribute to the debate as to whether autism is a disorder of underlying cognitive processes or a disorder of basic, underlying affective or emotional processes (Baron-Cohen, 1991; Hobson, 1989; Kanner, 1943).

Specifically, the two central views about the understanding of the core deficits in autism lead to different predictions about the feelings and understanding of loneliness in children with autism. The cognitive approach to autism would predict that specific cognitive deficits associated with children's inability to understand others' thoughts and reason about social situations will result in limited understanding of the social-cognitive form of loneliness (e.g., Bishop, 1993; Leslie, 1994; Leslie & Roth, 1993; McEvoy, Rogers, & Pennington, 1993; Ozonoff, Strayer, McMahon, & Filloux,

1994). This prediction arises because social-cognitive loneliness is heavily dependent on children's cognitive ability to compare their social experiences to the social experiences of other children. The child then perceives a *gap* between his actual and desired social status.

In contrast, the affective theory views autism as a biological disorder of affective engagement and relatedness with others (Hobson, 1993; Kanner, 1943). According to this approach, autistic children lack the basic ability to experience relationship-based emotions. The affective theory of autism would predict difficulties in understanding the emotional aspect of loneliness, for the emotional aspect of loneliness reflects the child's need for affective bonding.

Several questions thus arise. Do autistic children feel lonely or are they simply loners? Do they understand both emotional and cognitive aspects of loneliness? How does their understanding of a "friend" and the quality of their friendship relate to their understanding and feelings of loneliness?

To determine if autistic children experience loneliness, it is necessary to determine if they have friends. Unlike most typical children, children with autism may have limited experiences with peers, and may also be less able to understand the meaning of friendship. Hobson (1993) argues that in order to know what persons are, one needs to experience and understand the kinds of relationships that can exist between oneself and others—specifically, reciprocal relationship based on feelings. He suggests that autistic individuals may "stand outside social relationships and merely watch behaviors" (p. 5), thereby failing to grasp the concept of friendship. This lack of intersubjective sharing with others may result in an inability to comprehend what it means to have or to be a friend. In contrast, other theorists argue that an inability to comprehend what a friend is results from basic cognitive deficiencies, most notably a lack of understanding that others have minds, feelings, and thoughts independent of one's own (Baron-Cohen, 1991). Therefore, understandings of friendship are also relevant to the cognitive and affective debate in the field of autism.

This study explores the constructs of loneliness and friendship in children with autism. Children's conceptions and understandings of loneliness and friendship are examined through direct interviews with children. Self-report measures are also utilized to examine children's ratings of loneliness and the quality of their friendships. This study includes only high-functioning children with autism, thus differentiating deficits unique to autism from those associated with mental retardation.

METHOD

Participants

Participants included 22 high-functioning children with autism (1 girl) between the ages of 7 year, 11 months and 14 years, 8 months; and 19 typical children (1 girl) between the ages of 7, 8 and 14, 5. Full-scale IQ scores ranged from 84 to 138 for autistic children, as measured on the WISC-R (Wechsler, 1974), and from 92 to 129 for typical children. This sample includes mainly boys, for two reasons: First, autism is more common among boys (sex ratio 5:1 boys:girls; Baird & August, 1985; Lord & Schopler, 1987; Volkmar & Cohen, 1994; Volkmar, Szatmari, & Sparrow, 1993), and second, when girls are affected, they are much more likely to be *severely* retarded (Tsai & Beisler, 1983; Volkmar et al., 1993; Wing, 1981), so the ratio of boys to girls is expected to be even higher among high-functioning children.

The children with autism were recruited from the UCLA Neuropsychiatric Institute and local regional centers. Typical children were recruited from local public schools, and matched to the sample of autistic children on chronological age, IQ, gender, mother's education, and ethnicity.

Prior to participating in the study, children with autism were diagnosed by licensed psychologists and psychiatrists not associated with the current study. All autistic children met the criteria for autistic disorder as described in *DSM-IV* (American Psychiatric Association, 1994), including (1) onset prior to 36 months of age; (2) qualitative impairment in social interaction; (3) qualitative impairment in communication (e.g., deficits or abnormalities in language development or deficits in play, particularly symbolic play); and (4) restricted and repetitive stereotyped behaviors, which may include bizarre responses to various aspects of the environment, such as resistance to change.

The Autism Diagnostic Interview—Revised (ADI-R; Le Couteur et al., 1989; Lord, Rutter, & Le Couteur, 1994) was administered to parents of the children with autism to verify diagnosis and to provide additional information about the children's developmental and current histories. The ADI-R is a standardized investigator-based interview. Based on the International Classification of Diseases (ICD-10; World Health Organization, 1990) criteria for autism, the ADI-R is based on detailed descriptions of behaviors that focus on developmental deviance rather than on developmental delay. The ADI-R focuses on criteria for autism in three main areas: reciprocal social interaction; communication and language; and repetitive, restrictive, and stereotyped behaviors. The child also must

Table 1 Sample Characteristics

	Autism	Typical
Chronological age (in years, months)		
Mean (SD)	10.74 (2.14)	10.89 (2.10)
Range	7,11–14,8	7,8–14,5
Full-scale IQ		
Mean (SD)	108.14 (15.09)	115.73 (9.75)
Range	84–138	92–129
Verbal IQ		
Mean (SD)	107.22 (15.08)	114.84 (11.03)
Range	78–132	91–129
Performance IQ		
Mean (SD)	108.27 (16.16)	113.68 (9.93)
Range	73–141	94–129
Male/female	21/1	18/1
Ethnicity (White/ African American)	21/1	18/1
Mother's education (M/SD)	6.73 (1.20)	7.00 (.88)

Note: No significant differences between groups on chronological age, verbal IQ, performance IQ, full-scale IQ, mother's education, or gender. IQ scores are based on the WISC-R (Wechsler, 1974). Mother's education was calculated according to an 8-point scale: 1 = less than 7th grade; 2 = junior high; 3 = some high school; 4 = high school; 5 = some college; 6 = special training after high school; 7 = college; 8 = graduate/professional training.

show evidence of developmental delay or deviance prior to the age of 36 months (Le Couteur et al., 1989). All 22 children with autism had displayed evidence of developmental delay prior to 36 months. Eighteen children met all four criteria of the ADI-R and the remaining 4 children met three out of four criteria.

As shown in Table 1, the control group of typically developing children was matched to the children with autism on chronological age; full-scale, verbal, and performance IQ scores; gender; ethnicity; and mother's education. Students *t* tests revealed no differences among groups with regard to any demographic variables.

Measures and Coding Procedures

Loneliness. The Loneliness Rating Scale (Asher, Hymel, & Renshaw, 1984) is a standardized self-report assessing children's global feelings of loneliness. The questionnaire contains 24 items rated on a 5-point scale from not true at all (1) to always true (5). Sixteen items focus on feelings of loneliness and social dissatisfaction (e.g., "I have nobody to talk to in class"; "I don't have any friends in class"; "I feel alone at school"). An additional 8 items are fillers covering hobbies, interests, and school subject preferences. The child obtains a total loneliness score based on the 16

items (*range* = 16–80). The higher the score, the lonelier the child.

There is considerable evidence that the loneliness self-report is psychometrically sound with typical children from kindergarten through middle childhood (e.g., Asher & Wheeler, 1985; Cassidy & Asher, 1992; Renshaw & Brown, 1993) as well as with atypically developing children (e.g., for mental retardation, Williams & Asher, 1992; Luftig, 1988; for learning disabilities, Margalit & Levin-Alyagon, 1994). This instrument has been shown to be internally consistent ($\alpha = .90$) and stable across a 12-month time frame (Asher & Wheeler, 1985; Cassidy & Asher, 1992).

In addition to the self-report scale on loneliness, children were asked to define loneliness ("Can you describe what lonely means?") and to provide an example of a time they felt lonely. Following Cassidy and Asher's (1992) procedure, children's definitions of loneliness were coded on two dimensions: (1) The affective domain assessed whether the child indicated that loneliness includes being sad, afraid, or depressed (corresponding to emotional loneliness); and (2) the social-cognitive domain assessed whether the child indicated that loneliness involves unfulfilled relationships, exclusion, and dissatisfaction from social relationships (corresponding to social-cognitive loneliness). The child obtained a score of 2 if both affective and social-cognitive dimensions were included, a score of 1 if only one dimension was mentioned, and a score of 0 if neither dimension was stated. This measure was successfully used with learning-disabled children and with mentally retarded children in an age range similar to that of subjects in the current study (Margalit & Levin-Alyagon, 1994; Williams & Asher, 1992).

Children's examples of an experience of loneliness were analyzed using a modified version of the system developed by Seidner, Stipek, and Feshbach (1988). The examples given by the children were coded according to the following dimensions: (1) locus of control—whether the event was internal (e.g., "I don't know how to make friends, therefore I'm very lonely during recess") or external (e.g., "I'm lonely at school because the other children are mean"); (2) the presence of an audience (e.g., "One day I was standing by myself while the other boys were playing together, then they stared at me and I felt very lonely") or absence thereof (e.g., "I'm usually lonely at school"); and (3) general versus specific example. General responses include those referring to a broad type of experience (e.g., "I feel lonely when I am by myself") and specific examples include those indicating the child had a particular experience in mind (e.g., "Yesterday afternoon when no one was at home"). Data were categorical with a score of 0 assigned to an external

locus of control, absence of an audience, and a general example. A score of 1 was assigned to an internal locus of control, presence of an audience, and a specific example. Previous studies have successfully used this instrument with both typically developing children and high-functioning children with autism in the same age range as that of subjects in the current study (Capps, Yirmiya, & Sigman, 1992; Seidner et al., 1988).

Interrater reliability was determined by two raters who independently coded randomly selected responses of the children. Generalizability coefficients were calculated on 25% of the sample, evenly distributed across typical and autistic subjects. The generalizability coefficient is considered superior to many reliability indices because it considers multiple sources of error variance simultaneously (Algina, 1978; Mitchell, 1979). G-coefficients approach 1.00 only when the variance associated with subjects is large and the variance associated with raters is small. G-coefficients above .50 indicate adequate reliability (Mitchell, 1979). G-coefficients of 1.00 were obtained for both the affective and social-cognitive categories of the loneliness definition. G-coefficients for each of the dimensions on the examples of loneliness were .89 for locus of control, 1.00 for inclusion of an audience, and 1.00 for the dimension of general versus specific examples. The disagreements on locus of control were discussed until the raters reached consensus.

Friendship. The Friendship Qualities Scale (Bukowski, Boivin, & Hoza, 1994) is a self-report that assesses children's perception of the qualities of their friendships with a best friend. At first the child is asked to nominate his best friend(s). The child is then told to answer the questions on the questionnaire in reference to the relationship he has with his best friend. The questionnaire contains 23 items rated on a 5-point scale from 1 (not true at all) to 5 (very true). The 23 items reflect five categories of friendship qualities: *companionship* (e.g., "My friend and I spend all our free time together"); *security-intimacy and trust* (e.g., "If there is something bothering me I can tell my friend about it even if it is something I cannot tell to other people"); *closeness*—a reflection of affective bond and appraisal (e.g., "I think about my friend even when my friend is not around"); *help* (e.g., "My friend would help me if I needed it"); and *conflict* (e.g., "My friend and I can argue a lot"). Companionship and conflict include four items in each category; security, closeness, and help dimensions include five items in each category. Scores were calculated using the mean score in each category. Using Cronbach's α , the internal reliability of each subscale was examined using two different samples. Sample 1 consisted of fifth- and sixth-graders, and Sample 2 consisted of

fifth-, sixth-, and seventh-graders. All subscales for both samples yielded Cronbach's α coefficients between .71 and .86 (Bukowski et al., 1994).

Procedures assessing children's definitions of friendship were similar to those used to assess children's understanding of loneliness. Children were asked to respond to the question, "Can you tell me what a friend is?" Responses were scored according to three criteria: *companionship* (e.g., "A friend is someone you can play with"); *intimacy* (e.g., "A friend is someone you can share secrets with"); and *affection* (e.g., "A friend is someone who cares about you"). Children obtained a score for the number of dimensions included in their definitions, ranging from inclusion of all three dimensions for a score of 3 to none of the dimensions for a score of 0. Using 25% of all of the children's responses, reliability between two raters yielded generalizability coefficients of 1.00 for each of the three dimensions.

Parent reports of autistic children. Mothers were asked to report on the number of friends their autistic child had. Mothers were also asked what types of activities their child engaged in when playing with friends, and how often their child had scheduled play dates.

Procedure

The data were collected individually for each child. For the autistic group, assessments took place in a laboratory setting on the UCLA campus. Measures were obtained in a separate classroom free of interference and distractions. While autistic children were being assessed, their mothers were interviewed using the ADI-R. The majority of typical children were assessed in their homes. All mothers were asked to fill out demographic information forms during the visit.

RESULTS

Loneliness

The first set of analyses focused on the child's understanding of the concept of loneliness. Analysis of variance (ANOVA) with group as the independent variable and total loneliness definition score as the dependent variable revealed that compared to typical children, autistic children were significantly less likely to provide a complete definition of the concept of loneliness, $F(1, 39) = 7.5, p < .01$. Only 30% of the autistic children, compared to 73.7% of the typical children, could give a definition of loneliness that involved both the affective and social-cognitive dimensions, $\chi^2(2, n = 41) = 8.91, p < .01$.

Analyses next examined the percentages of children

in each group who provided definitions with the affective dimension only and with the social-cognitive dimension only. Thirty-two percent of the autistic children included the affective dimension in their definition of loneliness, as compared to 73.7% of the typical children, $\chi^2(1, n = 41) = 7.15, p < .01$. In contrast, no significant differences were noted in the percentages of children who provided the social-cognitive dimension in their definitions of loneliness (86.4% autistic children versus 94.7% typical children, Fisher exact test, *NS*).

The second set of analyses concerned subjects' accounts of times they felt lonely in terms of three dimensions: (1) locus of control (internal versus external), (2) the presence of an audience, and (3) general versus specific descriptions. Three of the autistic children and two of the typically developing children could not recall a time they felt lonely. These responses were counted as missing data and were excluded from the analyses.

Chi-square statistics did not yield significant differences on any of the three dimensions. In terms of locus of control, 37% of the autistic children attributed internal variables to their experience of loneliness as compared to 53% of typical children. The majority of children included an audience (73.7% of autistic children and 88.2% of typical children), and 58% of the autistic children and 70.6% of the typical children gave specific examples of a time they felt lonely.

Finally, scores on the Loneliness Rating Scale were compared. Autistic children reported greater feelings of loneliness ($M = 43, SD = 14.21$) than did typical children ($M = 27, SD = 6.42$), $F(1, 39) = 19.4, p < .001$.

Friendship

An ANOVA on children's definition of friendship total scores yielded a significant effect of group, $F(1, 39) = 15.25, p < .001$. Compared to the typical children, autistic children obtained lower mean scores for their definitions of friendship. Overall 47% of the typical children, compared to 9.5% of the autistic children, gave a complete definition for friendship (including all three dimensions of friendship— affective, intimacy, and companionship), $\chi^2(3, n = 41) = 11.62, p < .01$.

In further examining children's definitions, Chi-square statistics were computed on the percentage of children in each group who provided definitions including only one dimension. On the affective dimension, 41% of the autistic children included the affective dimension whereas 73.7% of the typical children, $\chi^2(1, n = 41) = 4.44, p < .05$, did so. Fifty-nine percent of the autistic children described a friend as a com-

panion in their definitions compared to 89.5% of typical children, $\chi^2(1, n = 41) = 4.79, p < .05$. Finally, 40.9% of the autistic children included intimacy in their definitions as compared to 68.4% of the typical children. Group differences on intimacy approached significance, $\chi^2(1, n = 41) = 3.10, p < .07$.

All 22 autistic children could identify one best friend prior to their performance on the Quality of Friendship Scale. Their scores on this questionnaire were compared to typical children's scores using a MANOVA with group as the independent variable and each of the subscales (companionship, security, closeness, help, and conflict) as dependent variables. The significant MANOVA, F (Wilks's criterion) (5, 35) = 3.56, $p < .01$, was followed up with individual ANOVAs. Results indicated that autistic children obtained lower scores on the subscales of companionship, security, and help (see Table 2).

Mothers' Reports of Friends for the Children with Autism

A comparison of mother and child reports of number of best friends yielded a significant difference, paired t test, $t(21) = 2.11, p < .05$. Mothers reports of their children's number of friends ($M = 2.3$) were greater than their children's reports ($M = 1.6$).

Some general themes were evident in mothers' comments about their children's friendship, particularly comments concerning the frequency and content of play. First, mothers frequently described desired relationships rather than actual relationships, e.g., "He says that Joe is his best friend, but Joe ignores him most of the time." Second, mothers described their children's friendships as centered around games (in most cases videogames) with little interaction involved. One mother wrote, for example, "When they play together they choose games with minimal contact between them. They choose to watch videos, play video games or board games very often." Mothers reported that most interactions with friends took place

Table 2 Group Differences on Quality of Friendship for Autistic and Typical Children

Quality of Friendship Scale-Subscales	Autism		Typical		Group Differences	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> (1, 39)	<i>P</i> value
Companionship	3.56	.79	4.01	.38	4.93	.05
Security	3.41	.73	4.17	.54	13.97	.001
Closeness	4.28	.44	4.44	.31	1.76	<i>ns</i>
Help	3.24	.99	4.19	.53	13.73	.001
Conflict	2.20	.79	2.35	.81	.36	<i>ns</i>

Note: MANOVA (Wilks's Criterion) $F(5, 35) = 3.56, p < .01$.

at home or at school, with autistic children rarely initiating play with their neighbors. Finally, the majority of children with autism had at least one special education child as a friend, and in a few cases a friend was a relative.

Within Group Associations

The association between loneliness and friendship was examined in each group. Few associations between loneliness and friendship were found for the autistic children. In the definition of loneliness, the social-cognitive dimension was associated with closeness in the friendship-quality rating scale, and the affective dimension was negatively associated with security. The general/specific dimension in loneliness example was associated with companionship in the definition of friendship.

In contrast, understanding and report of friendships and loneliness were highly related in the typical children. In the typical sample, total loneliness definition scores were associated with total friendship definition scores, and particularly the companionship dimension of the friendship definition. The loneliness definition total score was also associated with security on the friendship/quality rating scale. The social-cognitive dimension of the loneliness definition was associated with companionship on the friendship definition, and with security on the friendship-quality rating scale. Inclusion of an audience in the loneliness

examples was associated with the friendship definition total score and with including affection and intimacy in the definition of friendship. The total loneliness score from the rating scale was negatively associated with closeness in the friendship-quality rating scale (see Table 3).

DISCUSSION

The present study explored loneliness and friendship in high-functioning children with autism. Several questions were addressed. These questions centered on whether children with autism feel loneliness and whether they have friends, as well as on their understanding of both loneliness and friendship. In posing these questions, we also examined how autism might differ from typical development, and how the differences might fit current theoretical debates in the field of autism. Overall, the results of this study have relevance to both clinical and theoretical issues in our understanding of the social-emotional characteristics of children with autism.

The first question related to whether children with autism feel lonely. It was hypothesized that if autistic children feel lonely, then they must have the social desire to be involved in relationships. Likewise, if they desire social relationships, they likely recognize the importance of others in forming a friendship. These hypotheses are based on the understanding that loneliness generally occurs when one recognizes the ab-

Table 3 Correlations between Loneliness and Friendship Measures by Group

	Autism							Typical						
	Loneliness Rating Total	Loneliness Definition			Loneliness Experience			Loneliness Rating Total	Loneliness Definition			Loneliness Experience		
		1	2	3	1	2	3		1	2	3	1	2	3
Friendship Rating scale														
Companionship	-.21	.03	.20	.15	.05	-.28	-.19	-.42	.26	.00	.20	-.28	.16	.42
Security	-.32	-.42*	.16	-.25	.05	-.33	-.27	-.30	.43	.53*	.54**	-.33	.26	-.30
Closeness	-.18	-.13	.44*	.16	.39	-.30	.07	-.62**	.32	-.12	.20	-.16	.25	.09
Help	-.12	-.21	.12	-.10	-.10	.11	-.12	-.23	.17	.08	.17	-.33	.32	-.16
Conflict	.38	-.15	-.06	-.16	-.38	-.14	-.04	.26	.04	.03	.04	-.05	.14	-.22
Friendship Definition														
Affection	.03	-.37	.06	-.26	.01	.26	-.35	-.16	-.08	-.14	-.12	-.24	.66**	.25
Intimacy	.10	-.17	.33	.05	-.07	.08	-.05	-.30	.36	.35	.42	-.09	.56**	-.13
Companionship	-.13	.17	.21	.26	.13	.04	.45*	-.38	.57	.68***	.72***	.26	-.09	.38
Total	.01	-.25	.41	.04	.05	.28	.03	-.44	.42	.42	.50*	-.20	.75***	.20

Note: Loneliness definition: 1 = affective, 2 = social-cognitive, 3 = total score (affective and social-cognitive); Loneliness Experience: 1 = locus of control, 2 = audience, 3 = general/specific.
 * $p < .05$; ** $p < .01$; *** $p < .001$.

sence of a close and intimate relationship or feels the lack of an accessible social group (Asher et al., 1990; Margalit, 1994; Weiss, 1973).

Our findings suggest that autistic children do indeed feel lonely. That autistic children report feeling lonely is of particular interest because this finding counters clinical reports suggesting that autistic children have a "basic desire for aloneness" (Kanner, 1943, p. 5). Moreover, the finding also questions the extent to which children with autism lack understanding of others' thoughts, feelings, and desires (Baron-Cohen, 1989). At least for high-functioning children with autism, our findings suggest that autistic children have the social desire for involvement in relationships with others.

That children with autism want to be involved in social relationships is also supported by the finding that all of the autistic children reported having at least one friend. Still, even though children reported having a best friend, this knowledge did not lessen feelings of loneliness. Indeed, loneliness was experienced by autistic children more intensely and more frequently than it was by typical children. Why might this be? There are several possible explanations.

One explanation is that children with autism understand loneliness differently from typical children. Our results suggest that this is in fact the case. In examining children's definitions of loneliness, two forms of loneliness were noted: emotional loneliness, where the child identifies feelings of sadness, depression, and emptiness; and social-cognitive loneliness, where the child identifies the inaccessibility of a social group, exclusion by others, or being alone. Whereas typical children define and understand loneliness as being alone (with no one to play with) *and* feelings of sadness, the majority of autistic children define loneliness only on the dimension of being alone. They tend not to attribute an emotional feeling (e.g., sadness) to their loneliness. Inclusion of only the social-cognitive aspect suggests that autistic children's interpretation of loneliness is acquired through self-evaluation or social comparison of their experience with that of others or with their own past social experiences. Self-evaluation or social comparison does not involve a reflection of feelings such as sadness, fear, emptiness, or depression. It may be that children with autism have difficulties relating "feelings" to their "knowledge" of loneliness (Hobson, 1993; Kanner, 1943).

Another explanation for why having friends does not lessen feelings of loneliness in autism concerns how the children themselves perceive the meaning of a friend. Typical children generally define a friend in terms of companionship, affection, and intimacy (Buhrmester, 1990; Gottman & Parker, 1986; Howes, 1996;

Parker & Gottman, 1989; Sullivan, 1953; Weiss, 1974). In contrast, autistic children include these dimensions less often. Thus, autistic children may not perceive the role of a friend in the same way as do typical children.

Some support for this notion is found in the fact that autistic children's ratings of the quality of their relationship with their best friend were lower than those of typical children. Specifically, autistic children rated their friend as lower in quality in terms of companionship, security/trust, and helpfulness. Autistic children may be lonely, then, because their friendships are of poor quality, thus not providing them with the security and companionship necessary to lessen feelings of loneliness.

One finding, however, reduces the strength of this argument. In this study, we found that autistic children were similar to typical children on ratings of closeness. High levels of closeness should help to offset feelings of loneliness because closeness includes items reflecting a sense of affection or "specialness" that the child experiences with a friend. However, closeness may have been rated high because autistic children were reporting a desirable rather than an actual situation. On the other hand, it may be that loneliness and friendship constructs are not linked in the same way for autistic children as they are for typical children.

Indeed, our findings indicate that understanding and reports of loneliness and friendship were closely associated in typical children, but not in children with autism. The associations found in typical children link loneliness and friendship in such a way that the two constructs, while different, are still very closely related. Closeness in typical friendships reduces loneliness. The perception of a friend as a companion is related with less loneliness. The understanding of loneliness is linked to the understanding of friendship, and the audience has an important role in both loneliness and friendship. Typical children understand, then, that when one comprehends what a friend is, one also understands what it means when there is no friend around. Children with autism demonstrated understandings of friendship, but these understandings were not utilized to reduce feelings of loneliness. Children with autism may lack the "affective glue" to connect these two closely related concepts.

An important issue addressed in this study was the extent to which findings on children's understandings of loneliness and friendship might contribute to our broader understanding of the psychological mechanisms underlying autistic children's social-emotional deficits. The affective and cognitive theoretical views offer different explanations for the core deficits in children with autism. The cognitive theory empha-

sizes difficulties in inferring others' states of mind (Baron-Cohen, 1988, 1989, 1991, 1993; Baron-Cohen, Leslie, & Frith, 1985; Perner, Frith, Leslie, & Leekam, 1989; Yirmiya, Solomonica-Levi, Shulman, & Pilowsky, 1996) and difficulties in reasoning about hypothetical situations (Frith, 1989; Harris, 1993; Hughes, Russel, & Robbin, 1994). The finding that high-functioning children with autism report high degrees of loneliness make this interpretation of the core deficit less likely. In order to feel lonely, the child needs to be able to make the reflection of himself through the eyes of another person, either by feeling rejected (social-cognitive loneliness) or by feeling the lack of another person to fulfill his emotional needs (emotional loneliness). Thus the experience of loneliness is based on the child's understanding of the self as a distinct entity, and on inferring other states of mind about the self. All in all, the fact that children with autism felt lonely casts doubt on the cognitive explanation of the core deficit.

The affective view of autism predicts difficulties in the ability to be emotionally attached to a friend (Hobson, 1989, 1993; Kanner, 1943). Following this view, children with autism would be less likely than typically developing children to include the emotional dimension of loneliness. Indeed, our findings support this view. Children with autism in the current study were more likely to understand loneliness in a cognitive sense (the social-cognitive loneliness); thus, their loneliness could have been acquired through cognitive processes and observations of other children's behavior and not necessarily through emotional experience. Other findings of the current study support the affective view as well: fewer associations between friendship and loneliness compared to typically developing children, the inability to utilize closeness to reduce loneliness, and the low frequency of appearance of the more affective dimensions in the definition of a friend (affection and intimacy). These findings support the view that children with autism lack understanding of the emotional aspects of both loneliness and friendship. It may be, as Hobson (1993) suggested, that to "know" about a friend is to experience "reciprocal relations based on feelings." Such "knowledge," then, might be deficient in high-functioning children with autism.

An important contribution of this study is the documentation that high-functioning children with autism perceive themselves as having friends. Some limitations should be noted, however. One is that findings are based mainly on self-reports and interviews with children. Obtaining information directly from participants provides important information, but this process can also make it difficult to clearly distinguish

between a desirable report of the participant and an actual one (Capps, Sigman, & Yirmiya, 1995). In addition, reciprocal nominations of friendship were not included in the present study, thus making it difficult to determine if children with autism have mutual friendships or only unilateral friendships (in which no reciprocity is needed; Guralnick & Groom, 1988). Similarly, the difference between the child and mother reports for the number of friends may be due to mothers overestimating the number of friends their children have or to the children themselves not recognizing some of their acquaintances as friends. Observations of friend dyads were not included in the present study because at the onset it was unclear if children with autism had friends at all.

It also is important to note that our findings can be extended only to high-functioning children with autism who represent 25–30% of the autistic population. Because the majority of children with autism are also mentally retarded, studies of high-functioning children, although relatively rare, yield important information about the nature of autism that is distinct from (perhaps unconfounded by) mental retardation. Moreover, this subgroup of children has more often been neglected in treatment considerations (Hurley-Geffner, 1996; Rutter, 1996) yet may benefit from specific interventions. Given our focus on high-functioning children with autism, the implications of this study for children who also are mentally retarded should be considered in future studies.

In summary, this study contributes both to our understanding of the social-emotional deficits in autism and to the theoretical views of autism. The finding that autistic children report greater loneliness and less satisfaction with their friendships is cause for concern. Autistic children may benefit from specific treatment programs aimed at teaching social knowledge and understanding rather than on efforts aimed at motivating social involvement (Hurley-Geffner, 1996). Additionally, future studies and interventions should examine the important role that parents and teachers might play in facilitating friendship formation and in supporting ongoing relationships in autistic children.

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ADDRESSES AND AFFILIATIONS

Corresponding author: Nirit Bauminger, School of Education, Bar-Ilan University, Ramat-Gan, 52900, Israel; e-mail: bauminn@mail.biu.ac.il. Connie Kasari is at the University of California, Los Angeles.

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