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The Link Between Perceptions of Self and of Social Relationships in High-Functioning Children With Autism

Nirit Bauminger,[1,3] Cory Shulman,[2] and Galit Agam[1]

This study examined the perception of friendship in high-functioning children with autism (8–17 years old) and the link between perceptions of self and of social relationships in these children. Sixteen typically developing children were matched to sixteen high-functioning children with autism, on chronological age, IQ, gender, and mother's education. Study measures included a friendship picture recognition task and three self-report questionnaires: qualities of friendship, loneliness, and self-perception profile. Main results indicated that even if children with autism more frequently related to the intersubjective qualities of friendship such as affective sharing or intimacy, they perceived their friendship to be as close as did typically developing children. Also, for the group with autism, friendship correlated positively with cognitive competencies and general self-worth and negatively with loneliness. In addition, children with autism perceived their social and athletic competencies as lower compared with typically developing children. Implications of the associations between self-perceptions and perceptions of friendship are discussed.

KEY WORDS: high-functioning children with autism; friendship; self perception; loneliness.

INTRODUCTION

The development of the self and the development of social relationships intertwine in children's socioemotional development. Through the eyes of their friends, children obtain insights about themselves, and, in turn, deeper

[1]School of Education, Bar-Ilan University, Ramat-Gan, Israel.
[2]School of Social Work, Hebrew University of Jerusalem, Jerusalem, Israel.
[3]To whom correspondence should be addressed at School of Education, Bar-Ilan University, 52900 Ramat-Gan, Israel; e-mail: bauminn@mail.biu.ac.il.

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insight into oneself leads to a higher capability for intimacy with a close friend. In children with autism, both the development of the self, mainly the "interpersonal self" (e.g., the perception of the self as a social entity and as an object of others' concern and evaluation, Neisser, 1988) on the one hand, and the development of social relationships such as friendship on the other hand, are considered major areas of difficulty. Thus, the present study will focus on obtaining more comprehensive understanding about the link between these two concepts. We will begin by discussing the development of friendship and self-concept in typically developing children, and will continue with the description of these two issues in children with autism.

Friendship in Typically Developing Children

Although researchers continue to debate the definition of friendship across the lifespan, overall, they tend to agree that friendship serves the functions of affection, intimacy–trust, and companionship. Affection refers to the basic function of a friend as someone with whom one holds a close affective tie (Howes, 1996). According to Hobson (1993, p. 5), "Without emotional experience of appropriate kinds of interpersonal relations, one can not fathom what a 'friend' is." The intimacy function—where a friend is someone with whom to share one's inner world (e.g., desires, fears, emotions, intentions, pleasures)—coincides with Hobson's "intersubjective sharing with others" as the basic criterion for understanding friendship (Buhrmester, 1990; Sullivan, 1953). The companionship function—where a friend is someone with whom to play or perform different activities—consists of a less affective-based dimension (Howes, 1996).

The question remains as to whether all of these functions of friendship apply to all ages. Researchers who investigated older children's friendships (i.e., preadolescents and adolescents) tended to question the ability of young children to experience intimacy with a best friend. According to these researchers, the functions and the forms of friendship change over development, from focusing on playmate activities and gaining pleasure from games in early childhood—through group acceptance among elementary school children—to more intimate relationships in adolescence (Buhrmester, 1990; Parker and Gottman, 1989). This approach, rooted in the interpersonal theory of Sullivan (1953), speculated that "true friendship" (e.g., affectionate and intimate) does not develop until preadolescence (9–10 years of age), due to younger children's limited ability to relate intimately to their peers.

Parker and Gottman (1989) provided some support for this approach by describing a developmental model of friendship from early childhood to adolescence on the basis of observation of children's conversations. According to

their model, in early childhood (3–7 years old), friendship's main function consists of providing a context to maximize the level of coordinated play, from parallel play up to the highest level of play (fantasy play). This context enables children's attainment of the highest possible level of excitement and stimulation from their play. During these early childhood years, friendship teaches children to regulate and display their emotions to others; however, their understanding of emotions remains very concrete and undifferentiated. In middle childhood (8–12 years old), when anxiety about peer relations develops, friendships serve children's needs for knowledge of behavioral norms, mainly through gossip. Friendship at this stage also fosters skills for self-presentation and impression management, especially with respect to emotional display (e.g., learning to be "cool" by rejecting emotionality in favor of rationality, to avoid embarrassment). Middle childhood friendships are predominantly same sex and with larger groups than in early childhood. In adolescence (13–18), according to this model, the most important socioemotional task comprises the need to rebuild the "territories of the self," that is, to obtain answers to self-identity issues such as who I am and what kind of a person I am. Adolescent friendships serve functions of self-exploration and the experience of intimacy, chiefly through self-disclosure (Buhrmester, 1990; Parker and Gottman, 1989). Because of their cognitive advancement to the level of formal operational thought, and their greater emotional maturation (e.g., conceptualization of emotions), adolescents can perform direct self-disclosure by discussing their relationships abstractly as well as sharing their emotions. Through these discussions with their friends, they obtain higher insights into their self-concept and self-identity.

Overall, this model demonstrates how the functions of friendship may change with age in correspondence with developmental growth in other domains, such as the level of cognitive abstractive thinking or the understanding of more complex emotions. In general, friendship shifts from more external-behavioristic functions such as shared activities and games, to more internal psychological functions such as intimacy. Also, according to Parker and Gottman (1989), self-concept relates closely and is even constructed via the perception of social relationships, primarily during the preadolescent and adolescent years. Children learn display rules and to build the territories of the self through their relationships with friends. The perception of the self (their self-concept) relates to the perception of others (Frith and Happe, 1999; Mayes and Cohen, 1992).

Self-Concept in Typically Developing Children

The first stage in the development of self-concept comprises the child's recognition of the self as a unique entity that is distinct from the environment

and that involves a self–others distinction. Next, during the preschool period, emphasis moves from self-recognition to self-esteem and self-concept (Evans, 1998). Self-esteem involves evaluations about our own competencies and worth, and self-concept refers to our beliefs about the self (Harter, 1983). Preschoolers tend to report ideal perceptions of the self rather than actual competencies, and they differentiate less between the various domains of self-evaluation; for example, a child who excels at sports may overgeneralize this ability to other areas such as drawing or academic capabilities. They also evidence more concrete perceptions of the self, on the basis of specific behaviors or physical characteristics. Moreover, unlike older children, preschoolers tend to exclude peer social information in their self-concept formation (Evans, 1998). By the age of approximately 8 years, children are thought to have the cognitive capacities to report their actual, differentiated competencies (e.g., good at sports, weak at art) and to form a self-concept on the basis of social comparison processes (Evans, 1998; Harter, 1982, 1983, 1990). The major goal of adolescence consists of integrating the differentiated aspects of the self into a coherent personality (Erikson, 1968). Also, adolescents' self-concept is more vulnerable because of their ability to acknowledge the gap between the real and the ideal self, which, if high, may lead to depressive affect (Evans, 1998). Furthermore, despite the increased capability for an abstract view of the self, adolescents' physical appearance was found to predict global self-worth during adolescence, due to the multiple physiological changes and escalating desire to be attractive for the opposite sex (Evans *et al.*, 1995).

Self-Concept and the Perception of Friendship in Children With Autism

Albeit its significance to the understanding of autism, perceptions of the self and of social relationships in children with autism have triggered much theoretical speculation but very little empirical study. Hobson (1993) conjectured that children with autism are unable to grasp the meaning of friendship due to their limited intersubjective sharing capabilities. He purported that these children lack the ability to experience emotionally based social relationships such as friendship, and thus they fail to understand the more affective interpersonal meaning of a friend. To the best of our knowledge, only one study has directly examined the understanding of friendship among a group of high-functioning children with autism (Bauminger and Kasari, 2000). In that study, high-functioning preadolescents' and adolescents' perceptions of a friend and of the qualities of their friendship with a best friend were compared to those of typically developing age mates. When asked to describe what a friend is, children's definitions

were scored according to three criteria: companionship ("a friend is someone you can play with"), intimacy ("a friend is someone you can share secrets with"), and affective closeness ("a friend is someone who cares about you"). Results indicated that children with autism were less likely than their age mates to include the affective (41% vs. 73.7%, respectively) and the companionship (59% vs. 89.5%) dimensions in their definition of a friend, whereas differences regarding intimacy (40.9% vs. 68.4%) only reached significance. Overall, 47% of the children with typical development provided definitions including all three dimensions, versus only 9.5% among the autism sample. In terms of the qualities of their friendship, children with autism perceived their friendships as lower on the dimensions of companionship, security–intimacy, and help, but not on closeness or conflict, when compared with the friendship qualities of typically developing children.

Thus, Hobson's hypothesis (Hobson, 1993), regarding the difficulties of children with autism to reflect on the more affective dimension of friendship, obtained only partial support. On the one hand, high-functioning children with autism exhibited difficulties in incorporating the affective dimension into the definition of a friend; on the other hand, they rated their closeness to a best friend as highly as did typically developing children. In the Bauminger and Kasari (2000) study, we suggested two explanations for these high rates of affective closeness in children with autism. First, these reports may have represented a desired rather than actual closeness in their friendship. This explanation was supported by the finding that these children with autism also reported greater loneliness compared with typical controls, meaning that the high closeness with a friend reported by them was not related with less feelings of loneliness, as it was for the typically developing children. A second explanation proposed that due to the difficulty among children with autism in establishing friendship with peers, they cherish the ones they have already achieved—thus reporting high closeness in friendship. Consequently, questions remain regarding the perceptions of closeness and intimacy in the friendships of children with autism.

Different researchers (e.g., Hobson, 1993; Roger and Pennington, 1991) have claimed that, among individuals with autism, primary limitations in interpersonal relatedness constitute a source of deficiency in the development of psychological concepts and of self-understanding. Introspection about the self among children with autism has been systematically investigated in two studies (Capps *et al.*, 1995; Lee and Hobson, 1998). In the Capps *et al.* study, able children with autism reported about their own competence in four areas: cognitive, social, athletic, and general self-worth. They evidenced lower self-perception than their typical age mates on all dimensions except for

cognitive competence. Children with autism who rated themselves lower on the self-perception questionnaire exhibited a higher IQ, were better able to report about their own and others' emotional experiences, and displayed more socially adaptive behavior. It should be noted that this study included neither a self-perception of appearance (considered important for adolescents' self-worth) nor a self-perception of behaviors and peculiarities (which may constrain the ability for adequate social interaction among children with autism). Thus, these two domains in the self-perception of children with autism deserve further examination.

A second study by Lee and Hobson (1998) investigated the self-understanding of able individuals with autism. Examining whether children's talk about their world would include psychological (description of emotions) as well as social attributes, these authors speculated a specific problem in the development of the interpersonal self. Results indeed supported this speculation: None of the children with autism made a social self-statement that referred to friends or to being a member of a social group. However, children with autism did not generate fewer psychological statements in describing themselves, even if they presented more restricted knowledge of emotions. Aside from these differences, children with autism seemed to resemble their typical peers in thinking about their physical attributes, activities, and preferences. On the basis of these findings, the authors suggested that their sample was characterized by absence or restriction of specific rather than global aspects of self-awareness. In particular, children with autism were less likely to view themselves in the context of their relationships and interactions with other people. Considering these two studies together, uncertainty persists as to this population's ability to understand, on the one hand, the interpersonal dimensions within the perception of social relationships such as friendship (closeness and intimacy) and, on the other hand, how these interpersonal dimensions are linked to their self-perceptions. The present study aimed to narrow the gap in the literature by further exploring the associations between perceptions of self and of social relationships (friendships) in high-functioning children with autism.

More specifically, this study examined: (1) group differences (autism vs. typical) in the perception of friendship, especially interpersonal dimensions (e.g., intimacy, closeness); (2) group differences in the perception of the lack of social relationships, as reflected in children's evaluation of their loneliness; (3) group differences in perceptions of the self regarding scholastic, social, and athletic competencies, self-appearance, behavioral conduct, and general self-worth; (4) associations between the perceptions of self, social relationships (friendship), and the lack of social relationships (loneliness) in each group; and (5) correlations between perceptions of the self,

and the perception of friendship and loneliness with chronological age and with IQ.

METHOD

Participants

Participants included 32 preadolescents and adolescents: 16 (1 girl) high-functioning individuals with autism between the ages of 8;3 (8 years; 3 months) and 17;2, and a matched group of 16 (1 girl) typically developing individuals between the ages of 8;8 and 16;3 ($M = 11.16$, $SD = 2.91$; $M = 11.41$, $SD = 2.68$, respectively). Mean full-scale IQ scores, as measured on the WISC-R (Wechsler, 1974), were $M = 92.63$ ($SD = 13.90$) for the children with autism and $M = 97.94$ ($SD = 7.22$) for the typically developing group.

The children with autism were recruited through the Special Education Department in the Israeli Ministry of Education. Prior to participation in the study, all of the children with autism were diagnosed by a licensed psychologist unassociated with the current study. All 16 children met criteria for children with autism disorder recommended by the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth edition—revised (*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; Lord *et al.*, 1994) was administered to the parents of the children by the first and second authors of this paper to verify diagnosis and to provide additional information about the children's developmental histories. The ADI-R focuses on meeting criteria for autism in three main areas: reciprocal social interaction; communication and language; and repetitive, restrictive, and stereotyped behaviors. The child also needs to show evidence of developmental delay or deviance prior to the age of 36 months. All 16 children met criteria for autism on all four ADI-R domains.

Typical children were recruited from local public schools. As shown in Table I, the group of typically developing children was matched to the children with autism on chronological age, verbal, performance, full-scale IQ scores, gender, and maternal education. Student's t tests revealed no differences between groups any demographic variables.

Table I. Sample Characteristics

	Autism ($n = 16$)	Typical ($n = 16$)	Significance
Chronological age (in years/months)			
Mean (Standard deviation)	11.16 (2.91)	11.41 (2.68)	*ns*
Range	8.25–17.16	8.66–16.25	
Full-scale IQ			
Mean (Standard deviation)	92.63 (13.90)	97.94 (7.22)	*ns*
Range	77–117	83–111	
Verbal IQ			
Mean (Standard deviation)	91.25 (14.91)	95.06 (5.56)	*ns*
Range	76–128	87–104	
Performance IQ			
Mean (Standard deviation)	95.88 (14.68)	101.69 (11.32)	*ns*
Range	77–131	82–122	
Male/female ratio	15/1	15/1	*ns*
Mother's education (*M*/*SD*)	6.60 (1.35)	5.73 (1.33)	*ns*

Note. IQ scores are based on the WISC-R. Mother's education was calculated on a 1 to 8 scale (1 = *less than seventh 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*).

Assessment Measures

Children's Perception of Social Relationships

Two different measures were used to evaluate children's perception of friendship. The first measure comprised a projective test with mostly open-ended prompts to evaluate the child's general perception of friendship, without specifically referring to the child's concrete, personal social relationships with peers. This measure assessed if the child recognized this phenomenon and what features the child attributed to two children in a potential friendship. The second measure elicited self-reported closed answers focusing on children's evaluation of the qualities of friendship with their own best friend. This measure related to a specific actual relationship, rather than to a more abstract understanding of friendship. Implementation of these two different measures provided information on the differences between a more global perception of a friend, and the perception of the unique experience with a friend.

The Perception of Friendship. The Friendship Picture Recognition Interview was developed for the purpose of this study to assess children's perception of friendship. Participants were shown a color drawing depicting an intimate scene between two friends. The two children were sitting in a close proximity, looking and smiling at each other. The picture underwent pilot analysis prior to the beginning of the study, and all 15 typically developing preadolescent and adolescent pilot participants (unrelated to the present sample) could easily identify that the two children in the picture were close friends.

After viewing the picture, children in this study were asked the following three to four questions: (1) Can you give a title to the picture? (2) Can you tell a short story about the picture? (3) Are the children in the picture friends? and (4) (only if the answer to question 3 was yes:) How do we know?

The first question requesting a title aimed to assess children's ability to recognize friendship in the picture. A score of 1 was given to a title suggesting the recognition of friendship or peer relations in the picture, and a score of 0 was given to answers that did not include recognition of friendship in the picture.

The second question, requesting a short story, aimed to indirectly stimulate the children to elicit contents related to friendship, and to provide them with another opportunity to attribute friendship characteristics to the picture even if they did not name it as such. In line with Furman and Bierman (1983), children's stories were analyzed according to the child's description of the quality of the relationships and interactions between the children in the picture. Two categories were coded: low- and high-quality of interaction. Low-quality interactions reflected concrete and basic interactions between the two children in the picture, focusing on children's actions or describing children's proximity, but lacking the attribution of friendship characteristics such as affective engagement or intimacy. Examples of low-quality responses included: "The kids are thinking what do to" or "They are sitting and talking" (from the autism group); or "Two children are talking" (from the typical group). High-level quality reflected interactions based on interpersonal functions of friendship such as closeness, intimacy, support, reciprocity, familiarity, and togetherness (Furman and Bierman, 1983). Examples of high-quality responses included (from the typical group): "Eran and Yossi are very good friends [closeness], Eran tells Yossi secrets [intimacy], and then he asks Yossi to tell him secrets [reciprocity]" or "One day two children set up a camp together in the rocks under the cliff, and the kids called themselves a team [togetherness] so they will never feel lonely [closeness]." Two raters who were blind to the children's group membership independently coded a randomly selected 50% of children's responses across participants, and reached interrater agreement of 95% for the quality of interaction. A score of 1 was given to descriptions of low-quality interactions, and a score of 2 was given to descriptions of high-quality interactions.

The third question aimed to assess whether children would be able to recognize friendship in the picture after being provided with a direct verbal clue identifying the children as such. A score of 1 was given to "yes" and 0 to "no." Children who replied positively to the direct question ("Are the children in the picture friends?") were asked to justify their answer ("How do we know?"). This fourth question aimed to examine children's understanding of the social markers of friendship. Content analysis of children's answers is described below in the Results section.

The Perception of Friendship Qualities. The self-reported Friendship Qualities Scale (Bukowski *et al.*, 1994) was utilized to assess children's perception of the qualities of their friendship with a best friend. At first, the child was asked verbally to nominate his or her best friend. The child was then instructed to answer the 23-item questionnaire in reference to his or her relationship with that best friend, along a 5-point scale from 1 (*not true at all*) to 5 (*very true*). The 23 items constituted 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 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 included four items in each category; security, closeness, and help dimensions included five items in each category. Scores were calculated using the mean score in each category. Using Cronbach's alpha, the internal validity of each subscale was: Companionship, $\alpha = .70$; Conflict, $\alpha = .75$; Help, $\alpha = .93$; Security, $\alpha = .81$; and Closeness, $\alpha = .72$.

Children's Perception of Lack of Social Relationships

The Experience of Loneliness. The Loneliness Rating Scale (Asher *et al.*, 1984) was employed to assess children's feelings of loneliness. This standardized self-report questionnaire contained 24 items rated on a 5-point scale from *not true at all* (1) *to always true* (5). Sixteen items focused 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 left alone at school"). Eight filler items covered hobbies, interests, and school subject preferences. The child obtained a total loneliness score on the basis of the 16 items. Higher scores indicated a greater sense of loneliness.

Considerable evidence has suggested that the loneliness self-report is psychometrically sound with different ages of typical children (Asher and Wheeler, 1985; Cassidy and Asher, 1992; Renshaw and Brown, 1993). This scale demonstrated internal consistency ($\alpha = .90$) and stability across a 12-month time frame (Asher and Wheeler, 1985; Cassidy and Asher, 1992). Also, this instrument was successfully implemented with a sample of high-functioning preadolescents and adolescents with autism (Bauminger and Kasari, 2000).

Children's Perception of the Self

Self-Perception. The Self-Perception Profile for Children (Harter, 1985) comprised a 36-item self-report to assess children's perceptions of themselves

across six domains. These domains comprised: scholastic competence (does well at schoolwork); social acceptance (has a lot of friends); athletic competence (does well at different sports); physical appearance (likes one's body); behavioral conduct (usually does the right thing); and general self-worth (is happy with oneself). The child was presented with a question such as, "Some kids find it hard to make friends, but for other kids it's pretty easy." The child was asked to indicate which of the two types of child he or she most resembled, and then to decide whether the description was "sort of true" or "really true." Each item was scored from perceived *low competence* (1) *to perceived high competence* (4). Scores for each 6-item subscale were summed and then averaged. Using Cronbach's alpha, the internal validity of the different subscales ranged between .60 and .76.

RESULTS

The Perception of Friendship—Picture Recognition

The first set of analyses focused on the child's perception of friendship along four main dimensions corresponding with the four questions: (a) recognition of friendship in the picture without direct verbal stimuli; (b) description of the pictured children's quality of interaction; (c) recognition of friendship in the picture with direct verbal stimuli; and (d) justification of friendship via identification of social markers.

In response to the request for a title without direct verbal stimuli, 50% of the group of high-functioning children with autism could name the picture as friendship ($n = 8$), versus 81.3% ($n = 13$) of the children with typical development; yet differences between the groups only reached significance, $\chi^2(1, 32) = 3.46$, $p = .06$. The titles provided by the children in both samples are presented in the Appendix. Group differences did not reach significance; however, qualitative differences as to the nature of children's responses emerged. Out of the participants who recognized the pictured children as friends, only one child with autism could relate to a more intersubjective sharing and closeness function of the friendship (soul mates), whereas many of the typical children did so (e.g., best friends, secret friends; brotherhood). Thus, typical children provided more affective-interpersonally oriented titles to the picture.

Interestingly, the cognitive profile (verbal IQ or full IQ) of the children with autism varied between the 50% who recognized friendship in the picture and the 50% who did not (Pearson correlation with IQ was *ns* in both subgroups). The child who titled the picture as soul mates evidenced one of the highest cognitive profiles in the autism sample (verbal IQ = 102 and full IQ = 103); however, three of the children with autism who did not name the

picture as friendship also revealed verbal and full IQ scores above 100 (101, 120, 128, and 117, 116, 114, respectively).

In response to the request for a short story, 62% ($n = 10$) of the children with autism provided descriptions coded as a low-interaction quality, versus only 12.5% ($n = 2$) in the children with typical development, $\chi^2(1, 32) = 8.53$, $p < .01$, $\Phi = .51$. These significant group differences found for the description of the pictured children's relationship and interaction quality corresponded with the direction of the qualitative group differences noted for the nature of participants' titles to the picture.

In response to the direct verbal prompt as to whether the two children were friends, 93.8% ($n = 15$) of the children with autism answered affirmatively, in contrast to only 50% of this group who could name the picture as friendship before they were provided with direct stimuli. In the typical group, all 16 children responded affirmatively, in contrast to 81.3% prior to the direct question.

Content analysis of children's justifications in response to the fourth question revealed the following. Among the 15 children with autism who answered affirmatively, 26.6% ($n = 4$) could not justify their answer; 20% ($n = 3$) said that the pictured children were sitting in close proximity ("They are sitting friend next to friend," "They are next to each other"); 13.3% ($n = 2$) said the children were looking at each other; 13% ($n = 2$) said the children were talking with one another; 20% ($n = 3$) combined close proximity with talk ($n = 2$) or with a look ($n = 1$); and 6.6% ($n = 1$) referred to the children's facial expression: "By the smile on their faces, it looks like they really like each other." Children with typical development justified their ascription of friendship as follows: close proximity (18.75%: $n = 3$); talking (31.25%: $n = 5$); intimate talk such as telling secrets (18.75%: $n = 3$); affection such as smile (18.75%: $n = 3$); cohesion ("The children have the same style of dress so they have the same mindset, 6.25%: $n = 1$); and mutual gaze and listening ("The children are looking at each other and listening very carefully to one another, 6.25%: $n = 1$). In sum, children with autism attended mainly to the pictured children's close proximity and/or to their activities (talking), whereas typically developing children's justifications varied across different domains and included activities, affective sharing, and cohesion.

The Perception of Friendship—Friendship Qualities

In the autism group, 2 of the 16 children could not identify a best friend when asked and thus did not complete the Friendship Qualities Scale. Scores for the 14 children with autism were compared to those of the 16 children with typical development using a multivariate analysis of variance (MANOVA),

Table II. Means, Standard Deviations, and *F* Values for the Differences Between Children With Autism and Children With Typical Development Regarding Friendship Qualities With a Best Friend

	Autism		Typical		Group differences	
Subscale	*M*	*SD*	*M*	*SD*	$F(1, 28)$	η^2
Companionship	3.05	0.87	4.00	0.44	14.38***	0.34
Security	3.15	1.03	4.26	0.61	12.98***	0.32
Closeness	3.57	0.94	4.10	0.58	3.51	—
Help	2.95	1.45	4.47	0.44	15.88***	0.36
Conflict	2.03	0.69	2.48	1.02	1.90	—

Note. MANOVA: Wilks's criterion $F(5, 24) = 4.50$, $p < .01$.
*** $p < .001$.

with group as the independent variable and each of the subscales (companionship, conflict, help, security, and closeness) as dependent variables. The significant MANOVA, Wilks's criterion $F(5, 24) = 4.50$, $p < .01$, was followed up with individual ANOVAs. Results indicated that children with autism obtained lower scores on the subscales of companionship, security, and help (see Table II).

The Perception of Lack of Social Relationships—The Experience of Loneliness

To examine group differences (autism vs. typical) on the Loneliness Rating Scale, univariate ANOVAs were conducted with group as the independent variable and the loneliness score as the dependent variable. Results indicated that, in comparison to typically developing children, children with autism reported higher feelings of loneliness ($M = 26.12$, $SD = 7.1$; $M = 42.19$, $SD = 14.88$, respectively; $F(1, 31) = 15.16$, $p < .001$, $\eta^2 = .34$).

Children's Perception of the Self

Self-perception scores of the children with autism were compared to those of the typically developing children using a MANOVA with group as the independent variable and each of the subscales (scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, and general self-worth) as dependent variables. The significant MANOVA, Wilks's criterion $F(6, 24) = 5.95$, $p < .001$, was followed up with individual ANOVAs. Results indicated that children with autism obtained lower scores on the social acceptance and athletic competence subscales (see Table III).

Table III. Means, Standard Deviations, and *F* Values for the Differences Between Children With Autism and Children With Typical Development Regarding Perception of the Self

	Autism		Typical		Group differences	
Subscale	*M*	*SD*	*M*	*SD*	$F(1, 28)$	η^2
Scholastic competence	3.15	0.59	3.07	0.60	0.14	—
Social acceptance	2.61	0.71	3.33	0.52	10.35**	0.26
Athletic competence	2.61	0.54	3.21	0.53	10.05**	0.25
Physical appearance	3.15	0.75	3.19	0.41	0.03	—
Behavioral conduct	3.32	0.47	3.00	0.63	2.55	—
General self-worth	3.50	0.52	3.32	0.37	1.18	—

Note. MANOVA: Wilks's criterion $F(6, 24) = 5.95$, $p < .001$.
*** $p < .01$.

Within-Group Associations Between Social Relationships, Loneliness, and Self-Perception

The correlations between friendship qualities with a best friend, loneliness, and self-perception were examined in each group.

Children With Autism

In high-functioning children with autism, friendship was found to correlate significantly with both loneliness and self-perception (see Table IV). More specifically, all but one of the qualities of friendship with a best friend (all but conflict) correlated highly negatively with loneliness. Children who perceived their social relationship with a friend as high in companionship, help, security, and closeness also perceived themselves as less lonely.

In terms of the correlation between the perception of social relationship and self-perception, several significant findings emerged among children with autism (see Table IV). The perception of one's own scholastic competence significantly positively correlated with a friendship characterized by companionship, helping, and closeness. Perception of one's athletic competence correlated positively with a friendship characterized by companionship. The perception on one's own behavioral conduct negatively correlated with conflict in the friendship. The perception of general self-worth significantly correlated with a friendship that provided companionship, security, and closeness. In sum, although different correlations emerged for each subscale of the self-perception questionnaire, it appears that children with autism who exhibited a high self-concept also attributed high friendship qualities to their relationship with a best friend.

Loneliness was found to be negatively associated with the child's self-perceptions in the following areas: scholastic competence ($r = -.65$,

Table IV. Within-Group Correlations Between Friendship, Loneliness, and Self-Perception

	Friendship qualities									
	Autism					Typical				
	1	2	3	4	5	1	2	3	4	5
Loneliness	−.70**	.15	−.78***	−.76***	−.82***	.14	−.03	−.38	−.13	−.09
Self-perception										
Scholastic competence	.66**	.10	.55*	.45	.52*	−.10	.05	.27	.37	−.16
Social acceptance	.33	−.20	.40	.44	.41	−.24	−.04	.55*	.31	.11
Athletic competence	.67**	.13	.26	.27	.34	−.50*	−.14	.02	.22	−.17
Physical appearance	.12	.13	−.25	−.16	−.04	−.30	.35	.09	−.22	.23
Behavioral conduct	.45	−.62*	.23	.41	.16	−.19	−.40	.13	.58**	.16
General self-worth	.53*	−.15	.47	.54*	.61*	−.37	.27	−.04	.02	−.33

Note. Friendship qualities: 1 – companionship; 2 – conflict; 3 – help; 4 – security; 5 – closeness.
* $p < .05$. ** $p < .01$. *** $p < .001$.

$p < .01$); social acceptance ($r = -.51$, $p < .05$); athletic competence ($r = -.59$, $p < .05$); and general self-worth ($r = -.68$, $p < .01$). Children with autism who evidenced a higher perception of themselves scholastically, socially, athletically, and in terms of their general feelings of self-worth, also reported experiencing less loneliness.

Children With Typical Development

Few correlations emerged between friendship, loneliness, and self-perception for the group of typically developing children. All of the correlations between friendship and loneliness for this group were in the negative direction, but none were significant. As per the relationship between friendship qualities and self-perceptions, three significant correlations emerged. The helping quality of friendship correlated positively with self-perceived social acceptance; the security quality of friendship correlated positively with self-perceived behavioral conduct; and the companionship quality of friendship correlated negatively with self-perceived athletic competence. Likewise, although all correlations between loneliness and the self-perception dimensions were negative, only the correlation between loneliness and self-perceived social acceptance was found significant ($r = -.78$, $p < .001$). Typically developing children who perceived themselves as having high-social capabilities also perceived themselves as less lonely.

Correlations With Age and IQ

Social relationships, loneliness, and self-perception were also analyzed for correlations with and full-scale IQ in each group. Only one significant correlation emerged for each group. For the autism sample, the child's chronological age positively correlated with the ability to attribute a friendship-relevant title to the picture without direct stimuli ($r = .70$, $p < .01$). In the typical sample, the child's loneliness score negatively correlated with the full-scale IQ ($r = -.61$, $p < .01$).

DISCUSSION

This study examined the extent to which children with autism perceive friendship as including affective-interpersonal dimensions such as closeness, affective sharing, and intimacy. In addition, we investigated the links between these children's perception of an actual social relationship and their perception of the self across different domains. Interesting results emerged regarding the perception of a friend in these high-functioning children with autism. Overall, children with autism could recognize friendship from a stimulus picture as well as their typically developing peers, but qualitative differences emerged between the groups. Typically developing children attributed more affective-interpersonal experiences to the pictured children (e.g., naming them as best friends or secret friends); included a higher quality of interaction and relationship in their stories about the depicted children; and incorporated affective sharing and intimacy among their social markers of friendship. In contrast, children with autism tended to only name the picture as friendship, without attributing affective characteristics to the scene. They also included fewer attributions of high-interaction quality, such as affective sharing or intimacy, while describing stories about the picture, and their social markers of friendship focused more on children's activities and close proximity. Thus, although analysis did not yield significant differences between the children's groups regarding their ability to name the picture as friendship, qualitative intergroup differences emerged, where children with autism were less likely, overall, to attribute affective-intersubjective dimensions in their perception of a friend.

Interestingly, outcomes of the friendship qualities measure only partially supported this result. Children with autism reported less intimacy and help in their relationship with a best friend, but they also reported less companionship (which is a less affectively based function of friendship). In addition, differences between groups regarding closeness only reached significance. Thus, children with autism perceived their relationships as high in

closeness, similarly to typically developing children's friendships. These results replicate Bauminger and Kasari's study where children reported high closeness in their relationships (Bauminger and Kasari, 2000). Furthermore, in the present study, all of the positive dimensions of friendship (e.g., closeness) were negatively associated with loneliness, indicating that children who perceived their best friendship as high in positive qualities also reported less loneliness.

These findings elicit the question: How can the relationships of children with autism be high in closeness when they find it difficult to relate to the emotional aspects of friendship when perceiving a stimulus picture of friendship? It may be that closeness in these children is generated and perhaps also expressed through different roots (less emotional and more cognitive and/or through sharing activities) compared with typically developing children. The significant associations found between self-perceived scholastic capability and friendship qualities such as companionship, help, and closeness support the link between cognitive capabilities and friendship among children with autism. Differently from typically developing children, children with autism who evaluated themselves as high in scholastic capabilities, also perceived their friendship as high in closeness. This interpretation is consistent with Hermelin and O'Connor's logico-affective hypothesis (Hermelin and O'Connor, 1985), which suggested that children with autism try to compensate for their emotional deficiencies by utilizing their higher cognitive capabilities, and that they learn strategies to recognize and express emotions. It may be that friendship constitutes another area of "study" for these children; thus, those with higher academic capabilities rated their friendship qualities as higher (Kasari *et al.*, 2001). However, only partial support was given in the present study to this notion, due to the fact that IQ was not correlated with any of the friendship dimensions. To further clarify how closeness and intimacy are actually manifested in these children's friendships, future research would do well to expand the current investigation via direct observations of such children's interactions with their best friends.

Another interesting association emerged between the children's perception of social relationships and their perception of self in terms of their general feelings of self-worth. Higher degrees of companionship, intimacy, and closeness with a best friend were linked with a higher sense of general self-worth. This finding supports the hypothesis that friendship relations play an important and significant role for the child with autism (Bauminger and Kasari, 2001). Higher rates of loneliness reported by the children with autism compared to the children with typical development also support this hypothesis. Even if children with autism perceive friendship differently, they consider it to be a valuable type of relationship that can contribute to their general self-worth.

Unlike for typical children, self-perceived athletic capabilities were found to correlate positively with companionship and negatively with loneliness in children with autism. Thus, children with autism who evaluated themselves high on this dimension also evaluated their friendships as high on companionship, and themselves as less lonely. Companionship may indeed incorporate activities of a physical nature that require sports capabilities (e.g., outdoor games). This outcome is worthy of further investigation, in that the facilitation of physical capabilities may comprise a venue to the enhancement of companionship in children with autism.

Overall, except for the social and athletic dimensions, children with autism evaluated their self-concept similarly to typically developing children. Lower rates of social acceptance among children with autism correspond with both Capps et al.'s and Lee and Hobson's studies (Capps *et al.*, 1995; and Lee and Hobson, 1998), thus strengthening the finding that children with autism may have specific problems in their interpersonal self-concept. The low-interpersonal self reported by the aforementioned studies and herein, and the higher degrees of loneliness reported in this study, accentuate that even if these children would like to have friends or to be more socially involved with peers, they do not feel sufficiently able to do so. Children with autism in our study who reported themselves high in the social acceptance dimension on the self-concept scale perceived themselves as less lonely. Thus, enhancement of social competence in high-functioning children with autism seems very important to their general self-worth. Difficulties in social understanding may also be noted from the lower number of children with autism who could recognize the friendship picture as such before given a direct verbal clue, as compared to the vast majority who succeeded after receiving direct verbal stimuli and who could, for the majority, justify their responses. This difficulty in recognizing the two pictured children as friends prior to direct stimulation may indicate problems in social cognition—a difficulty giving the social situation a correct interpretation.

A major shortcoming of this present study should be acknowledged: its small sample size and large age range. High-functioning children with autism comprise a unique subgroup (prevalence of 30%) within the population diagnosed with autism. This subgroup does not reveal mental retardation and thus exhibits "pure" autism traits (Schopler, 1985). In contrast to the majority of children with autism, who are also mentally retarded, high-functioning children have an IQ over 70 and thus function intellectually above the mental deficiency level (Yirmiya and Sigman, 1991). Considering the low incidence of high-functioning children within the autism population and considering the paucity of children within this population who possess stable friendships with peers, a sample of 16 is considered reasonable. However, this sample size may have an effect on study results. For example, the small sample size

limited our ability to examine group differences between middle childhood and adolescence that would shed light on how development affects the perception of friendship and/or self in children with autism. Both theories—on the understanding of friendship and of self—state that children over age 8 have already attained the understanding of both concepts (see, for example, Evan, 1998; Howes, 1996). However, it may be of interest for future research to investigate how development affects the perception of friendship in children with autism, utilizing larger numbers of children in each age group. Small sample size could also have reduced the power of the study results. Indeed, the indication of the power of the significant results found in the current study revealed a reasonable effect size (η^2 of .20 and above and a ϕ of .51); however, a larger sample size could have strengthened the results. It is important to note that although high-functioning children with autism reflect only 30% of the autism population, their empirical significance remains beyond doubt, inasmuch as they enable the investigation of pure autism syndrome without being confounded with mental retardation.

In summary, the current study presented a complex picture regarding the perception of a friend and the link between the perception of self and of social relationships in high-functioning children with autism. On the one hand, these children related less to the intersubjective qualities of friendship (affective sharing, intimacy) and demonstrated more difficulty recognizing friendship from a picture without a direct verbal clue. On the other hand, they perceived their own friendship with a best friend to be as close as the friendship depicted by typically developing children; and those children with autism who reported a high degree of closeness in their friendship also reported less loneliness. Moreover, all but one of the children with autism succeeded in identifying friendship after receiving a direct verbal prompt. It is also important to note that children with autism may need help in developing friendship; they perceived themselves as less socially able compared with typically developing children and friendship was associated with general feelings of self-worth in these children.

Because of the study's small sample size, it may be considered preliminary, suggesting important directions for understanding the perception of friendship and of self in high-functioning children with autism, but necessitating expansion in future studies to include a larger sample size with a smaller age range. Altogether, considering the recent and current data gathered on friendship in high-functioning children with autism (Bauminger and Kasari, 2000; Bauminger and Shulman, in press), we are only beginning to unravel the nature of friendship in autism; yet, the important value of friendships for high-functioning preadolescents' and adolescents' well-being appears unquestionable.

APPENDIX

Children's Suggested Titles for the Friendship Picture

Titles	Autism	Typical
Not including identification of friendship	• Two kids sitting • They are talking • Resting • Two boys sit and play • Good manners • Near the fence • Playing outside together • The two kids	• They are talking ($n = 2$) • Kids who prefer to be alone
Including identification of friendship	• The friends ($n = 2$) • The two friends • About friends • Kids who are friends • Two friends • Soul mates—friends for life • The friends' conversation	• Friends don't leave • The friends ($n = 3$) • Two friends are joyful and happy • The best friends ($n = 2$) • Secret friends • Brotherhood between friends • Very, very good friends • Danny and his best friend • Friends talking • Dino and Miko—good friends

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REFERENCES

American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders*, (4th edn., Rev.), American Psychiatric Association, Washington, DC.

Asher, S. R., Hymel, S., and Renshaw, P. D. (1984). Loneliness in children. *Child Dev.* 55: 1456–1464.

Asher, S. R., and Wheeler, V. A. (1985). Children's loneliness: A comparison of rejected and neglected status. *J. Consult. Clin. Psychol.* 53: 500–505.

Bauminger, N., and Kasari, C. (2000). Loneliness and friendship in high-functioning children with autism. *Child Dev.* 71: 447–456.

Bauminger, N., and Kasari, C. (2001). The experience of loneliness and friendship in autism: Theoretical and practical issues. In Schopler, E., Marcus, L., Shulman, C., and Yirmiya, N. (eds.), *The Research Basis for Autism Intervention*, Kluwer Academic/Plenum, New York, pp. 151–168.

Bauminger, N., and Shulman, C. (2003). The development and maintenance of friendship in high-functioning children with autism: Maternal perception. *Autism* 7: 81–97.

Buhrmester, D. (1990). Intimacy of friendships, interpersonal competence and adjustment during preadolescence and adolescence. *Child Dev.* 61: 1101–1111.

Bukowski, W. M., Boivin, M ., and Hoza, B. (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the friendship qualities scale. *J. Soc. Pers. Relat.* 11: 471–484.

Capps, L., Sigman, M., and Yirmiya, N. (1995). Self-competence and emotional understanding in high-functioning children with autism. *Dev. Psychopathol.* 7: 137–149.

Cassidy, J., and Asher, S. R. (1992). Loneliness and peer relations in young children. *Child Dev.* 63: 350–365.

Evans, D. W. (1998). Development of the self-concept in children with mental retardation: A review. In Burack, J. A., Hodapp, R. M., and Zigler, E. (eds.), *Handbook of Mental Retardation*, Cambridge University Press, New York, pp. 462–480.

Evans, D. W., Brody, L., and Noam, G. (1995). Self-perceptions of adolescents with and without mood disorder: Content and structure. *J. Child Psychol. Psychiatry Allied Discip.* 36: 1337–1351.

Erikson, E. (1968). *Youth and Society*, Norton, New York.

Frith, U., and Happe, F. (1999). Theory of mind and self-consciousness: What is it to be children with autism. *Mind Lang.* 14: 1–22.

Furman, W., and Bierman, K. (1983). Developmental changes in young children's conceptions of friendship. *Child Dev.* 54: 549–556.

Harter, S. (1982). The perceived competence scale for children, *Child Dev.* 55: 87–97.

Harter, S. (1983). Developmental perspective on the self system. In Hetherington, E. M. (ed.), *Handbook of Child Psychology: Socialization, Personality, and Social Development*, Wiley, New York, pp. 257–386.

Harter, S. (1985). *Self-Perception Profile for Children*, Unpublished manual, University of Denver, Denver.

Harter, S. (1990). Causes, correlates, and the role of global self-worth. In Kolligian, J., and Sternberg, R. (eds.), *Competence Considered*, Yale University Press, New Haven, CN.

Hermelin, B., and O'Connor, N. (1985). Logico-affective states and nonverbal language. In Schopler, E., and Mesibov, G. B. (eds.), *Communication Problems in Autism*, Plenum, New York, pp. 283–309.

Hobson, R. P. (1993). The emotional origins of social understanding. *Philos. Psychol.* 6: 227–245.

Howes, C. (1996). The earliest friendships. In Bukowski, W. M., Newcomb, A. F., and Hartup, W. W. (eds.), *The company They Keep: Friendships in Childhood and Adolescence*, Cambridge University Press, Cambridge, UK, pp. 86–66.

Kasari, C., Chamberlain, B., and Bauminger, N. (2001). Social emotions and social relationships in autism: Can children with autism compensate? In Burack, J., Charman, T., Yirmiya, N., and Zelazo, P. (eds.), *Development and Autism: Perspectives From Theory and Research*, Erlbaum, Hillsdale, NJ.

Lee, A., and Hobson, R. P. (1998). On developing self-concepts: A controlled study of children and adolescents with autism. *J. Child Psychol. Psychiatry* 39: 1131–1144.

Lord, C., Rutter, M., and LeCouteur, A. (1994). Autism diagnostic interview—revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *J. Autism Dev. Disord.* 19: 212–185.

Mayes, L., and Cohen, D. J. (1992). Experiencing self and others: Contributions from studies of autism to the psycholanalytic theory of social development. *J. Am. Psychoanal. Assoc.* 42: 191–218.

Neisser, U. (1988). Five kinds of self-knowledge. *Philosophical Psychology* 1: 35–59.

Parker, J. G., and Gottman, J. M. (1989). Social and emotional development in a relational context: Friendship interaction from early childhood to adolescence. In Brendt, T., and Ladd, G. (eds.), *Peer Relationships in Child Development*, Wiley, New York, pp. 95–131.

Renshaw, P. D., and Brown, R. J. (1993). Loneliness in middle childhood: Concurrent and longitudinal predictions. *Child Dev.* 64: 1271–1284.

Rogers, S. J., and Pennington, B. F. (1991). A theoretical approach to the deficits in infantile autism. *Dev. Psychopathol.* 3: 137–162.

Schopler, E. (1985). Convergence of learning disability, higher-level autism, and asperger's syndrome. *J. Autism Dev. Disord.* 15: 359–360.

Sullivan, H. S. (1953). *The Interpersonal Theory of Psychiatry*, Norton, New York.

Wechsler, D. (1974). *WISC-R Manual: Wechsler Intelligence Scale for Children—Revised*. Psychological Corporation, San Antonio, TX.

Yirmia, N., and Sigman, M. (1991). High functioning individuals with autism: Diagnosis, empirical findings, and theoretical issues. *Clin. Psychol. Rev.* 11: 669–683.