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The nature of friendship in children with autism spectrum disorders: A systematic review



Neysa Petrina*, Mark Carter, Jennifer Stephenson

Macquarie University Special Education Centre, Macquarie University, Sydney, Australia

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ABSTRACT

This paper provides a systematic review of 24 studies that addressed the characteristics of friendship in school-age children with a diagnosis of autism spectrum disorder (ASD). The following questions were addressed: who are the participants, what methodologies have been employed, and what is our understanding of friendship in children with ASD. The results of this review indicate important differences in the manifestation of friendships in individuals with ASD as compared to typical children. While there is consistent evidence for several topographical differences in friendship characteristics, a number of gaps in our knowledge are evident. These include limited data on children who have intellectual disability, and on the perspective of nominated friends as well as circumscribed data on satisfaction with friendship relationships. In addition, there are a number of methodological limitations that restrict interpretation of extant research. Implications for future studies are discussed.

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* Corresponding author at: Macquarie University Special Education Centre, Macquarie University, NSW 2109, Australia. Tel.: +61 2 9850 6923.
E-mail address: neysapetrina@gmail.com (N. Petrina).

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1. Introduction

The social milieu of children grows in complexity as they develop, starting from parent-child and sibling relationships and expanding outside the family to include peer relationships. As early as infancy, children have been shown to display a preference for a specific social partner within their peer group (Howes, 1987; Ross & Lollis, 1989). The amount of time spent interacting with friends as compared to non-friends (Rubin, Bukowski, Parker, & Bowker, 1998) and families (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996) continues to increase as children reach middle childhood. Hence, as children mature, peer relationships become increasingly important and are of interest in the study of child development.

A distinction can be made between two types of peer relationships. One involves interactions between non-friends and the other involves interactions with peers that are friends. Analysis of the interactions between friends, as compared to non-friends, has indicated that friendship relations are marked by a higher level of positive engagement, greater effectiveness of task performance, and better resolution of conflict (Newcomb & Bagwell, 1995). Friendship is a specific form of dyadic peer relationship that involves a complex set of skills incorporating knowledge in the area of social cognition, language, and emotions. It is characterised by a bond that is dynamic, stable, voluntary, and reciprocal in nature, involving a degree of mutual affection and preference, which results in the facilitation of socially related functions such as intimacy, companionship, and closeness (Freeman & Kasari, 1998; Howes, 1983; Webster & Carter, 2007).

In typically developing children, friendship has been shown to promote positive social, cognitive, and emotional development, all of which are influential in the overall sense of wellbeing (Hartup & Stevens, 1999). Children who have high quality friendships have also been shown to have a high sense of belonging at school (Hamm & Faircloth, 2005), positive perceptions of school (Ladd, 1990), a lower level of peer victimisation (Hodges, Boivin, Vitaro, & Bukowski, 1999), and better academic performance (Wentzel & Caldwell, 1997). The components of friendship and its functions continually evolve across the lifespan and are distinct within different age groups (Gilford-Smith & Brownell, 2003). For example, younger children define their friendship mostly in terms of companionship, whereas older children often emphasise the importance of self-disclosure, loyalty, and intimacy in their friendships (Rose & Asher, 2000).

The failure to develop successful peer relationships in the early years, on the other hand, has been shown to predict emotional and behavioural problems in children without developmental disabilities (Bagwell, Newcomb, & Bukowski, 1998; Hartup & Stevens, 1999). This may be because the opportunity to engage in peer interactions during the early years of life contributes to the development of fundamental skills such as communication, emotional regulation, conflict resolution, and co-operation skills, which are fundamental for successful future social relations (Hartup & Laursen, 1993; Newcomb & Bagwell, 1995).

Typical children usually acquire the basic skills necessary for social interaction simply through exposure to social situations, in which the process of implicit learning through imitation, modelling, and trial and error, take place (Meltzoff, Kuhl, Movellan, & Sejnowski, 2009). In typical children, therefore, mastery of the skills to socialise is often accomplished without many difficulties.

Persistent impairments in social interaction and communication are typical of ASD diagnosis (American Psychiatric Association, 2000, 2013). It is well documented that the majority of children with ASD experience great difficulties in developing friendships and peer relationships appropriate to their age (Fuentes et al., 2012; Hill & Frith, 2003; Sigman & Ruskin, 1999; Travis & Sigman, 1998). In comparison with typical peers, children with ASD find acquisition of basic social interactional skills a challenging process, and often these skills need to be taught explicitly (Klinger, Klinger, & Pohl, 2007).

The study of friendship relations in children with ASD as compared to typical children is complicated by the presence of large variations in cognitive, linguistic, and social development, consistent with the continuum nature of the disorder (Witwer & Lecavalier, 2008). Researchers have identified a number of core impairments in children with autism that may affect social relationships. These impairments have been hypothesised to be both cognitive and emotional (Twachtman-Cullen, 2000).

One aspect of cognitive impairment in ASD is apparent difficulty in understanding the mental states of others and hence, to some extent, in predicting their actions (Baron-Cohen, 1989). There are also impairments in executive functioning (Hill, 2006; Ozonoff, Pennington, & Rogers, 1991; Pennington & Ozonoff, 1996), which might influence problem solving ability and the abilities related to planning, remaining flexible, orienting, and attention shifting (Pascualvaca, Fantie, Papageorgiou, & Mirsky, 1998; Townsend, Harris, & Courchesne, 1996). In addition, children with autism may also show weak central coherence. That is, they may lack the ability to focus on the 'bigger picture' and may often only focus on specific parts of the situation (Frith & Happe, 1994; Happe & Frith, 2006). Thus, the cognitive impairments in children with ASD may impact on

their social ability to consider other's perspectives, to perceive and understand social and emotional cues (Lord, 1990), and to be flexible in their social encounters.

There have been a limited number of studies reviewing the nature of relationships in children with disabilities, including ASD. Travis and Sigman (1998) reviewed the impact of social deficits on interpersonal relationships in children with ASD, but they did not specifically consider the concept of friendship. Webster and Carter (2007) provided a narrative systematic review that considered the nature of friendships in children with developmental disorders but did not specifically address children with ASD, where the nature of the social deficit is distinctive.

The current paper provides a systematic review of studies that addressed the characteristics of friendship in the population of school-age children with a diagnosis of ASD. The following questions will be addressed: (a) who are the participants, (b) what methodologies have been employed, and (c) what is our understanding of friendship in children with ASD?

2. Methods

2.1. Selection of studies

Searches of the databases Academic Search Premier, Educational Resources Information Center (ERIC), and PsycINFO were carried out in June 2013, to locate suitable studies using the following search terms: ("social relationship" OR "peer relationship" OR friend\$) AND (ASD OR autis\$ OR "autism spectrum disorders") with no language and publication time limitations. The truncation symbol of * was used to replace \$ in both Academic Search Premier and ERIC.

The selection criteria were that studies need to (a) provide empirical or qualitative data, (b) be focussing on an aspect of friendship, (c) employ participants between the age of 5 and 18 years, and (d) involve individuals with a diagnosis of ASD. Studies were excluded if they focussed solely on intervention effect, rather than examining the nature of friendships (e.g., Locke, Rotheram-Fuller, & Kasari, 2012; Mavropoulou & Avramidis, 2012), or focussed on loneliness (e.g., Causton-Theoharis, Ashby, & Cosier, 2009; Lasgaard, Nielsen, Eriksen, & Goossens, 2010), or examined a subgroup of participants with a specific co-morbidity, such as obsessive-compulsive disorder (OCD). A three-stage process was employed in the selection of studies appropriate for the systematic review. At each stage two authors screened each of the potential studies and disagreements were resolved by consensus discussion.

Initially, the 954 unique potential titles and abstracts found from the broad database searches were scanned for papers addressing social relationship, peer relationship, or friendship in participants with ASD. This initial screening resulted in 266 studies being included for the second screening round (interrater reliability 94%). The second stage of the screening process identified studies that reported empirical or qualitative data, with participants between the ages of 5 and 18 years. A total number of 209 studies were excluded (interrater reliability 96%).

The full text of the remaining 57 studies was examined further. Studies were excluded if no specific data on friendships were reported (e.g., Matre, 2012); data of eligible participants could not be isolated (e.g., Cederlund, Hagberg, Billstedt, Gillberg, & Gillberg, 2008; Wainer, Block, Donnellan, & Ingersoll, 2013); the ages of all participants were not clearly stated to be in the 5–18 years range (e.g., Lee, 2010; Poon & Sui, 2012; Robert, 2001); or if the study focussed on a sub-group of participants, such as those with specific comorbidity of OCD (e.g., Mack et al., 2010). The interrater reliability of the last stage of screening was 95% and resulted in 34 studies being retained. An additional study was found from an ancestral search of the reference lists of all included studies, giving a final number of 35 studies. Of these studies, 21 specifically addressed the core issue of friendships, such as friendship quality, or the characteristics of friendship as defined by children with autism. Three studies solely examined the concept of network centrality, which provided data related to social position or standing within a group, rather than friendship per se. These studies were included into the present systematic review because they provided data on the extent of reciprocation of friendship, which was relevant to the review.

The other 11 studies provided only limited incidental information on the number of reported friends (Bossaert, Colpin, Pijl, & Petry, 2012; Hay & Winn, 2012; Knott, Dunlop, & Mackay, 2006; Koning & Magill-Evans, 2001; Lieb, 2012; Solish, Perry, & Minnes, 2010; Vicili, Weiss, Lunsky, & Shupak, 2010; Wainscot, Naylor, Sutcliffe, Tantam, & Williams, 2008) or frequency of contact (Shattuck, Orsmond, Wagner, & Cooper, 2011; Wagner, Cadwallader, Newman, Garza, & Blackorby, 2002). This systematic review will analyse the 24 studies that focussed on investigating the core issue of friendships that includes level of friendship reciprocity.

2.2. Data extraction and analysis

The following objective data were extracted for core studies: (a) participant demographics (such as age, IQ, gender, diagnosis, severity of autistic symptomology); (b) the total number of participants in each group in the study; (c) relationships measures; (d) data collection procedures (observation, interview, written questionnaire); (e) source of participants (school, government, tertiary education body, community); (f) inclusion criteria; and (g) the source of relationship data (child, nominated friend, matched peers including both typical children or those with other disabilities, teacher, parent or guardian). Interrater reliability for data extraction was 89%. In addition, conceptual and operational definitions of friendship were summarised. The studies were divided into three groups: those that provided a quantitative comparison of children with ASD and typically developing children (TDC, $n = 17$), those that provided a non-comparative

Table 1
Demographics.

	Quantitative comparative		Non-comparative quantitative	Qualitative
	ASD	Comparison group	ASD	ASD
Number of participants				
Mean	36.1	193.9	646.5	3.7
Minimum number of participants	7	11	91	1
Maximum number of participants	100	815	1202	7
Total number of participants	614	3296	1293	15
Gender (%)				
Boys	32 (88.8)	80 (50.8)	556 (86.0)	4 (92.3)
Girls	4 (11.1)	77 (49.1)	91 (14.0)	0.3 (7.7)
Missing data	2	4	0	1
Age				
Mean	10.34	10.82	11.95	13.94
Missing data	2	5	0	1
IQ				
Mean IQ	89.8	103.1	92.4	0
Missing data	7	13	1	4

quantitative examination of the nature of friendships in individuals with ASD ($n = 3$), and those that provided a qualitative examination of the nature of friendships in individuals with ASD ($n = 4$).

3. Results

3.1. Participants and settings

Table 1 provides a summary of the participant demographic characteristics. The average number of participants across quantitative comparative studies ($M = 89.5$) and quantitative non-comparative studies ($M = 105.9$) was predictably greater than the qualitative studies ($M = 2.1$). The mean age in years of participants in both comparative and non-comparative quantitative studies was lower ($M = 10.9$ and $M = 11.3$, respectively) than the mean age of participants within the qualitative studies ($M = 13.9$). As would be anticipated, a higher male-to-female ratio was observed across all studies (i.e., 4:1). Researchers in two qualitative studies (Daniel & Billingsley, 2010; Howard, Cohn, & Orsmond, 2006) recruited only male participants. IQ level across participants with ASD in both comparative and non-comparative quantitative studies was reported to be within the normal range. IQ data were not reported for any of the participants in the qualitative studies. In terms of diagnosis, 81% of participants in the quantitative comparative studies were diagnosed with autistic disorder, whereas 95% of participants in the quantitative non-comparative studies were reported with the broader diagnosis of ASD. In the qualitative studies, 73% of participants were diagnosed with Asperger's syndrome. Only Kuo, Orsmond, Cohn, and Coster (2013) reported the existence of comorbidity in their sample. The majority of studies examined friendship relations that occurred within regular school settings.

Of the 17 comparative studies, 15 compared children with ASD to typical peers or classmates matched in terms of age, gender, IQ scores, and maternal education. Two research studies, Boutot and Bryant (2005) and Rowley et al. (2012), compared pattern of peer relationships in participants with ASD to that of participants with other disabilities, such as speech and language impairment, learning disability, intellectual disability, traumatic brain injury, hearing impairment, and multiple disabilities.

3.2. Methodology

The procedures used for each study are summarised in Table 2. Standardised measures such as the Friendship Quality Scale (FQS) (Bukowski, Hoza, & Boivin, 1994) or the Friendship Quality Questionnaire (FQQ) (Parker & Asher, 1993) were used to gather quantitative data on friendship quality, with the FQS being used more often than the FQQ. All studies that used the FQS measured and reported all five subscales of the FQS in their analysis with the exception of Bauminger, Solomon, & Rogers (2010), who reported only the FQS subscales of security-intimacy, closeness, and conflict. In addition, participant subjective perception of friendship was investigated in several studies by asking them either to (a) define what a friend is, (b) list qualities desirable in a friend, or (c) express what friendship means to them.

Researchers used a combination of data collection procedures that included written questionnaires, interviews, and observations of friendship relations. Written questionnaires were used most commonly across both the comparative and non-comparative quantitative studies. Written questionnaires alone were used in seven comparative quantitative studies (Bauminger & Shulman, 2003; Boutot & Bryant, 2005; Chamberlain, Kasari, & Rotheram-Fuller, 2007; Lee, 2009;

Table 2
Summary of procedures utilised to investigate friendships of children with autism.

Studies	Relationships measures	Data collection method			Recruitment/selection process		Source of relationship data				
		Observation	Interview	Written questionnaire	Sources of participants	Inclusion criteria	Target Child	Nominated friend	Typical children/other disabilities	Teacher	Parent(s)/ guardian
<i>Comparative quantitative studies</i>											
Bauminger and Kasari (2000)	Friendship Qualities Scale Loneliness Rating Scale		✓	✓	Schools, tertiary education clinic, community	Meeting the criteria for autistic disorder as described in DSM-IV	✓		✓		✓
Bauminger and Shulman (2003)	Parental reports Early Childhood Friendship Survey			✓	Government, schools	Meeting the criteria for autistic disorder as described in DSM-IV, developmental delay or deviance need to be evident prior to the age of 36 months, meeting the criteria for autism on all four ADI-R domains					✓
Bauminger et al. (2004)	The Friendship Picture Recognition Interview, Friendship Qualities Scale, The Loneliness Rating Scale		✓	✓	Government, schools	Meeting the criteria for autistic disorder as described in DSM-IV, developmental delay or deviance need to be evident prior to the age of 36 months, meeting the criteria for autism on all four ADI-R domains	✓		✓		
Boutot and Bryant (2005)				✓	School	Children in grades two to five	✓		✓		
Rotheram-Fuller (2006)	Friendship Qualities Scale Friendship survey Teacher Perceptions Questionnaire			✓	Schools, community	Not stated	✓		✓	✓	
Chamberlain et al. (2007)	Friendship Qualities Scale Loneliness Rating Scale Friendship survey, classroom observations, parental reports, teacher questionnaires			✓	Schools	Children with autism that were enrolled in regular classes	✓		✓	✓	✓
Bauminger, Solomon, Aviezer, Heung, Gazit et al. (2008)	Friendship Observation Scale Dyadic Relationship Q-Set Friendship Qualities Scale Mother interview	✓	✓	✓	Previous studies, schools, community	Clinical diagnosis of Autistic disorder or Asperger syndrome, receptive vocabulary level score of 80 or above, normative reading comprehension level, an identified close friendship of at least 6 months duration that included friendship activities outside school time	✓	✓	✓		✓

Table 2 (Continued)

Studies	Relationships measures	Data collection method			Recruitment/selection process		Source of relationship data				
		Observation	Interview	Written questionnaire	Sources of participants	Inclusion criteria	Target Child	Nominated friend	Typical children/other disabilities	Teacher	Parent(s)/ guardian
Bauminger, Solomon, Aviezer, Heung, Brown et al. (2008)	Friendship Observation Scale Dyadic Relationship Q-Set Kerns Security Scale Mother interview	✓	✓	✓	Previous studies, schools, community	Children with prior clinical diagnosis of high functioning ASD or Asperger syndrome, with an age range in between eight and 12 years, possessing a VIQ of 80 or above, normative reading comprehension level, and an identified friend of at least 6 months that included spending time together outside school time	✓	✓		✓	✓
Lee (2009)	Friendship Qualities Scale Friendship survey			✓	Previous studies	Children with diagnosis of ASD or Asperger's syndrome between the age of six to 12 years, high functioning, attending regular classes, no additional diagnosis or sensory or motor impairments	✓		✓		
Whitehouse et al. (2009)	Friendship Quality Questionnaire Friendship Motivation Questionnaire De Jong-Gierveld Loneliness Scale			✓	Schools	Adolescents that met the DSM-IV criteria for ASD and currently attending mainstream secondary schools	✓		✓		✓
Locke et al. (2010)	Loneliness Scale Friendship Qualities Scale Friendship survey School activity questionnaire		✓	✓	School	Previous clinical diagnosis of ASD, possessing conversational speech and minimal behaviour problems	✓		✓		
Bauminger et al. (2010)	Friendship Qualities Scale Dyadic Relationship Q-Set Kerns Security Scale Inventory of Parent and Peer Attachment	✓		✓	Previous study, schools, community	DSM-IV diagnosis, ADI-R score within the autism range, a VIQ of 80 or above on the Peabody Picture Vocabulary Test, normative reading comprehension level, possessing an identified friend of at least 6 months' duration with whom the target child spent time together outside of school	✓		✓		✓
Kasari et al. (2011)	Friendship Qualities Scale Friendship Survey Playground Observation of Peer Engagement Teacher Perception Measure	✓	✓	✓	Schools	Met the criteria for ASD on the ADI-R and ADOS, fully included in regular education classroom for at least 80% of the school day, between the age of 6–11 years old, in grade 1–5, had an IQ of 65 or higher, and no additional diagnosis	✓		✓		✓

Rotheram-Fuller et al. (2010)	Friendship survey		✓		Schools, community	A diagnosis of ASD	✓		✓	
Solomon et al. (2011)	Friendship Qualities Scale Dyadic Relationships Q-Set	✓		✓	Previous study	Diagnosis of high functioning ASD or Asperger syndrome, between the age 8 to 12 years, a receptive language score of 80 or above as assessed by the Peabody Picture Vocabulary Test Third Edition, normative reading comprehension level based on the reading subtest of the Ma'akav, and have an identified close friend of at least 6 months	✓	✓		✓
Rowley et al. (2012)	Parental reports Teacher reports ADOS-G Module 3		✓	✓	Previous study	Diagnosis of childhood autism according to the International Classification of Diseases (ICD-10), verbally fluent in spoken English	✓		✓	✓
Calder et al. (2012)	Friendship Quality Scale Cognitive Mapping Semi-structured interview with children with autism, parents and teachers	✓		✓	Schools	Diagnosis of ASD according to ICD-10 or DSM-IV criteria, scoring above threshold for autism on the Social Communication Questionnaire, attending mainstream primary schools (Year 5 and 6)	✓		✓	✓
<i>Non comparative quantitative</i>										
Lyons, Cappadocia, & Weiss (2011)	Parental reports			✓	Community	Parents of students with ASD				✓
Mazurek and Kanne (2010)	Child Behaviour Checklist; Autism Diagnostic Interview-Revised ADOS		✓	✓	Previous study	Children ranging between 4 and 17 years who participated in the Simons Simplex Collection, come from a family with only one child with an ASD	✓			✓
Kuo et al. (2013)	The Friendship Qualities Scale; Adolescents activity reports (Adolescents' completed questionnaire about their relationship with their best friends); Lifetime form of The Social Communication Questionnaire; Parents' interview on their children's friendships			✓	Community, schools	Participants performs at a level of 5th grade of higher for reading, had been diagnosed with an ASD by a licensed professional, and scored 15 points or higher on the lifetime form of the Social Communication Questionnaire	✓			✓

Table 2 (Continued)

Studies	Relationships measures	Data collection method			Recruitment/selection process		Source of relationship data					
		Observation	Interview	Written questionnaire	Sources of participants	Inclusion criteria	Target Child	Nominated friend	Typical children/other disabilities	Teacher	Parent(s)/guardian	
<i>Qualitative</i> Carrington et al. (2003)	Semi-structured interviews		✓		Schools	Secondary school students with a diagnosis of Asperger syndrome	✓					
Howard et al. (2006)	Semi structured interviews with adapted items from the Youth Quality of Life Instrument–Research Version and adapted items from Friendship Qualities Scale		✓		Community	Not stated	✓					✓
Daniel and Billingsley (2010)	Semi-structured interviews with the boys, parents, and school affiliated adults		✓		Community, schools	Age 10–14 years old, have good verbal communication, IQ in the normal to above normal range	✓				✓	✓
Rossetti (2011)	Semi-structured interviews; Observation (ethnographic method)	✓	✓		Community	High school students and young adults who formed friendships outside of formal friendship groups	✓	✓				

Rotheram-Fuller, 2006; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010; Whitehouse, Durkin, Jaquet, & Ziatas, 2009). Written questionnaires were complemented by other methods of data collection such as interviews or observations in 65% ($n = 11$) of quantitative comparative studies and in all of the quantitative non-comparative studies. Observational data were reported less often with only six comparative quantitative studies and one qualitative study reporting such data.

All studies that were included in this systematic review incorporated multidimensional perspectives of friendship. That is, in addition to the relationship data gathered from the children and adolescents with autism, researchers also gathered data from matched typical peers, nominated friends, teachers, and/or parents or guardians. Investigators from ten out of 17 quantitative comparative studies utilised three or more sources in their examination of friendship characteristics. Additionally, at least two sources were used across all the non-comparative quantitative studies and three out of four qualitative studies.

3.3. Definitions of friendship

Basic to the understanding of friendship and the identification of potential friends is the way friendship is defined. A conceptual definition of friendship was offered in three out of 24 studies (Bauminger & Shulman, 2003; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Chamberlain et al., 2007), and operational definition was provided for three other studies (Bauminger et al., 2010; Howard et al., 2006; Rossetti, 2011). Researcher agreement on the conceptual definition of friendship was summed up by Bauminger, Solomon, Aviezer, Heung, Gazit, et al. (2008) as “stable, frequent, and interconnected affective interactions that are manifested by certain classes of behavioural markers (e.g., sharing, play and conversational skills) that facilitate the functions of companionships, intimacy, and closeness” (p. 136). In terms of operational definitions, researchers described specific behavioural manifestations of friendship, such as a mutual relationship that has lasted for a defined period of time (e.g., at least six months) and friendship activities that also occurred out of school or structured settings, based on maternal report and verified by the friend (Bauminger, Solomon, Aviezer, Heung, Brown et al., 2008; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Bauminger et al., 2010). Apart from the three studies where an operational definition of friendship was provided, nomination of a friendship by the child with ASD was accepted as evidence for the existence of the friendship.

3.4. Findings

Four broad research foci were identified in the studies reviewed. Specifically, these were (a) friendship characteristics, (b) definitions of friendship, (c) friendship quality, (d) reciprocity of friendship, and (e) friendship satisfaction. These will now be considered in turn.

3.4.1. Friendship characteristics

There were a variety of measurable characteristics of friendships reported across studies in this systematic review. These included number of friends, frequency of contact, activity patterns, duration of friendships, and characteristics of friends (e.g., gender, age, disability status).

Data from quantitative comparative studies suggested that children and adolescents with ASD had fewer friends than matched typical peers (Bauminger & Shulman, 2003; Rowley et al., 2012). Although children with ASD were reported to have fewer friends, researchers reporting in both quantitative and qualitative non-comparative studies provided evidence that 80% and more of children and adolescents with ASD reported having at least one friend (Daniel & Billingsley, 2010; Kuo et al., 2013).

Parent or guardian estimates on frequency of friendship contact were reported in three comparative studies. Participants with ASD were reported to have lower frequency of contact with their friends outside of school compared to their typical peers (Bauminger, Solomon, Aviezer, Heung, Brown et al., 2008; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Bauminger & Shulman, 2003).

The pattern of friendship activity in children and adolescents with ASD was examined in two quantitative comparative studies and one quantitative non-comparative study. Parents of children with ASD reported that their children spent the majority of their time with friends playing games, mainly video games and board games, followed by physical activities, or playing on the computer (Bauminger & Kasari, 2000; Bauminger & Shulman, 2003). Similar findings were also reported by Kuo et al. (2013), in that adolescents with ASD reported spending the majority of their time with friends playing video games, followed by physical activities, watching television, playing, and engaging in conversation. The association between friendship activity and friendship quality was explored by Kuo et al. (2013), who found that adolescents reported greater overall positive friendship qualities and higher degree of companionship when they spent their time together playing video games, compared to those who did not play video games with friends.

Children with ASD in comparative studies were reported to have a shorter duration of friendship when compared to matched typical peers. The difference in friendship duration in months was found to be statistically significant in Bauminger and Shulman (2003; $M = 21.80$ compared to $M = 44.57$), but not so in Bauminger, Solomon, Aviezer, Heung, Gazit, et al. (2008; $M = 40$ compared to $M = 49.11$). However, investigators in two qualitative studies (Daniel & Billingsley, 2010; Rossetti, 2011) described nine adolescents with autism in their sample group who had maintained friendships with one or two close friends from three to up to six years.

Children and adolescents with ASD more often have friends with disabilities than typically developing children (Bauminger & Kasari, 2000; Bauminger & Shulman, 2003; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Locke, Ishijima, Kasari, & London, 2010). Friends of participants with ASD were reported to be of a similar age and gender in four out of seven studies that provided such data (Bauminger & Shulman, 2003; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Daniel & Billingsley, 2010; Kuo et al., 2013) and mixed gender friendships were identified in only two studies (Chamberlain et al., 2007; Solomon, Bauminger, & Rogers, 2011).

3.4.2. Understanding and definition of friendship by children

Three quantitative comparative and three qualitative studies examined the understanding and definitions of friendship of participants with ASD. In comparison to typical peers, fewer participants with ASD provided a complete definition of friendship that incorporated the three central dimensions of affection, intimacy, and companionship (Bauminger & Kasari, 2000). Both younger and older participants reported companionship as a basic component of their friendship relations (Calder, Hill, & Pellicano, 2012; Carrington, Templeton, & Papinczak, 2003). Participants in the qualitative study conducted by Daniel and Billingsley (2010) further defined companionship as completing mutually enjoyable activities together and having similar interests. Additionally, in qualitative studies with older participants, aspects of mutual help and protection from victimisation, and similarity in personality were included as part of definitions of friendship (Howard et al., 2006; Rossetti, 2011).

3.4.3. Friendship quality

Friendship quality was measured in 10 out of 16 comparative studies using either the Friendship Qualities Scale (FQS) (Bukowski et al., 1994), which was used in nine studies or the Friendship Quality Questionnaire (FQQ) (Parker & Asher, 1993), which was used in one study. Table 3 presents the levels of FQS subscales, namely companionship, security-intimacy, closeness, help, and conflict, as reported by children and adolescents with ASD compared to those of matched typical peers and typical children. Information is provided on whether participants with ASD scored lower or higher than typically developing children and whether reported differences were statistically significant or not.

As evident from Table 3, children and adolescents with ASD reported lower levels of companionship, security-intimacy, closeness, and help than their matched typically developing peers, with the majority of differences reaching significance. An interesting finding was that there was no significant difference within the subscale of conflict in all of the nine studies although this was the only sub-scale in which higher scores were reported for individuals with ASD in some studies.

Further investigation into the correlation between age and friendship quality was conducted by Bauminger, Solomon, Aviezer, Heung, Gazit et al. (2008). They found that younger children with high-functioning autism reported a higher level of friendship quality as compared to the older participants. In addition, the level of companionships and help reported were negatively correlated with age. The opposite was true for level of conflict.

3.4.4. Reciprocity of friendship

Reciprocity was examined in terms of friendship nominations in studies examining network centrality. In comparison with typically developing matched peers, children and adolescents with ASD had a consistently lower level of reciprocity across nominations of top three friends and best friends (Chamberlain et al., 2007; Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011; Lee, 2009; Rotheram-Fuller, 2006; Rotheram-Fuller et al., 2010). That is, friendships that were reported by individuals with ASD were less likely to be reciprocated by the nominated friend. Calder et al. (2012) reported that six out of 10 mothers also described their child's friendship to be lacking in reciprocity. Rotheram-Fuller et al. (2010) compared the level of reciprocal best friendships in students with autism across different grades. They discovered that children in early grade

Table 3
Results from Friendship Qualities Scale (FQS; Bukowski et al., 1994).

Study	No of participants		Companionship				Security-intimacy				Closeness				Help				Conflict				
	ASD	CG	L	H	s	ns	L	H	s	ns	L	H	s	ns	L	H	s	ns	L	H	s	ns	
Bauminger and Kasari (2000)	22	19	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bauminger et al. (2004)	16	16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bauminger, Solomon, Aviezer, Heung, Gazit et al. (2008)	44	38	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bauminger et al. (2010)	44	38	-	-	-	-	•	•	•	•	•	•	•	•	-	-	-	-	•	•	•	•	•
Calder et al. (2012)	12	11	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Chamberlain et al. (2007)	16	17	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Kasari et al. (2011)	56	60	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lee (2009)	4	34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Locke et al. (2010)	7	13	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Solomon et al. (2011)	20	22	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Note: ASD = children with autism spectrum disorder; CG = comparison group; L = lower score for children with ASD; H = higher score for children with ASD; s = statistically significant; ns = not statistically significant; - = value was not provided.

groups were similar to typical peers in the amount of best friendships reciprocation. As age increased, children with ASD showed significantly lower levels of reciprocal best friendships.

3.4.5. Satisfaction

Semi-structured interviews conducted by [Calder et al. \(2012\)](#) suggested that even though children with autism reported a small number of friends, 11 out of 12 of these children stated they were satisfied with their friendships.

4. Discussion

The present review systematically examined the characteristics of close peer relationships in children and adolescents with ASD. Several questions were addressed, focussing on (a) the characteristics of the participants, (b) the methodologies employed, and (c) our current understanding of friendship in children with ASD.

4.1. Participants

A notable feature of the examined research was the lack of diversity in participants. The majority of researchers recruited high-functioning participants with levels of intelligence in the normal range. Some epidemiological studies have indicated that participants with ASD with average and above average intelligence make up only 31% of individuals with ASD ([Charman et al., 2011](#); [Fombonne, 2003](#)) suggesting that existing research has focussed on a limited subset of children with ASD.

In terms of age, participants were mostly either in middle childhood or young teenagers. It was interesting that participants in the qualitative studies were substantially older than those whom other research examined. It is possibly that older participants were more likely to be selected in qualitative studies because of the typically more nuanced nature of questioning. While research examining younger children and those with intellectual disabilities is undoubtedly more challenging for researchers, the current corpus of research is highly unrepresentative of children with ASD as a whole. Thus, future studies with younger age groups of participants across different intellectual levels will be important in order to provide a fuller picture of peer relationships in children with ASD.

4.2. Methodology

Information on friendship characteristics, including the number of friends, duration of friendship, and friendship activity patterns was primarily gathered from interviews with parents. Comparison of the data from children and parents revealed some contrasting findings. For example, children and adolescents with ASD reported higher numbers of friends, compared to parent reports in two studies ([Knott et al., 2006](#); [Kuo et al., 2013](#)). In contrast, [Bauminger and Kasari \(2000\)](#) found that mothers reported greater number of friends compared to child reports. Only one study ([Calder et al., 2012](#)) provided data suggesting that the child account of the number of friends was consistent to their parent reports. Thus, the extensive reliance on parents as informants regarding friendships may be problematic, particularly where contact with friends primarily exists in the school setting ([Webster & Carter, 2013](#)). Thus, it may be appropriate for future researchers to consider collecting data from multiple sources, including the children with disabilities, their nominated friends, teachers, and parents, in order to triangulate findings.

A related consideration and perhaps the most basic measurement issue is the determination of the existence of a friendship. Despite evidence of disagreement across multiple informants, most researchers tended to accept nominations of friendships on a face value. The exceptions to this was the study conducted by [Kuo et al. \(2013\)](#), in which agreement on nomination between best friends and top three friends nominated by adolescents with ASD and their parents was calculated. They found 60% agreement for the nominated best friends and 24% agreement on the adolescents three closest friends. Secondly, [Bauminger, Solomon, Aviezer, Heung, Brown et al. \(2008\)](#), [Bauminger, Solomon, Aviezer, Heung, Gazit et al. \(2008\)](#) and [Bauminger et al. \(2011\)](#) validated the existence of friendship using verification provided by mothers and nominated friends.

Data on friendship quality was typically measured using the FQS, and researchers in only five studies using this instrument complemented their data collection by gathering additional information on patterns of dyadic interactions in either a structured ([Bauminger, Solomon, Aviezer, Heung, Brown et al., 2008](#); [Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008](#); [Bauminger et al., 2011](#)) or a naturalistic setting ([Calder et al., 2012](#); [Kasari et al., 2011](#)). Friendship is characterised by longitudinal interaction, as well as features that may be difficult to assess observationally ([Webster & Carter, 2007](#)). Nevertheless, such observational data can provide direct confirmation of behaviours that may be associated with friendship and are not filtered by participant perceptions, as is the case with report data. Thus, a greater focus on observational data of interactional patterns related to friendship may be useful in future research.

4.3. Understanding of friendships

4.3.1. Friendship characteristics

A number of congruent features of friendship manifestation in participants with ASD were evident in the present review. In comparison to matched typical peers, participants with ASD were more likely to have fewer friendships and lower

frequency of meeting outside of school (Kuo et al., 2013). Although previous studies reported that children with other disabilities have fewer friends compared to typical peers (e.g., Wiener & Schneider, 2002), there is evidence to suggest children with ASD have the lowest number of reported friendships of all disability groups (Rowley et al., 2012; Solish et al., 2010). The majority of comparative studies also reported a lack of relationship stability as indicated by lower duration of friendship as compared to typical peers (Bauminger & Shulman, 2003; Rowley et al., 2012). Participants with ASD were reported to be more likely than their typical peers to have friends with ASD or other disabilities (Bauminger & Kasari, 2000; Bauminger & Shulman, 2003; Bauminger, Solomon, Aviezer, Heung, Gazit et al., 2008; Kuo et al., 2013; Locke et al., 2010). Taken together, these data suggest that there are important differences in the manifestation of friendships in individuals with ASD as compared to typical children.

Similar preferences for friends and activity patterns were observed across typical children and those with autism. Both preferred friends that were of the same age and gender (Bauminger & Shulman, 2003). In two studies, mothers reported that children with ASD most frequently chose friendship activities that centred mostly on games with minimal interactions. Playing video games or board games, watching TV or videos, and playing on the computer were frequently reported activities (Bauminger & Kasari, 2000; Bauminger & Shulman, 2003; Kuo et al., 2013). A high level of consistency was found between children with autism and their mothers in their accounts of friendship activity pattern. Patterns of friendship activity, as reported by their mothers, were highly similar in typically developing children, with playing on the computer and watching TV nominated as frequent activities performed with friends (Bauminger & Shulman, 2003). Furthermore, results from recent studies investigating patterns of time use after school in typical children mirrored the pattern of friendship activity in children and adolescents with ASD (Ferrar, Olds, & Walters, 2011; Stanley, Ridley, & Olds, 2011).

In summary, the friendship characteristics of children with autism differ to those of matched peers and typical children in terms of their number of friends, frequency of meeting outside of school, friendship duration and stability, and the disability status of their nominated friends. However, similarity was observed across preference of age and gender of friends as well as on the type of activity conducted during friendship interactions.

4.3.2. Perception of friendship

Children and adolescents with ASD demonstrated limited ability to identify and define basic components of friendships. As previously suggested by Lord and Magill (1989), difficulty describing the concept of friendship may be characteristic of ASD. Whereas typical children gave fuller definitions of friendship that incorporated multiple dimensions, Bauminger and Kasari (2000) and Calder et al. (2012) suggested that the majority of children with ASD defined friendship in terms of companionship, while only some children included components of affect and emotion.

Carrington et al. (2003) reported that participants in their study showed great difficulty in describing their understanding of what constitutes friendship. The researchers proposed that either their difficulty in comprehending the meaning of words used in the questionnaire or their struggle with processing oral information could have contributed to their participants' failure to engage in an in-depth discussion regarding the meaning of friendship. Given the documented difficulties many individuals with ASD have with non-literal language (Kjelgaard & Tager-Flusberg, 2001; Martin & McDonald, 2004), it is possible that communication issues may be associated with difficulty in the discussion of the abstract concepts associated with friendship. Thus, researchers need to be cognisant of this possibility.

Participants with ASD in the Daniel and Billingsley (2010) and Howard et al. (2006) studies also included behaviours reflecting companionship quality, such as sharing interests and participating in common activities, as part of their broader friendship definition. Studies that looked at teenagers with developmental delays also suggested similar patterns in their responses. Interestingly, friendship research in typical children found that only younger children focussed heavily on companionship as an aspect of their friendship. As they develop in age, typical children tend to report other aspects of friendship such as loyalty and helpfulness as important components of their friendships (Newcomb & Bagwell, 1995; Rose & Asher, 2000). Available evidence supports the contention that children and adolescents with ASD possess a less developed understanding of friendship compared to their typically developing peers, possibly reflecting underlying deficits in social understanding.

It is also worthy to note that the degree of understanding in friendships qualities did not necessarily translate into behaviour. Locke et al. (2010) found that even though participants with ASD in their studies possessed some knowledge of qualities that make a good friend, they still failed to apply this knowledge in shaping their own traits as a good friend. Calder et al. (2012) also reported failure in the application of knowledge of friendship skills.

4.3.3. Friendship quality

Most studies that used the FQS and provided comparative information on friendship quality have found that generally participants with ASD reported lower levels of companionship, security-intimacy, closeness, and help, compared to matched typically developing peers, with the majority of differences reaching statistical significance (e.g., Bauminger & Kasari, 2000; Bauminger, Shulman, & Agam, 2004; Kasari et al., 2011). The level of conflict, however, was not statistically different across groups of typical peers and participants with ASD.

Whitehouse et al. (2009), who employed the FQQ (Parker & Asher, 1993) to measure friendship quality, reported a significantly higher level of conflict-betrayal in the ASD group compared to the typical peers. This result contrasted with the conflict level measured using the FQS that suggested no significant difference across children with ASD and typically developing children. The difference in results across the two relationship measures might be attributed to the two additional

questions found in the subscale on conflict for the FQQ. The two additional questions were added by [Parker and Asher \(1993\)](#) to measure the participant's perceived level of loyalty and trust within friendship relations. [Carrington et al. \(2003\)](#) suggested that both loyalty and trust were closely related to intimacy. For that reason, the seemingly inconsistent level of conflict reported might indicate that children with ASD were more likely to perceive their relationship to be lower in intimacy, which might impact their perception of loyalty and trust within their friendship.

Taken as a whole, these data suggested that children and adolescents with ASD perceived their relationship with their best friend to be of a lower quality compared to typical children. The pattern of lower quality friendship has also been observed in the broader population of children with developmental disabilities across all four dimensions of the FQQ, with conflict as the only exception ([Webster & Carter, 2010a](#)).

The consistency of lower friendship quality in children with autism compared to typical peers, even when level of intelligence and verbal performance were controlled, is not unanticipated. There are several possible explanations. ASD is a complex neurological disorder that impacts overall functional development and also affects the ability to engage in intimate and meaningful social interactions. Deficits in social communication and interaction, further exacerbated by the presence of behavioural inflexibility, may affect friendship formation. As previously noted, a number of specific deficits, including theory of mind ([Frith, Happe, & Siddons, 1994](#)), central coherence ([Frith & Happe, 1994](#)), and executive functioning ([Ozonoff et al., 1991](#)), may provide mechanisms that in part explain these deficits in forming friendships. Another possible explanation might be that children with ASD perceive the role of friendship differently than typical children. As previously discussed, children with ASD tend to have less sophisticated and more concrete notions of friendship. This narrower understanding of friendship, with correspondingly different expectations and priorities, might impact on the measured quality of their friendship on standardised scales.

4.3.4. Reciprocity of friendship

There was lack of examination of friendship reciprocity amongst the studies reviewed, despite the fact that friendship is typically defined as reciprocal in nature ([Whitehouse et al., 2009](#)). Six out of 23 studies reported reciprocity only in terms of friendship nomination, by calculating the percentages where the target child and named peer nominated each other as either best friends or in the top three friendships. This provided information on perceived reciprocity with regard to the existence of the friendship but none of the included studies provided in-depth investigation of the nominated friends' viewpoints of the friendships. Given the previously discussed differences in understanding of the nature of friendships by children with ASD, gaining such information may provide an understanding of mismatches that may affect relationship quality and satisfaction, from the perspective of both parties.

4.3.5. Satisfaction

Only one study ([Calder et al., 2012](#)) specifically examined satisfaction, and the researchers found that the majority of children with autism stated they were satisfied with their friendships even though they reported fewer friends compared to typical peers. Given that children with ASD may perceive friendship differently to typically developing students, it is possible that their friendships may differ from those of typically developing children but still meet their individual social needs. Given the dearth of data on satisfaction with friendships, this would seem to be a fertile area for future research.

5. Implications for future research

In summary, there is clearly a need for broader sampling with regard to both age and intellectual ability in the examination of friendships in children with ASD. The majority of friendship studies have investigated children in middle childhood with high-functioning autism. Since ASD varies widely in its level of severity, it is therefore necessary to investigate across a wider age group of children and adolescents with varying degree of autistic symptomatology. In particular, although methodological challenges are likely to be encountered in conducting research with children with intellectual disabilities, these difficulties are surmountable (see [Webster & Carter, 2010b](#)).

Data on friendship characteristics were mostly gathered in a subjective manner through either interview or written questionnaires. Future researchers should consider more objective data collection by incorporating greater use of direct observation of friendships in natural settings. Furthermore, all of the studies examined in this review were cross-sectional in nature, and longitudinal research has the potential to offer us a better understanding of how close peer relationships evolve over time.

Researchers have, for the most part, taken on face-value the friendship nominations by children with ASD, despite some evidence suggesting these nominations may not be reciprocated by the child nominated and in the knowledge that children with ASD may have limited understandings of the concept of friendship. It is recommended that researchers consider the use of operational definitions of friendship and seek to triangulate friendship nominations among multiple sources. There appears to be a lack of data on reciprocation in two senses. First, only a limited number of studies have examined the extent to which friendship nominations are reciprocated by the nominated peer. This is a critical consideration given that the concept of friendship is based on the notion of reciprocation. Second, we have limited data on the perspectives of both parties in friendship dyads. Such information is important in understanding either the match or mismatch of perspectives. Ultimately, probably the most important characteristic of friendship is the degree of satisfaction that it provides to participants. We have clear evidence that children and adolescents with ASD may understand the concept of friendship

differently. One study provided data suggesting that, despite having a smaller number of friends, children with autism were still satisfied with their current friendships. Thus, it remains possible that relationships that do not have the same features or measured quality as those that occur between typically developing children may still meet the needs of these individuals with ASD. Further research into satisfaction with friendships is warranted.

Finally, research has been emerging investigating specific features of ASD and their relation to social impairment and friendship quality (Lieb, 2012; Solomon et al., 2011). Nevertheless, there remains a need for further investigation of the relationship between aspects of friendship (such as satisfaction and quality) and characteristics of ASD (such as executive functioning, central coherence, theory of mind).

6. Conclusion

This systematic review has provided a summary of the current state of knowledge on the characteristics of friendship in children and adolescents with ASD. A clearer picture of the nature of friendship in children with ASD is emerging, but several gaps are evident in our knowledge. These include limited data on children who have intellectual disability, restricted information on the perspective of nominated friends, and circumscribed data on satisfaction with friendship relationships. A number of methodological limitations are evident in extant research including issues with verification of friendship nomination and extensive reliance on report measures. Future research should include confirmation from the nominated friend that a friendship exists and should also make more use of observational measures.

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