The Characteristics and Nature of Friendship in Children with Autism Spectrum Disorder

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Requirements and Format of a Thesis by Publication

This statement provides an overview of the requirements and format of a thesis by publication, in relation to University and Departmental requisites.

A thesis by publication must form a distinct contribution to knowledge either by the discovery of new facts or by the exercise of independent critical power. The thesis as a whole should be focussed on a single project or set of related questions and should present an integrated body of work, reflecting a coherent program of research.

The basic structure of a thesis by publication is as follows:

- An introduction providing a coherent overview of the background of the thesis, the research questions and the structure and organisation of the remaining chapters. The distinct contribution the thesis should be clearly identified.
- A number of chapters each written in the format of self-contained journal articles. These chapters should be published, in press or submitted. Where articles are published, they do not need to be reformatted for inclusion in the thesis. Each chapter should be prefaced by a brief introduction outlining how the chapter fits into the program of research and, in the case of jointly authored chapters, the student's contribution should be clearly specified.
- The final chapter should provide an integrative conclusion, drawing together all the work described in the other parts of the thesis and relating this back to the issues raised in the Introduction.

The length for a thesis completed at the Macquarie University Special Education Centre should generally be 50,000-75,000 words for a Doctorate and 25,000-40,000 words for a Master of Philosophy.

Synopsis

Autism spectrum disorders (ASD) are of growing concern worldwide, with an estimated prevalence of 1 in 68 children in U.S. diagnosed with ASD by the age of 8 years old (CDC, 2014). Social and communicative deficits in ASD have garnered considerable interest but research on friendship has emerged more slowly. This thesis provides an examination of several different aspects of friendship in children with ASD including the characteristics of friendship, perceptions of friendship quality, friendship satisfaction, and parent and teacher perceptions of the importance of friendships.

The initial chapter provides background to the area of study, addresses conceptual and theoretical issues, and provides an overview of the thesis. In addition, research questions are presented.

In the second chapter, a systematic review of existing research addressing the characteristics of friendship in school-age children with a diagnosis of ASD is presented. The findings from the review indicate consistent evidence for several topographical and qualitative differences in friendship characteristics across children with ASD as compared to typical children. Several areas for future research are identified, including some explored in subsequent chapters in the thesis.

A research study examining perception of friendship quality is presented in Chapter 3. Given the dyadic nature of friendships, it was of specific interest to investigate the level of similarity of perception of friendship quality between children with ASD and their friends. This represented the first study of this nature to be conducted. Forty-five children with ASD between the age of 6.4 and 10.4 years old participated, together with their nominated friends. Substantial differences in perceptions of friendship quality were found when the absolute difference in perception

scores between children with ASD and their nominated friends were calculated. A number of recommendations are identified for future research.

Chapter 4 includes a study examining the issue of friendship satisfaction in children with ASD and their friends. Differences in friendship characteristics for children with ASD compared to typically developing children have been reported. These differences, however, need to be interpreted in relation to the expectations and degree of satisfaction of the children in the relationship. Consequently, a quantitative study examining the friendship satisfaction of children with ASD and their friends, in friendships both with typically developing peers and with other children with ASD, was carried out. There were no significant differences observed in the level of satisfaction between children with ASD and their friends (either typically developing children or those with ASD). Both groups reported quite a high level of satisfaction in their 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.

The fifth chapter presents two related studies that provide an examination of the extent to which friendships are prioritised by parents and teachers in relation to other curriculum areas. Collaboration between parents and teachers is considered important to effective education programs for children with ASD. Thus, it was of interest to determine the extent to which friendship is prioritised and the degree of agreement between parents and teachers. When examining central tendency, parents consistently rated all curriculum outcomes as more important in their children's development than did teachers. When forced to rank, mean friendship rank was similar across parents and teachers. At an individual level, however, the lowest level of absolute agreement between teachers and parents ranking was in the area of friendship. Teachers ranked

friendship skills to be of higher importance as compared to other outcome priorities than parents. This result reflects recognition of the broad learning needs of children with ASD in the areas of social and emotional development, as well as friendship, all of which may be seen as related to core socio-communicative deficits.

The concluding chapter provides summaries of findings and highlights the novel contributions that have been made in the program of research. In addition, directions for future research are summarised.

STATEMENT OF CANDIDATE

I certify that the work in this thesis entitled "The Characteristics and Nature of Friendship in Children with Autism Spectrum Disorder" has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other University or institution other than Macquarie University.

I also certify that this thesis is an original piece of research and my own work. Any help and assistance I have received in my research and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used as indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee, as part of the research project titled 'The Efficacy of Models for Educational Service Delivery for Students with Autism Spectrum Disorders', referenced number 5201100729 (approved on 6 October 2011, including amendment approved on 3 April 2014) (see appendix A).

Neysa Petrina (40538303)

May 2016

STATEMENT OF CONTRIBUTION

This is a statement of my contribution to this thesis and the jointly written papers included in it. The following is a list of the papers in conjunction with my principal supervisor Associate Professor Mark Carter and my associate supervisor Associate Professor Jennifer Stephenson.

1. Petrina, N., Carter, M., & Stephenson, J. (2014). The nature of friendship in children with autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 8*, 111-126.

I wrote this review with advice and input from Associate Professor Mark Carter and Associate Professor Jennifer Stephenson

2. Petrina, N., Carter, M., Stephenson, J., & Sweller, N. (2016). Perceived friendship quality of children with autism spectrum disorder as compared to their peers in mixed and non-mixed dyads. *Journal of Autism and Developmental Disorders, 46*, 1334-1343.

I conducted the study and wrote this research paper with the input from Associate Professor Mark Carter and Associate Professor Jennifer Stephenson. Dr. Naomi Sweller assisted with statistical analysis of the result section.

3. Petrina, N., Carter, M., Stephenson, J., & Sweller, N. (in press). Friendship satisfaction in children with autism spectrum disorder and nominated friends. *Journal of Autism and Developmental Disorders.* doi: 10.1007/s10803-016-2970-7.

I conducted the study and wrote this research paper with the input from Associate Professor Mark Carter and Associate Professor Jennifer Stephenson. Dr. Naomi Sweller assisted with statistical analysis of the result section.

4.   Petrina, N., Carter, M., & Stephenson, J. (2015). Parental perception of the importance of friendship and other outcome priorities in children with autism spectrum disorder. *European Journal of Special Needs Education, 30*, 61-74.

I conducted the study and wrote this paper with advice and input from Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

5.   Petrina, N., Carter, M., & Stephenson, J. (in press). Teacher perception of the importance of friendship and other outcome priorities in children with autism spectrum disorder. *Education and Training in Autism and Developmental Disabilities*

I conducted the study and wrote this paper with advice and input from Associate Professor Mark Carter and Associate Professor Jennifer Stephenson.

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CHAPTER 1: INTRODUCTION

This thesis provides an examination of several different aspects of friendship in children with autism spectrum disorders (ASD) including the characteristics of friendship, perceptions of friendship quality, friendship satisfaction, and parent and teacher perceptions of the importance of friendships. This chapter provides background to the area of study, addresses conceptual and theoretical issues, and provides an overview of the thesis. In addition, the research questions are presented.

Background to the Research

Definition and Behavioral Manifestations of Friendship

Friendship is a specific dyadic relationship characterized by interactions that are voluntary and reciprocal in nature, while 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; Gilfford-Smith & Brownell, 2003; Howes, 1983; Webster & Carter, 2007). Decades of research on close personal relationships have suggested that the interactions that occur in peer relationships differ qualitatively compared to interactions occurring with family members (Fabes, Gaertner, & Popp, 2006). Nonetheless, both types of relationship have been shown to play an important role in children's social, cognitive and emotional development (Crosnoe, 2000; Parke et al., 2004).

Peer relationships exist along a continuum of intimacy, from acquaintances to casual friendship, to close friendship (Evans & Meyer, 2001; Matson, Matson, & Rivet, 2007; Meyer et al., 1998). Across the life span, friendship manifestations, functions, interactional processes and outcomes evolve in accordance with the developmental progression of a person's physical, social, cognitive and emotional aspects (Lang & Fingerman, 2004). These personal dispositions together with situational contexts have

been hypothesized to be important in shaping the properties of the child's close peer relationships (Hartup & Laursen, 1993).

Researchers have recently documented gender differences in friendship experiences of children with ASD (Sedgewick, Hill, Yates, Pickering, & Pellicano, 2016). Gender differences were reported across disability status of friends (Dean et al., 2014), level of social motivation (Head, McGillivray, & Stokes, 2014), type of interest and pattern of imaginative play (Knickmeyer, Wheelwright, & Baron-Cohen, 2008).

The Importance of Friendship in Child Development

The components of friendship and its functions continually evolve across the lifespan and are distinct within different age groups (Gilfford-Smith & Brownell, 2003). For example, younger children define their friendships mostly in terms of companionship, whereas older children often emphasise the importance of self-disclosure, loyalty, and intimacy in their friendships (Rose & Asher, 2000). In typically developing children, friendship promotes positive social, cognitive, and emotional development, all of which are influential in the overall sense of wellbeing (Hartup & Stevens, 1999). High quality friendships have been associated with 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). In addition, Newcomb and Bagwell (1995) reported that children who have friends were more sociable, cooperative, altruistic, were more self confident and reported a lower degree of loneliness.

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 crucial for successful future social relations (Hartup & Laursen, 1993; Newcomb & Bagwell, 1995).

Theoretical Perspectives on Friendship Study

A number of theoretical perspectives inform the conceptual framework for the research reported in this thesis. Specifically, these relate to the functions of friendship (Sullivan, 1953), conception of friendship (Selman, 1980), friendship adjustments (friendship quality and satisfaction), and friendship reciprocity. Each will be briefly considered.

Sullivan (1953) proposed a conceptual framework for the development and functions of friendship. He introduced the idea of the emergence of specific social needs across five developmental stages that can be fulfilled by certain key relationships (Buhrmester & Furman, 1986). Two of these stages are particularly relevant to the research presented in this thesis. The emergence of the desire for peer companionship starts to arise during the *juvenile era* (6 to 9 years) stage, which promotes the development of friendship. In addition to companionship, friendship within this stage also acts to fulfill the need to promote a sense of self-worth and peer acceptance. It is only during the *pre-adolescence stage* (9 to 12 years) that the need for intimate exchange arises. It is within this context that the mastery of certain social competencies (e.g., perspective taking, empathy, self-disclosure, altruistic concern) is built, setting the base for future romantic and parental relationships. Furthermore, he suggested that children across different developmental stages differ in the way they define friendship. Initially children define friendship primarily on the basis of activities and perceive their

friends in terms of rewards and costs. During early school year and adolescence, their perception of friendship then develops to include areas of mutual liking, closeness, and loyalty.

The analysis of friendship at the level of the individual (e.g., how individuals define and characterize friendship, the thoughts they have about friendship, and the meaning that they give to friendship), and the influence of their friendship conceptions on their actual friendship relations, is crucial in understanding how one assesses the quality of his/her friendship relations. Selman (1980) explored how perspective-taking abilities may affect development and changes in friendship conception. Based on a cognitive-developmental approach, he suggested five stages of social perspectives across developmental age groups from children as young as three years old (the ego-centric point of view) up to adulthood (in-depth perspective taking). This development begins when a friend is considered as simply a 'playmate' (stage 0); then when they consider one another as a source for primary gratification (stage 1); then when they see their involvement in the reciprocal relation (stage 2); followed by the realization of the reciprocal nature of the relationship (stage 3); and finally the conception of the dependence on one another in the relationship (stage 4). This theory was further investigated by Furman and Bierman (1984), who provided empirical evidence that friendship expectation increases in complexity cumulatively over the course of development. Further, they showed that children conceptually differentiate behavioral characteristics of friendship relations as compared to acquaintances.

The majority of early researchers of friendship have focused on understanding the nature and effect of peer acceptance and rejection. It was not until the 1980s that researchers started to make clearer conceptual distinctions between children's group acceptance and children's experience in their friendship dyadic relations, such as

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friendship quality and satisfaction (Asher, Parker, & Walker, 1996; Bukowski & Hoza, 1989). As a result, a number of researchers have developed instruments to systematically assess individual differences in the quality of children's friendships. Bukowski, Hoza, and Boivin (1994) developed the Friendship Quality Scale (FQS), and Parker and Asher (1993) adapted the FQS to create their Friendship Quality Questionnaire (FQQ). Both the FQS and the FQQ measure several characteristics that are central to friendship relations as recognized within the theoretical and empirical literatures of previous friendship studies. These characteristics include dimensions of companionship, conflict, help and guidance, security, closeness, intimate exchange, and validation and caring.

Previous researchers have agreed that reciprocity is inherent to friendships. In research, friendship reciprocity has mainly been conceptualised in terms of the existence of friendship and the level of friendship status. Specifically, this has involved examination of whether partners within dyads nominate each other as friends as well as the degree of intimacy (e.g., regular friend, best friend, etc.,) (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). The present thesis expands the address of friendship reciprocity by providing data on the similarity of perception across area of friendship quality and satisfaction between dyad partners in the same relationship.

Friendship in Children with Autism Spectrum Disorders

Features of ASD relevant to friendship development. The diagnosis of ASD indicates persistent deficits in the area of social interaction and communication, coupled with the presence of restricted, repetitive patterns of behavior, interests, or activities. Specifically, this includes deficiency in social-emotional reciprocity, in the use of non-verbal communicative behaviors for social interactions, and in developing and

maintaining relationships appropriate to the child's developmental level (American Psychiatric Association, 2013; Fuentes et al., 2012).

These specific impairments related to the ASD diagnosis might affect their ability to develop and maintain friendship relations, and might differentiate the characteristics of their friendships from those of typically developing children or children with other disabilities. Heterogeneity in the ASD diagnosis further complicates the study of friendships as there is a high degree of individual variation within the cognitive, linguistic and social profiles of children with ASD (Landa & Goldberg, 2005) that might impact on their ability to develop and maintain friendship relations. In addition, individuals with ASD may have low social motivation that might impact on their friendship development (Calder, Hill, & Pellicano, 2013; Chevallier, Kohls, Troiani, Brodkin, & Schultz, 2012).

Social-emotional reciprocity includes the skills required for a child to be able to provide an appropriate emotional response to another person in a social situation. In children with ASD, social-emotional reciprocity issues have been documented in the areas of initiating social interaction (Hauck, Fein, Waterhouse, & Feinstein, 1995), orienting to social stimulus (Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998), joint attention (Naber et al., 2007), social imitation (Rogers, 1999), the use of language for social interaction (Volden, Coolican, Garon, White, & Bryson, 2008; Young, Diehl, Morris, Hyman, & Bennetto, 2005), and theory of mind (Fuentes et al., 2012; Travis & Sigman, 1998). All of these abilities form the foundation for the processing of social information, which guides the individual's use of social strategies in an interaction (Diamond, Huang, & Steed, 2010). Impairment within any of these skills might impact on the level of competencies in one's ability to choose a social strategy, which might directly impact on development and maintenance of friendship within this population.

Previous researchers have investigated specific areas of deficit and their influence on social competencies. For example, deficits in theory of mind can be seen in individuals with ASD: that is, deficits in the ability for an individual to have an understanding of the mental states of others and hence, to some extent, predict their actions (Baron-Cohen, 1989; Baron-Cohen, Leslie, & Frith, 1985; Baron-Cohen, Tager-Flusberg, & Cohen, 1993). Theory of mind is also closely related to the ability to understand deception and the emotions of other people. Studies have shown that deficits in theory of mind negatively affect empathy, sharing, social and emotional reciprocity, and peer relationships (Fombonne, Siddons, Archard, Frith, & Happé, 1994; Frith, Happé, & Siddons, 1994; Fuentes et al., 2012; Hughes, Soares-Boucaud, Hochmann, & Frith, 1997; Travis & Sigman, 1998). Thus, it seems probable that deficits in theory of mind may affect the development and maintenance of friendship relationships.

Difficulty in non-verbal communication for children with ASD is often manifested in their impairment in gaze shift (Jones & Klin, 2013; Krstovska-Guerrero & Jones, 2016); ability to manage normal volume, pitch, intonation, and rhythm of their speech; capacity to recognize and interpret other's non-verbal expressions, such as facial expression; and in their lack of ability to express and understand affect (Harms, Martin, & Wallace, 2010; Uljarevic & Hamilton, 2013). Significant difficulties in non-verbal communication have been shown to influence the level of social competency in general (Denham, Salisch, Olthof, Kochanoff, & Caverly, 2010) and the quality of interaction and impact on the development and evolution of friendship specifically. Furthermore, the stereotyped, restricted and repetitive patterns of activities, behaviours, and interests, commonly found in children with ASD may be stumbling blocks in establishing and maintaining friendships (Hobson, 1993; Kasari & Bauminger, 1998).

Observational studies have also described behavior that may exacerbate the failure in friendship formation of children with ASD. Bauminger, Shulman, and Agam (2003) reported that children with ASD in their sample showed less initiating and responding to social interaction initiated by others during unstructured recess time within mainstream settings. As compared to typically developing children, children with ASD showed less sharing and less social conversation (Bauminger et al., 2008).

Thus, there appears to be a number of social-cognitive characteristics and related behavioral manifestations associated with ASD that have the potential to impact on the development of friendship perception. Research relevant to the thesis, addressing friendship development and perception in children with ASD, will now be presented.

Previous research on friendship. In this section a brief overview of some key areas of research will be presented. More detailed consideration of the relevant research will be presented later in the thesis.

Investigation of friendship in children with ASD has received considerable interest in the last decade. The differences in patterns of social relationships, including friendship, between typical children or children with other disabilities and those with ASD have been investigated in a number of studies. Previous researchers have explored various areas of friendship, namely characteristics of friends (e.g., Bauminger et al., 2008; Kuo, Orsmond, Cohn, & Coster, 2013); behavioral manifestations of friendship relations (e.g., Bauminger & Shulman, 2003, Kuo et al., 2013); individual's position within a social network (e.g., Chamberlain et al., 2007; Kasari et al., 2011); and the deeper structure of friendship, specifically friendship quality and friendship satisfaction (e.g., Bauminger et al., 2008; Carrington, Templeton, & Papinczak, 2003; Calder, Hill, & Pellicano, 2013). Other researchers have also examined loneliness (e.g., Bauminger & Kasari, 2000; Locke, Ishijima, Kasari, & London, 2010; Whitehouse, Durkin, Jaquet,

& Ziatas, 2009), peer rejection and acceptance (e.g., Rotheram-Fuller et al., 2010), and experiences of bullying (e.g., Rowley et al., 2012). The perspectives of how children with ASD perceive and define their friendship relations have also been examined (e.g., Bauminger & Kasari, 2000; Daniel & Billingsley, 2010). Given the scope and quantity of research produced and the absence of studies systematically reviewing the nature of friendship specifically in children with ASD, it would seem timely to provide a systematic review of our current knowledge.

There have been numerous studies conducted to investigate the level of friendship quality in children with ASD as compared to typically developing peers (e.g., Bauminger & Kasari, 2000; Kasari et al., 2011; Locke et al., 2010; Solomon, Buaminger, & Rogers, 2011). Overall, children and adolescents with ASD tend to report significantly lower level of friendship quality as compared to typically developing peers.

In typically developing children, comparisons of friendship quality perception between dyad members have been made and analysed either by examining correlations (e.g., Parker & Asher, 1993; Lecce, Pagnin, & Pinto, 2009) or by the absolute differences in friendship quality scores (e.g., Cleary et al. 2002). Corresponding research in children with ASD to examine the perception of friendship quality from both members of the friendship dyad does not appear to have been conducted. Children with ASD may differ in their understanding of the nature of friendships, thus examining perceptions of friendship quality from both parties in a relationship may provide a deeper understanding of possible mismatches that may affect relationship quality and satisfaction.

Although there is evidence that the relationships and friendships of children with ASD may differ from those of typically developing children (Bauminger &

Shulman, 2003; Bauminger, Shulman, & Agam, 2004; Chamberlain et al., 2007; Locke et al., 2010; Whitehouse et al., 2009) there are relatively few data on the impact of these differences on satisfaction with relationships. Calder et al., (2013) conducted the only known study of friendship satisfaction in children with ASD. They reported that children with ASD were generally satisfied with their current friendships, even though their measured level of friendship quality was lower compared to their typically developing classmates. No satisfaction data from friends were collected, however, and such information may be of importance to the long-term maintenance of relationships. This represents a clearly underexplored area of research.

In more recent years, studies have emerged focusing on interventions to develop friendship and related skills, which include parents and teachers as intervention agents (Matson et al., 2007, McConnell, 2002). Previous researchers have looked at parent perceptions of the importance of different curriculum areas for children with moderate to severe intellectual disabilities (Epps & Myers, 1989; Hamre-Nietupski, 1993; Hamre-Nietupski, Nietupski, & Strathe, 1992; Westling, 1997) and, although a number of studies of friendship in children with ASD have included parents as participants (Bauminger & Shulman, 2003; Bauminger et al., 2008), they have not examined the issue of parental perception of the importance of friendships in relation to other educational priorities. Parental perceptions may give us additional insights into the nature of social relationships of children with ASD, considering the active role that parents may play in facilitating friendship (Haring, Lovett, & Saren, 1991).

Teachers also play an important part in assisting children's friendship development within the school environment. Mavropoulou and Padeliadu (2000) provided the only study located that investigated how teachers perceived different curriculum priorities for children with ASD. They reported that special education

teachers who have received specific training in ASD were better able to match curriculum priorities specific to student needs, as compared to mainstream class teachers, who tended to focus on broader areas of well-being. Nevertheless, they did not specifically examine the priority given to the development of friendship.

A close collaboration between teachers and parents would arguably be an important consideration if friendship related skills are to be maintained and generalised successfully across multiple settings. Jepsen, Gray, and Taffe (2012) suggested that perceptions of teachers may differ from parent perceptions in regards to student behavioral problems and social functioning, and differences of this type may impact on how friendship development is prioritised. There does not appear to be any research examining correspondence between teacher and parent curriculum priorities for children with ASD that includes consideration of friendship development. This is an important area to be examined, considering that there is evidence of discrepancy between teacher and parent priorities of learning outcomes in typically developing children (Knudsen-Lindauer & Harris, 1989).

Aims of the Research

The aim of this research is to investigate friendship in children with ASD through the perspectives of those children with ASD, their nominated friends (dyad partners), parents and teachers. Data were collected to answer the following questions:

1. What is the current status of research on the nature of friendships in children with ASD?

2. What is the level of reported friendship quality in children with ASD and their nominated friends (with and without diagnosis of ASD) as measured using the Friendship Quality Questionnaire? How similar are these perceptions between

children with ASD and their nominated friends within the same dyadic relations?

3.	What is the reported level of friendship satisfaction of children with ASD and their nominated friends? How similar are the perceptions between dyad members within same relationship?

4.	How do parents and teachers view the importance of friendship development as compared to other outcome priorities?

Epistemology of the Current Research

The current research is designed to investigate the complex phenomenon of friendship in children with ASD. Through the process of systematic review of past literature, an understanding of friendship in children with ASD was developed, which provided the basis for the current analysis. Friendship often involves multidimensional levels of behavior and affective manifestations, which take place both in public and private settings (Berscheid & Regan, 2005). Thus, a primarily quantitative approach was adopted, combined with some qualitative exploration in the analysis of friendship. Data on friendship were collected from multiple sources and perspectives using combined methods of self-report, peer report, and parent and teacher report. The main focus of the present study was to investigate children's close dyadic relationships (their participation in friendship) rather than the level of peer acceptance (popular, accepted, rejected, etc.). The concept of friendship was considered in relation to a discrete set of ideas: specifically, behavior that reflects friendship, cognitive conception of friendship, quality of friendship, satisfaction with friendship, and the importance of friendship development as viewed by other stakeholders (teachers and parents).

Structure of the Thesis

The current thesis consists of individual manuscripts formatted in journal article style. An introductory and a concluding chapter are provided along with linking paragraphs. The publication status for each manuscript is presented at the beginning of the relevant chapter.

Chapter Outline

Chapter 2. In the second chapter, a systematic review of existing research addressing the characteristics of friendship in school-age children with a diagnosis of ASD is presented. The findings from the review (Petrina, Carter, & Stephenson, 2014) indicated consistent evidence for several topographical and qualitative differences in friendship characteristics across children with ASD as compared to typically developing children.

As a result of this review, several suggestions and areas for future research were identified. These areas were the need for: a) broader sampling of participants (age, autistic symptom severity, and degree of intellectual impairment); b) more investigation utilizing objective data collection; c) increased longitudinal study of friendship development; d) more consideration of the use of operational definitions of friendship and attempts to triangulate friendship nominations among multiple sources; and e) more comparative studies between friendship perception of children with ASD and their nominated friends.

Chapter 3. Chapter 3 presents a research study (Petrina, Carter, Stephenson, & Sweller, 2016) examining the level of friendship reciprocation and similarity in perception of friendship quality across the disability status of the peers in friendship dyads. The term non-mixed dyad was used for friendships where both children have a disability, and mixed dyad was used for friendships between children with a disability and typically developing peers. This represented the first study of this nature to be

conducted. The majority of the friendships were reciprocated, and no differences were observed between mixed and non-mixed dyads. Analysis at the dyadic level indicated that the children with ASD differed in perceptions of their friendship quality as compared to their nominated friends.

Chapter 4. Chapter 4 includes a study (in press) examining the issue of friendship satisfaction in children with ASD and their friends. Differences in friendship characteristics for children with ASD compared to typically developing children have been reported. These differences, however, need to be interpreted in relation to the expectations and degree of satisfaction of the children in the relationship. Consequently, a quantitative study examining the friendship satisfaction of children with ASD and their friends, in friendships both with typically developing peers and with other children with ASD, was undertaken.

There were no significant differences observed in the level of satisfaction between children with ASD and their friends (either typically developing children or those with ASD). Both groups reported relatively high level of satisfaction in their 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 and their friends.

Chapter 5. The fifth chapter presents two related studies that provide an examination of the extent to which friendships are prioritised by parents (Petrina, Carter, & Stephenson, 2015) and teachers (Petrina, Carter, & Stephenson, in press) in relation to other curriculum areas. Collaboration between parents and teachers is considered important to the planning of effective education programs for children with ASD. Thus, it was of interest to determine the extent to which friendship is prioritised and the degree of agreement between parents and teachers.

Parents and teachers were asked to rate and rank the importance of friendship as compared to other curriculum outcomes (e.g., intellectual and academic skills; social skills; physical skills and motor development; creativity; and emotional skills). Parents consistently rated all curriculum outcomes as more important in their children's development than did teachers. When forced to rank, friendship was ranked similarly on average across parents and teachers. Nevertheless, on an individual level, the lowest level of absolute agreement between teachers and parents ranking was in the area of friendship. Teachers ranked friendship skills to be of higher importance as compared to other outcome priorities than parents.

Chapter 6. In this chapter a summary of the present research is presented, highlighting the contribution made to the field. Furthermore, the limitations of the present studies and direction for the future research are summarised

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CHAPTER 2: THE NATURE OF FRIENDSHIP IN CHILDREN WITH AUTISM SPECTRUM DISORDERS: A SYSTEMATIC REVIEW

Chapter Overview

This chapter provides a systematic review of the current literature on friendship in children with autism spectrum disorder published in Research in Autism Spectrum Disorders (Petrina, Carter, & Stephenson, 2014). The result of the review indicates several topographical and qualitative differences in friendship characteristics across children with ASD as compared to typically developing children. As a result of this review, a number of gaps in the current knowledge were identified and several suggestions and areas for future research were made.

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

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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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Contents

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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 (Gilfford-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, & Pohlig, 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

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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; Viecili, 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 occured 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
Comparative quantitative studies											
Bauminger and Kasari (2000)	Friendship Qualities Scale Loneliness Rating Scale Parental reports	✔		✔	Schools, tertiary education clinic, community	Meeting the criteria for autistic disorder as described in DSM-IV	✔		✔		✔
Bauminger and Shulman (2003)	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	✔		✔	✔	

Study	Measures				Setting	Inclusion criteria					
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)	✔		✔	✔	✔
Non comparative quantitative											
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
Qualitative											
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, Buaminger, & 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 questionnaries. 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 statisfaction 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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CHAPTER 3: PERCEIVED FRIENDSHIP QUALITY IN CHILDREN WITH AUTISM SPECTRUM DISORDER AS COMPARED TO THEIR PEERS IN MIXED AND NON-MIXED DYADS

Chapter Overview

This chapter includes a paper published in the *Journal of Autism and Developmental Disorders* (Petrina, Carter, Stephenson, & Sweller, 2016). Limited research on reciprocation of friendship was identified in the literature review (Chapter 2). In Chapter 3, friendship reciprocation and similarity in perception of friendship quality across the disability status of the peers in friendship dyads are examined. Friendship reciprocity was categorized according to the differing level of intimacy, namely best friendship (voluntarily or confirmed), regular friendship (voluntarily or confirmed), or non-friendship. It was found that the majority of the friendships were reciprocated, and no differences were observed between mixed and non-mixed dyads. Dyadic analysis of friendship quality shows a difference in perceptions between the target children with ASD and their nominated friends. This study is the first one conducted that specifically investigated the level of similarity of friendship quality in children with ASD and their friends.

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Perceived Friendship Quality of Children with Autism Spectrum Disorder as Compared to their Peers in Mixed and Non-mixed Dyads

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Abstract There has been limited research exploring the similarity of perception of friendship quality between children with Autism Spectrum Disorder (ASD) and their friends. In this study, 45 children with ASD participated together with their friends. Two levels of friendship quality congruency were investigated: reciprocity and mutuality. A high proportion of the friendships were reciprocated for both the mixed and non-mixed friendship groups. Nevertheless, students with ASD reported substantial differences in perceptions of their friendship quality as compared to their nominated friends. The findings of the present study mirrored those of previous research with typically developing children. Further study is required to systematically investigate the differences in friendship quality perceptions within friendship dyads for both typically developing children and those with ASD diagnosis.

Keywords Friendship quality · Autism spectrum disorder · Mutuality · Congruency · Friendship reciprocity

Introduction

Friendship in typical children has been shown to be influential in their sense of well-being (Hartup and Stevens 1999). Friendship is a type of dyadic interpersonal relationship involving voluntary social exchanges characterized by a degree of reciprocity and mutuality (Bukowski et al. 1996). Children with autism spectrum disorder (ASD)

experience impairments in the building blocks of friendship, namely social and communication skills (Fuentes et al. 2012; Hill and Frith 2003; Sigman and Ruskin 1999; Travis and Sigman 1998). Various researchers have shown atypical characteristics of friendship in children with ASD, such as fewer observed friendship relations (Bauminger and Shulman 2003; Rowley et al. 2012), and lower perceived quality in friendships involving children with ASD as compared to those only involving typically developing peers (for review, see Petrina et al. 2014).

It has also been observed that compared to typically-developing children, participants with ASD often reported having more friends with a disability (Bauminger and Kasari 2000; Bauminger and Shulman 2003; Bauminger et al. 2008b; Locke et al. 2010). The disability status of the friends has been reported to affect the characteristics of friendship. For example, compared to non-mixed friendships (where both children have a disability), mixed friendships (between children with a disability and typically developing peers) were often characterized by less parallel play and more coordinated play; higher reported friendship qualities in the area of positive social orientation and fun and closeness; and lower levels of reported conflict (Bauminger et al. 2008a).

Although there has been substantial research comparing friendships involving children with ASD with relationships involving only typically-developing children (e.g., Kasari et al. 2011; Calder et al. 2013), more limited attention has been given to examining the perspectives of both members of a friendship dyad involving a child with ASD. The reciprocal nature of friendship necessitates that the viewpoints of both dyad members be taken into consideration in order to gain a full understanding of the friendship quality. The analysis of congruency in friendship perception is important since an individual's perception of his/her

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friendship quality often impacts on both their own behavior towards their partner and also their evaluations of their friend's behavior (Furman 1996). Hence, it is possible a marked discrepancy in perceptions may place a relationship at higher risk of breakdown. Furthermore, a lack of congruence may also indicate differing perceptions of children with ASD as to the nature of their relationship. The similarity of friendship perceptions between dyad members has been termed the level of congruency (Cleary et al. 2002), and it can be measured in a number of ways. One approach is by measuring the level of reciprocity. Reciprocity signifies that both members of the relationship acknowledge the existence of the friendship, which entails an understanding of its norms and expectations. An alternative strategy is to compare the degree of friendship mutuality, which refers to the deeper dimensions shared within the friendship, such as affection, task oriented and communicative behavior, and social responsivity (Newcomb and Brady 1982; Piehler and Dishion 2007).

Friendship reciprocation has been explored in a number of previous studies with both typical children and children with ASD (Chamberlain et al. 2007; Kasari et al. 2011; Rotheram-Fuller et al. 2010). Reciprocation has often been measured by calculating the percentage of dyad members nominating each other as either best friends or within their top three friendships. A number of researchers have shown that children and adolescents with ASD had a consistently lower level of reciprocity across nominations of their top three friends and best friends as compared to typically developing matched peers (Chamberlain et al. 2007; Kasari et al. 2011; Rotheram-Fuller et al. 2010). These results suggest that at a gross level, children with ASD may often perceive friendship relations differently to those they nominate as friends. Overall, these studies have provided information on reciprocity with regard to the existence of the friendship but do not provide in-depth investigation of the nominated friends' viewpoints of the friendship quality.

Friendship mutuality can be explored through the use of measures of friendship quality, such as the Friendship Quality Questionnaire (FQQ; Parker and Asher 1993). One approach might be to compare the ratings on the various dimensions of friendship reported by both members of a dyad. As such an approach examines central tendency of the total sample, it is possible that substantial differences within dyads in different directions may cancel out in the analysis, obscuring possible differences in perception. Another approach to investigate discrepancies in friendship quality is to examine the correlations between the scores of friendship quality perceptions of members of a dyad (e.g., Parker and Asher 1993; Lecce et al. 2009). Parker and Asher (1993) reported, for typically developing children, varying degrees of correlation, ranging from moderately correlated perceptions for companionship and recreation

($r = 0.64$) to much lower correlations for conflict resolution ($r = 0.21$). This approach demonstrated correlation of perceptions of friendship quality across subscales, but it may not necessarily reflect the actual magnitude of the differences in friendship perception. For example, it is possible that high levels of correlation might exist when there are consistent differences between the scores of a particular friendship quality dimension of child with ASD and a peer (e.g., the child with ASD consistently rates dimensions more highly).

A better approach to capturing congruency is to examine the absolute differences in scores between the members of the dyads. This approach allows researchers to investigate the magnitude of differences between friends across various dimensions of friendship quality perceptions. Cleary et al. (2002) adopted this approach and found that level of congruency in typically developing children varied across gender and friendship status. More similarity of perception was found in girls' friendships than in boys'. Furthermore, best friends were found to be more similar in their perception of friendship quality than friends.

No previous study has provided an investigation using the absolute difference of friendship quality perceptions by both children in a dyad as a measure when exploring friendships in children with ASD. Given the previously discussed differences in understanding of the nature of friendships by children with ASD, gaining such information may provide a deeper understanding of congruency and possible mismatches that may affect relationship quality and satisfaction, from the perspective of both parties. Hence, the aim of this paper is to address the following two questions. First, what is the level of reciprocation reported across friendship dyads in children with ASD and does it vary across the disability status of the peers in the dyad? Second, what level of mutuality is present across dimensions of friendship quality and how does this vary across the disability status of the peers in the dyad?

Method

The data used in this paper were obtained from a larger multiyear study ("Autism Educational Outcomes Study") investigating two models for education service delivery for students with ASD in Australia. The models include an option for educational placement within either a mainstream class or a satellite class model. In New South Wales (NSW), students in the satellite model were placed in a special class within a regular school prior to a gradual transition into mainstream classrooms. In the consultative support model in South Australia (SA), children were supported in mainstream classes from the point of school

entry. Only data regarding friendship quality will be addressed in this study.

Participants

Following ethics approval and school consents, written consent for participation was obtained from parents of eligible participants, and also the parents of their peers. Eligible participants fulfilled the inclusion criteria of: (a) current enrollment in Kindergarten (Reception) to Year 3 at the start of the project; (b) a formal diagnosis of Asperger's disorder or autistic disorder by a pediatrician or psychologist using DSM-IV diagnostic criteria; and (c) intellectual functioning within normal limits or within the mild range of intellectual disability according to a formal diagnostic assessment. Altogether, 90 children took part in this study. The students with ASD included 37 boys and eight girls, between the ages of 6.4 and 10.4 years old (Mean = 8.5, SD = 0.9). The mean full scale IQ of the participants was 81.7 (SD = 15.4). The total mean score for the Social Responsiveness Scale (SRS, Constantino and Gruber 2005) is reflective of participants with a clinical diagnosis of autism spectrum disorder, who often experience significant difficulties in the area of social functioning. Demographic data for the nominated friends were not collected. A summary of the children's characteristics is presented in Table 1.

The overall ASD group (n = 45) was divided into two groups according to whether their friend was a child with a diagnosis of ASD (non-mixed friendship) or whether the friend was a typically developing child (mixed friendship). Forty-nine percent (n = 22) of the ASD group were in a non-mixed friendship dyad and 51 % (n = 23) were in a mixed friendship dyad. The majority of the mixed dyad

Table 1 Demographic characteristics of children with ASD

Children	Mean (SD)	
	Mixed dyad	Non-mixed dyad
Age	8.47 (0.91)	8.42 (1.15)
Full scale IQ*	88.67 (14.92)	77.15 (14.03)
Missing data	2	2
Verbal IQ	85.41 (16.53)	82.41 (18.07)
Missing data	–	1
SRS scores		
Total*	83.70 (13.68)	75.55 (11.65)
Social awareness	72.30 (12.63)	69.05 (11.12)
Social cognition*	83.22 (12.89)	73.14 (12.47)
Social communication	80.43 (12.03)	72.05 (11.98)
Social motivations	69.70 (12.48)	64.41 (13.80)
Autistic mannerism	83.70 (13.68)	80.45 (14.58)

* $p < 0.05$

samples were participants from SA (n = 18 out of 23) where students were placed within a regular class, whereas the majority of the non-mixed dyad samples came from NSW (n = 21 out of 22) where most participants were placed in a special satellite class within a mainstream school. In SA all children were in regular classroom placements. In NSW, eight students were in regular classroom placement and 18 were in satellite placement.

Friend Selection

The process of identifying possible friends of children with ASD was completed through a number of steps. Initially, classroom teachers asked the children with ASD to nominate three friends. Consent forms were then sent to the parents of the nominated friends. If the target child could not identify three friends, invitation letters were sent to peers with whom the child with ASD interacted the most. Parents of friends returned consent forms to the researchers using enclosed reply paid envelopes. For operational reasons, the typical delay between return of the consent form and the administration of the FQQ ranged from two to eight weeks. The child for whom parental consent was received was interviewed as the target child's nominated friend on the day of data collection. If multiple consents were returned, the child with ASD was asked to confirm which friend was a better friend on the day of the interview, and this friend was then interviewed.

Measures

Instrument

The level of perceived friendship quality was assessed using the FQQ (Parker and Asher 1993), which is composed of 40 primary items with the addition of one warm up item and four repeat items (as a measure of reliability). The FQQ was designed to measure six underlying features of friendship quality: companionship and recreation, conflict resolution, conflict and betrayal, help and guidance, intimate exchange, and validation and caring. Instead of using the original 5-point response scale, participants were asked to respond to the FQQ items using a simplified 3-point response scale (i.e., 1 = never, 2 = sometimes, 3 = always) with visual supports. The 3-point response scale for FQQ was used successfully by Webster and Carter (2010) to investigate friendship in young children with developmental disabilities. This procedural change has allowed children as young as five years old with limited language and communication skills to contribute information on their friendships successfully. This modification was adopted in the present study given the age range of the participants.

Procedure

Trained research assistants (RAs) administered the FQQ individually to participants at their school during the interview. The RAs were trained to administer the FQQ in a one and a half hour training session that included an explanation of the FQQ and practice administration using role-play. During the interview, each question was read aloud and all participants were given a cue card containing pictorial symbols for the 3-point scale to assist them in selecting the appropriate answers (different colored facial expression symbols representing never, sometimes, and always). If a "yes" was given as a response, the RA would clarify the answer by saying "Is that some of the time or all of the time?" or a similar phrase, to elicit a sometimes/always responses. All "no" responses were considered to be "Never". All participants with a known diagnosis of ASD completed the FQQ for only one friend at a time. However, nominated friends with no known diagnosis of ASD completed the FQQ for two friendships simultaneously (i.e., a friendship with the ASD child and one of the names the child nominated as a friend, which served as a distractor). The data collected for the distractor friendship were discarded. Given that typically developing peers may not have been aware that their friend had ASD, this was considered an appropriate strategy to avoid drawing unwarranted attention to children with ASD.

Friendships were classified as best friendship, regular friendship, or non-friendship. At the start of the interview, both the child with ASD and his/her friend were asked to list the names of their regular friends and one best friend. A *voluntary regular friend* reciprocation existed when (a) both members of the dyad listed each other as a regular friend, or (b) when one listed the other as a best friend and the second person identified the relationship as a regular friendship. If both members of the dyad nominated each other as best friends, this was considered to be a *voluntary best friend* reciprocation. If the ASD child failed to mention the name of a previously nominated friend for whom consent had been received, the research assistant would read out the name of the consented peer and ask if this person was a friend or not. If the participating child confirmed the friendship, this was considered to be a *confirmed regular* friendship. If one of the dyad failed to confirm the friendship, it was considered to be *unreciprocated friendship*. When both parties did not confirm the friendship, it was called *non-friendship*.

Reliability

Four repeat questions were added as a reliability measure (i.e., items 2, 7, 11, and 26). For the target children, 76.6 % of the repeat items were complete agreement, 20.7 % were 1-point difference, and 2.7 % were 2-point differences. For peers, 77.7 % of the repeat items were complete agreement, 21.3 % were 1-point difference, and 1.1 % was 2-point differences. The averaged spearman rank correlation across questions and groups was 0.72. No children scored 2-point differences in more than one of the repeat items.

All the data were entered into a spreadsheet by the first author. The double entry method was then applied to ten percent of the data entered to assess the accuracy of data entry. This method of entering data has been shown to be the most accurate method as compared to both the single entry and single entry with visual checking methods of data entry (Scott et al. 2008). No error of data entry was found in this study.

Results

Reciprocation Status

A summary of reciprocation status is provided in Table 2. Overall, 42 out of 47 friendships were reciprocated. A higher reciprocation rate was observed for voluntary regular friendship (55 %, n = 26 out of 47) as compared to voluntary best friendship (19 %, n = 9 out of 47) and confirmed regular friendships (15 %, n = 7 out of 47). The reciprocation rate of voluntary best friendship was lower in the mixed dyads as compared to the non-mixed dyads (15 and 24 % respectively). A similar pattern was observed in the rate of reciprocated regular friendships across mixed and non-mixed dyads (54 and 62 % respectively). Furthermore, 6 out of 26 of the regular friendships in the mixed dyads were confirmed, compared with only 1 out of 26 in the non-mixed dyads. There were two dyads in the mixed group in which neither the children with ASD nor their peers confirmed their friendships during the interview and these data were excluded further from the analysis.

Fisher's Exact Tests were used to examine whether peer reciprocations differed between mixed and non-mixed dyads for volunteered best friend and volunteered regular friend nominations by children with ASD. Neither test was significant (both $p > .05$), indicating peer reciprocations did not differ between mixed and non-mixed dyads for either volunteered best friend or volunteered regular friend nominations by children with ASD. Analyses on confirmed regular friend and non-confirmed nominations by children with ASD could not be completed due to the large number of empty cells for both of these analyses.

Table 2 Friendship reciprocation across mixed and non-mixed dyads

	ASD			
	Volunteered best friend	Volunteered regular friend	Confirmed regular friend	Non-confirmed
Peers				
Volunteered best friend				
Mixed	4	2	1	–
Non-mixed	5	3	–	–
Volunteered regular friend				
Mixed	5	6	1	–
Non-mixed	8	2	–	–
Confirmed regular friend				
Mixed	1	2	1	–
Non-mixed	1	–	–	–
Non-confirmed				
Mixed	1	–	–	2
Non-mixed	1	1	–	–

'Volunteered best friend' = participant nominated his/her friend as a best friend; 'volunteered regular friend' = participant nominated his/her friend as a friend; 'confirmed regular friend' = participant did not state previously consented friends as a friend or best friend, and as a result, the research assistant asked the participant to confirm their friendship with a previously nominated peer; and 'non-confirmed friend' = participant did not confirm a previously nominated peer as a friend following the question asked by the research assistant

Mutuality of Friendship Quality Perception

Prior to the examination of friendship quality congruency, it was of interest to examine the overall mean differences in the subscales between how children with ASD and their reciprocated friends perceived their mutual relationships. No significant difference was found between the two groups (see Table 3).

The level of mutuality of friendship perception was calculated from the absolute differences between the mean subscale scores for the dyads. A series of one-sample *t* tests against a score of zero were carried out to assess if congruence differed from zero. Scores not different to zero would indicate a high level of congruence (i.e. no difference in scores). Conversely, a significant difference from zero would indicate lower levels of congruence (i.e. differences between the two scores). Error rates were Bonferroni adjusted for multiple analyses. Congruence scores

on all measures were significantly different from 0 for the whole group as well as for mixed and non-mixed dyads separately (see Table 4).

A mixed design ANOVA was carried out to analyze the effects of dyad status (mixed or non-mixed, between subjects) and subscale (within subjects) on the congruence of ratings. There was no main effect of dyad status [$F_{(1, 43)} = 1.45$, $p = .24$, partial $\eta^2 = .03$], indicating that averaged across subscales, there was no difference in ratings between mixed and non-mixed dyads (see Fig. 1). Averaged across dyad status, there was a main effect of subscale [Wilks' Lambda = .54, $F_{(5, 39)} = 6.75$, $p < .005$, partial $\eta^2 = .46$]. This main effect was followed up with pairwise comparisons between subscales, with error rates Bonferroni adjusted for multiple comparisons. Conflict resolution and intimate exchange both had higher congruence scores than conflict and betrayal [$F_{(1, 43)} = 19.93$, $p < .0005$, partial $\eta^2 = .32$ and $F_{(1,}$

**Table 3** *T* test results comparing the FQQ mean scores for the ASD group and the nominated friends group across all subscales

Subscales	Mean score ASD (SD)	Mean score friend (SD)	*t*	*df*	*p*
Validation and caring	2.23 (0.37)	2.19 (0.39)	0.51	44	0.61
Conflict resolution	1.71 (0.60)	1.87 (0.60)	−1.41	44	0.17
Conflict and betrayal	1.66 (0.25)	1.69 (0.25)	−0.58	44	0.56
Help and guidance	2.10 (0.43)	2.10 (0.44)	0.03	44	0.98
Companionship and recreation	2.05 (0.37)	2.00 (0.45)	0.77	44	0.45
Intimate exchange	1.80 (0.49)	1.72 (0.43)	0.83	44	0.41

Critical alpha for 6 comparisons is .008

Table 4 Congruence scores for each subscale for all dyads, for non-mixed dyads and for mixed dyads

Dyads	Subscale	Mean	SD	t value
All dyads	Validation and caring	0.41	0.26	10.52
	Conflict resolution	0.58	0.45	8.69
	Conflict and betrayal	0.27	0.23	7.93
	Help and guidance	0.42	0.32	8.66
	Companionship and recreation	0.33	0.26	8.51
	Intimate exchange	0.57	0.39	9.87
Non-mixed dyads	Validation and caring	0.46	0.26	8.33
	Conflict resolution	0.45	0.29	7.31
	Conflict and betrayal	0.30	0.25	5.59
	Help and guidance	0.43	0.33	6.16
	Companionship and recreation	0.29	0.17	7.95
	Intimate exchange	0.50	0.34	6.89
Mixed dyads	Validation and caring	0.36	0.26	6.68
	Conflict resolution	0.71	0.54	6.34
	Conflict and betrayal	0.24	0.21	5.60
	Help and guidance	0.41	0.33	5.96
	Companionship and recreation	0.37	0.33	5.49
	Intimate exchange	0.65	0.43	7.25

Critical alpha for 18 comparisons is .003. All comparisons are significant at $p < .003$
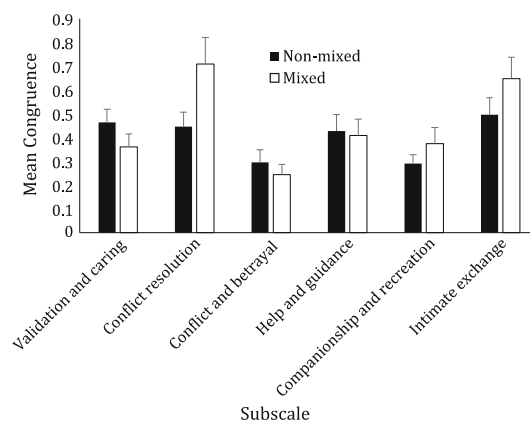
Fig. 1 Mean congruence scores by subscale and dyad status

43) = 20.32, $p < .0005$, partial $\eta^2 = .32$ respectively], and intimate exchange similarly had higher scores than companionship and recreation [$F(1, 43) = 12.35$, $p = .001$, partial $\eta^2 = .22$]. No other comparisons were significant after Bonferroni adjustment. Finally, there was no significant interaction between dyad status and subscale [Wilks' Lambda = .78, $F(5, 39) = 2.21$, $p = .073$, partial $\eta^2 = .22$].

Two further analyses was conducted, to compare our rate of mutuality to that of the previous study by Cleary et al. (2002) and to explore the relationship between SRS level and the degree of perceived friendship quality. First, T tests of the data from Cleary et al. suggested that the differences in the level of congruency reported across their friendship quality subscales were all statistically significant, a finding that mirrors our current study (see Table 5). To enable comparison between the studies, effect sizes were calculated in both studies by dividing the mean absolute difference for each subscale by the standard deviation for the relevant measure. As indicated in Table 5, large effect sizes were found in both Cleary et al. and the present study, indicating substantial differences between the ASD children and their reciprocal friends in their friendship quality perception. There was no obvious pattern of difference in the effect sizes in the present study and that of Cleary et al. Second, a correlation analysis was conducted for the SRS total score with each of the subscales of the FQQ. No significant relationships were observed (conflict resolution, $p = 0.70$; conflict betrayal, $p = 0.15$; help and guidance, $p = 0.13$; companionship and recreation, $p = 0.36$; intimate exchange, $p = 0.06$).

Discussion

No previous studies designed to specifically investigate the level of friendship congruency in children with ASD and their friends were found. Hence, the present study was designed to examine two distinct indicators of congruency in the perception of friendship in children with ASD: the

Table 5 Congruence scores for each subscale from the current study as compared to Cleary et al. (2002) study

Subscale	Our sample			Cleary's sample		
	Mean	SD	Effect size	Mean	SD	Effect size
Caring	0.41	0.26	1.58	1.09	0.95	1.15
Conflict resolution	0.58	0.45	1.29	1.22	0.85	1.44
Betrayal	0.27	0.23	1.17	1.20	0.96	1.25
Help/guidance	0.42	0.32	1.31	1.42	0.99	1.43
Companionship	0.33	0.26	1.27	1.26	0.76	1.67
Intimacy	0.57	0.39	1.46	1.49	0.82	1.83
Exclusivity	N/A	N/A	N/A	1.38	0.87	1.59

level of reciprocity and the degree of mutuality. Measuring the level of reciprocity gave us a basic understanding of whether the existence of a friendship was acknowledged by both children with ASD and their nominated friends. We also conducted analysis on mutuality of friendship quality perception by examining the absolute difference in perception scores between children with ASD and their nominated friends (see Cleary et al. 2002). The results for both superficial and deeper analysis of friendship congruency were compared across mixed and non-mixed dyads.

Reciprocity

The first question this study sought to investigate was at the most basic level of analysis in friendship congruency, namely friendship reciprocity across children with ASD. In our sample, the majority of friendships (n = 42 out of 47; 89 %) across both mixed and non-mixed dyads were reciprocated. One regular friend nomination and two best friend nominations were not reciprocated. Furthermore, two dyads denied the existence of their friendship at the time of interview. This may have been due to the delay between the initial friendship nomination procedure and the time of the FQQ interview, where the dyads were required to once again state or confirm their friendship.

The present study employed a broadly similar procedure to calculate friendship reciprocation rate as previous studies (Chamberlain et al. 2007; Kasari et al. 2011; Rotheram-Fuller et al. 2010). Nevertheless, there were two important differences in the friendship nomination procedure used in the current study, which means that comparison of friendship reciprocity with previous studies should be conducted cautiously. First, the friendship nomination was not limited to peers in the same classroom as the child with ASD. Second, although children in our study initially nominated three possible friends in conjunction with their teachers, analysis of reciprocation was done with only one child from these nominations, the child for whom parental consent was returned or where more than one consent was

returned, the child who was nominated as the better friend on the day of interview.

In contrast to earlier findings (Chamberlain et al. 2007; Kasari et al. 2011; Rotheram-Fuller et al. 2010), best friendships of children with ASD in the present study were more often reciprocated. The best friend reciprocation rate in the present study was 19 % as compared to 11.3 % in Kasari et al. (2011), 11.6 % in Rotheram-Fuller et al. (2010), and 13 % in Chamberlain et al. (2007). However, the best friendship reciprocation rate in our sample was considerably lower when compared to the reciprocation rate of typically developing children reported in previous studies. For example, Kasari et al. reported a reciprocation rate of 44.9 %, Rotheram-Fuller et al. reported 47.8 % and Chamberlain et al. reported 58 %. One obvious possible explanation could be that our study contained a large number of non-mixed dyads, where both children in the dyad had a disability. Further analysis on best friendship reciprocation rate across dyad status, however, revealed a similar number of reciprocated best friendship nominations (four mixed dyads compared to five non-mixed dyads).

In our study, friendship nominations were categorized as voluntary, confirmed or non-confirmed. Webster and Carter (2013) found that compared to confirmed friendship, voluntary friendship nominations better indicate the presence of the three basic characteristics in friendship, namely mutual liking, mutual enjoyment and shared interaction. Thus, this may be a more valid indicator of genuine reciprocation. In the present study, 42 out of 47 friendship dyads were nominated voluntarily by participants with ASD, whereas, of the remaining five dyads, three dyads were confirmed friendship nomination and two dyads were non-confirmed. Overall, there was a high rate of voluntary nominations, which could be considered as an encouraging sign that the majority of friendships were genuinely reciprocated. In summary, it would appear that although there was a high overall level of reciprocation of friendships in our sample, particularly voluntary reciprocation, the rate of best friend reciprocation was substantially lower

than that reported previously for dyads involving typically developing children.

Mutuality

Previous researchers have often compared perception of friendship quality between relationships involving children with ASD and those only involving typical peers (e.g., Bauminger et al. 2008b; Kasari et al. 2011; Calder et al. 2013), but comparison of perception between children with ASD and their friends within the same relationship with regard to mutuality has not been previously conducted.

In the present research, there was a significant absolute deviation from zero for all the FQQ subscales with associated large effect sizes. This indicates that in comparison to their nominated friends, children with ASD had substantial differences in perceptions of their friendship quality. Perhaps surprisingly, there was no main effect of dyad status, indicating that mixed and non-mixed dyads did not show significant differences in mutuality. However, some differences were observed across the FQQ subscales for combined groups. Conflict resolution and intimate exchange both had significantly higher congruence scores than conflict and betrayal, and intimate exchange similarly had higher congruence scores than companionship and recreation. Descriptively, the largest discrepancies were observed in conflict resolution, followed by intimate exchange. Thus, the greatest differences in perceptions surrounded the extent to which disagreements in the relationship were resolved and to which friendship was characterized by intimate disclosure of personal information and feelings. The high proportion of reciprocated friendships but relatively small numbers of reciprocated best friendships may well reflect the lack of congruence in perceptions of intimate exchange.

The larger discrepancy in the area of intimate exchange might be a direct reflection of the core social deficit of ASD, which would impact on the child's ability to understand more intimate aspects of a relationship. Children with ASD typically face challenges in emotional recognition and understanding (Kuusikko et al. 2009). Previous researchers have shown that both adults and children with ASD displayed difficulties in recognizing and understanding complex emotions such as intimacy, where there is an added component of attributing cognitive state to the labeled emotion (Golan et al. 2008; Golan et al. 2015).

Another possible reason for the existence of larger discrepancies in intimate exchange and conflict resolution could be related to the characteristics of the items. Some of the items contain somewhat more abstract and emotionally laden concepts (e.g., Make up easily when we have a fight, Talk about how to get over being mad at each other, Tell

each other private things). These may be more difficult for children with ASD to understand and accurately evaluate. In contrast, the preponderance of items in the other scales are often more concrete (e.g., Sit together at lunch, Tells me I'm pretty smart).

Based on the known deficits in the area of social skills and communication for children with ASD (American Psychiatric Association 2000, 2013), the existence of disparity in the level of perceived friendship quality between the dyad partners is not surprising, particularly in the area of intimacy. Nevertheless, the significant and large differences in friendship quality perceptions observed in the present study are consistent with the finding by Cleary et al. (2002) for typically developing children. No clear pattern of differences could be identified across the FQQ subscales for either our sample or that of Cleary et al. Apart from the study of Cleary et al., there are few comparative data on the degree of congruence in friendship in typically developing children.

It might be expected that the degree of friendship quality reported would be related to the severity of symptomotology, as measured by the SRS. It is of interest to note that no significant relationship was evident in the current study. It is possible that the size of the current sample did not allow the detection of a relationship. Consequently, it is advisable that caution be taken in interpreting the current data, and replication is suggested.

In future, direct comparative studies between children with ASD and typically developing children should be conducted to give further insight into whether mutuality differs systematically between the two groups, as might be predicted. Furthermore, the differences in friendship quality of only one friendship per participant were investigated in the present study. Examination of perceptions across a number of friendships may offer a better understanding of a child's overall friendship relations. Future researchers might systematically examine differences in friendship quality perceptions between a child and his/her friends across several reciprocated friendship relations.

Limitations

A number of limitations should be noted in this present study. First, an adapted format of the response scale for the FQQ (3 point instead of 5 point scale) was used in the present study. The 3-point response scale was adopted in this study based on the successful application of this adaptation in previous research with younger children with developmental disabilities (Webster and Carter 2010). However, the more restricted response scale might have influenced the results, perhaps masking differences that would be evident with an expanded response scale.

Second, the data in the present study were collected opportunistically as part of a larger investigation. Hence no normative data were available for point of comparison.

Third, there was an unavoidable time gap between the points when children nominated their friends and the administration of the FQQ. Nevertheless, friendship has been defined as a stable relationship (Poulin and Chan 2010), so a degree of persistence over time would be expected.

Conclusion

Most friendships in children with ASD were reciprocated in the present study, suggesting that many children can and do have a reciprocated friendship. Further analysis suggested substantial differences in friendship quality perceptions within dyad partners regardless of whether the dyad was mixed or unmixed. This is consistent with previous research with typically developing children, in which differences in friendship quality perceptions of similar magnitude were also reported. It is important for researchers and practitioners to realize that children with ASD might have substantially different perceptions of friendship than their partners. For that reason, in evaluating friendship, it is crucial to consider the perceptions of both members of the dyads. Finally, further research including direct comparisons of children with ASD and typically developing children may offer insight into the extent and nature of the differences across the two populations.

Author Contributions NP conceived of the study, participated in its design and coordination, interpretation of data and drafted the manuscript; MC conceived of the study, participated in the design and interpretation of the data and help to draft the manuscript; JS participated in the design and coordination of the study and help to draft the manuscript; NS performed the statistical analysis; All authors read and approved the final manuscript.

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CHAPTER 4: FRIENDSHIP SATISFACTION IN CHILDREN WITH AUTISM SPECTRUM DISORDER AND NOMINATED FRIENDS

Chapter Overview

This chapter contains a manuscript (Petrina, Carter, Stephenson, & Sweller, in press) examining the issue of friendship satisfaction in children with ASD and their friends. Data from this study were collected at a different point in time to those presented in Chapter 3. Although the participant samples overlapped, there were different numbers of participants in each study. Limited attention has been given to the investigation of friendship satisfaction as a measure of friendship success. This issue was identified in the systematic review as a direction for future research. Hence, the current study represents the first quantitative study examining the friendship satisfaction of children with ASD and their friends, both typically developing and with other children with ASD. There were no significant differences observed in the level of satisfaction between children with ASD and their friends in either group. Both groups reported relatively high level of satisfaction in their friendships. This study gives a possible indication that even though friendship in children with ASD might be topographically and qualitatively different to that of typical children, it may still meet the needs of these individuals with ASD and their friends.

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Friendship Satisfaction in Children with Autism Spectrum Disorder and Nominated

Friends

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Abstract

The current study examined the level of friendship satisfaction of children with ASD and their nominated friends (with and without diagnosis of ASD). A total of 77 target children with ASD and friends from 49 nominated friendships participated in the study. Relatively high levels of friendship satisfaction were reported by both target children and their nominated friends with no overall difference between dyads involving typically developing friends and friends with ASD. Analysis at the individual dyad level showed a high level of agreement on the reported level of satisfaction across the target participants and their friends. Limitations and directions for future research are presented.

Keywords: autism, autism spectrum disorder, friendship, friendship satisfaction

Friendship Satisfaction in Children with Autism Spectrum Disorder and Nominated

Friends

Friendship is a unique type of social relationship characterized by interactions that are reciprocal and stable across time, involving a degree of mutual affection and preference (Freeman & Kasari, 1998). Within friendships it is assumed that each party carries a certain expectation regarding the nature of the relationship. Hall (2011) defined this friendship expectation as "cognitive conceptualization about attributes that individuals would like their friend to possess and behaviors that individuals would like their friend to enact" (p. 723). Friendship expectations also act to guide individual behaviors in the relationship and set the standards upon how the behaviors of friends are judged (Hall, Larson, & Watts, 2011). The degree to which friendship expectations are being met is a strong predictor of friendship satisfaction level (Hall et al., 2011).

It has been reported that the majority of children with ASD often experience difficulties in forming and maintaining peer relationships and friendship specifically (Fuentes et al., 2012; Hill & Frith, 2003). It has been suggested that individuals with ASD have distinctive social and cognitive characteristics that may affect their understanding and expectations of friendship (Bauminger, Solomon, & Rogers, 2010). Thus, it cannot automatically be assumed that their expectations of a friendship necessarily correspond to those of typically developing individuals.

Previous researchers have suggested that friendship in children with ASD might be different topographically and qualitatively in comparison to that of typically developing children. Kuo, Orsmond, Cohn, and Coster (2013) found that compared to typical peers, participants with ASD were more likely to have fewer friendships and lower frequency of meeting outside of school. In addition, Rowley et al. (2012) suggested a lack of relationship stability as indicated by the lower friendship duration

reported by children with ASD as compared to typical peers. In terms of friendship quality, children with ASD perceived their friendship to be of a lower quality compared to typical children (e.g., Calder, Hill, & Pellicano, 2013; Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011; Solomon, Buaminger, & Rogers, 2011). However, far too little attention has been paid to how these friendships fulfill individual needs and expectations, in other words, how satisfied children with ASD are with their current friendships.

In typically developing adolescents and children, a number of researchers have investigated the pattern of friendship satisfaction (e.g., Bagwell et al., 2005; Jarvinen & Nicholls, 1996; Mendelson & Aboud, 1999; Parker & Asher, 1993; Zarbatany, Conley, & Pepper, 2004). The majority of these researchers employed qualitative measures to evaluate friendship satisfaction, relying mostly on descriptive reports of current friendship by only one partner in the dyadic relationship.

Calder et al. (2013) appear to have conducted the only available study into friendship satisfaction in children with ASD. Children were asked an open-ended question regarding their satisfaction with their current friendships. No satisfaction data from friends were collected. They concluded that children with ASD were generally satisfied with their current friendships, even though their measured level of friendship quality was lower compared to their typically developing classmates. The researchers suggested that lower measured friendship quality might not necessarily indicate that relationships fail to meet individual needs. The question remains, however, whether partners are equally satisfied with the relationship?

Given the dyadic nature of the friendship relations, it is of interest to collect friendship satisfaction data from both members of the dyad. In recent years, there has been an increased number of children diagnosed with ASD and many attend

mainstream educational settings (Hay & Winn, 2012; Roberts & Simpson, 2016). This setting creates the opportunity for children with ASD to form friendships with classmates without ASD (Grindle et al., 2012; Sainato, Morrison, Jung, Axe, & Nixon, 2015). Bauminger et al. (2008) have reported differences in the observed friendship manifestation across children with ASD that are in the mixed (children with ASD and typically developing peers) as compared to non-mixed dyads (only children with ASD). Specifically, they reported higher dyadic interaction qualities and positive social interaction markers (e.g., reported level of fun, closeness, and harmony) in the mixed friendship group when compared to friendships in the non-mixed group.

Although there is consistent evidence that the measured level of friendship quality is lower for children with ASD, there are limited data on the degree of satisfaction with friendships. In addition, the level of satisfaction of friends of children with ASD does not appear to have been substantively examined. The aims of this study were to: a) investigate the level of friendship satisfaction across children with ASD and their friends; b) to compare friendship satisfaction level between mixed and non-mixed dyads; and c) to examine salient features of friendship that might be related to satisfaction as perceived by children with ASD and their friends.

Method

The students participating in the current analysis were part of a large multiyear study ("Autism Educational Outcomes Study"), which was designed to investigate two different models of education service delivery for students with ASD in Australia. The two models of service education service delivery were a satellite class model or educational placement within a mainstream class. The satellite model is currently implemented in New South Wales (NSW). In this model, students were placed in a special class within a regular school prior to a gradual transition into mainstream

classrooms. In South Australia (SA), a consultative support model is employed, in which children were supported in mainstream classes from the point of school entry. Only data regarding friendship satisfaction will be addressed in this study.

Participants

Participants were children who met the following inclusion criteria: (a) current enrollment in Kindergarten (Reception) to Year 3 at the start of the project; (b) a formal diagnosis of Asperger's disorder or autistic disorder by a pediatrician or psychologist using DSM-IV diagnostic criteria; and (c) intellectual functioning within normal limits or within the mild range of intellectual disability according to a formal diagnostic assessment. The total sample of participants included 77 target children and friends involved in 49 relationships. Of these, 22 relationships involved 22 typically developing peers and 27 relationships involved a total of nine different friends with an ASD diagnosis. A number of target children with ASD in NSW were both a target child in the study and also the nominated friend of another target child, reporting either on the same friendship relation (n =10) or on two different friendship relations (n = 7). All the target children whose nominated friends had an ASD diagnosis attended a satellite class. The target children were between the ages of 5.81 and 10.42 years (M = 8.49, SD = 1.11) during the time of data collection, and included 62 boys and 15 girls. The majority of the IQ scores of the target children were obtained primarily using the Wechsler Intelligence Scale for Children (WISC-IV; Wechsler, 2003). The other IQ measures used were the Fifth Edition of the Stanford–Binet Intelligence Scales (SB5; Roid, 2003) and the Wechsler Preschool and Primary Scale of Intelligence–Third Edition (WPPSI–III; Wechsler, 2002). In addition, data on the severity of autistic symptomatology of the target children were also gathered using the Social

Responsiveness Scale (SRS; Constantino & Gruber, 2005). Table 1 presents the characteristics of the participants in this study.

Where consent could not be obtained from nominated friends, interviews were conducted with the target children only. No demographic data of nominated friends were collected, unless the nominated friends were also target children.

Selection of Friends

A number of steps were taken to identify friends of the target children. First, target children were asked by their classroom teachers to nominate three friends. Invitation letters and forms to obtain informed consent for participation in the study for the three friends were then sent to the parents of these nominated friends. If the target child could not identify three friends, invitation letters were sent to peers with whom the child with ASD interacted the most, as identified by the teacher. Parents of friends returned consent forms to the researchers using enclosed reply paid envelopes. For operational reasons, the typical delay between return of the consent form and the administration of the questionnaire ranged from two to eight weeks. The child for whom parental consent was received was asked to complete the friendship satisfaction questionnaire on the day of data collection. If consents from different nominated friends were returned, the child with ASD was asked to confirm which friend was a better friend on the day of the interview, and this friend was then interviewed. Friendship satisfaction data of nominated friends were not collected if no parental consent was received.

Data Collection Procedures

Interview instrument. A two-part questionnaire was designed for the present study using questions adapted from Parker and Asher (1993) and the McGill Friendship Questionnaire (Mendelson & Aboud, 1999). The first part contained five statements

(with the addition of a repeated item) worded in plain English, suitable for younger age students with basic language skills. Participants were required to rate across a 3-point scale format the truth of each statement in reference to their friendship ("never" = 1, "sometimes" = 2, and "always" = 3). The statements were: 1) My friendship with *(insert friend's name)* is going well; 2) My friendship with (insert friend's name) is better than most friendships; 3) I feel happy when I am with (insert friend's name); 4) I have a good friend; and 5) I am happy with my friendships. The first three items of the questionnaire measured friendship satisfaction with a specific nominated friend. The last two items measured friendship satisfaction of friendships in general. The administration of the questionnaire took an average of ten minutes. A number of dimensions of friendship satisfaction were analyzed, specifically the perception of the current state of friendship, satisfaction of friendship in relation to other friendships, and the level of happiness felt with the friendship. The total score for the scale was calculated by totaling the individual item scores. The Cronbach's alpha of the friendship satisfaction questionnaire was 0.76 (n = 109), suggesting good internal consistency

A repeat item was added as the second last item of the questionnaire as a reliability measure (item 6). For the target children, 92.2% of the repeat items were in complete agreement and 7.8% were 1-point different. For peers, 87% of the repeat items were in complete agreement and 13% were 1-point different. No 2-point differences were observed across the two groups.

The second part of the questionnaire was an open-ended question requiring participants to provide a description of their current friendship and characteristics of friends that might have relevance. Initially, the research assistant asked: "Tell me about your friendship with (insert friend's name)". If the participant gave a brief response or

an off-topic answer, the interviewer had the option of asking probe questions. Given the variation in language ability, attention, social capacity and age of the participants, follow up questions were discretionary, and the interviewer adjusted the wording to the level of the child. The four areas for probe questions were: a) friendship status (best friend, regular friend, school friend, etc.); b) shared activities (in and outside of school); c) characteristics of friend (helpful, understanding, fun, naughty, etc.); and d) conflict (presence and absence of conflict, conflict resolution).

The first author entered all the data recorded by the interviewers into a spreadsheet. The accuracy of the data entry was then assessed using the double entry method, which was applied to ten percent of the quantitative data. No error of data entry was found in this study.

Procedure

Trained research assistants administered the questionnaire individually to participants at their schools. Each question was read aloud and all participants were given a cue card containing pictorial symbols for the 3-point scale to assist them in selecting the appropriate answers (different colored facial expression symbols representing never, sometimes, and always). If a "yes" was given as a response, the research assistant would seek to clarify the answer by saying "Is that some of the time or all of the time?" or a similar phrase, to elicit a sometimes/always responses. All "no" responses were considered to be "Never". All participants with a known diagnosis of ASD completed the questionnaire for only one friend at a time. However, typically developing nominated friends completed the questionnaire for two friendships simultaneously (i.e., a friendship with the target child and one of the names the child nominated as a friend in the beginning of the interview, which served as a distractor). The data collected for the distractor friendship were discarded. Given that typically

developing peers may not have been aware that their friend had ASD, this was considered an appropriate strategy to avoid drawing unwarranted attention to children with ASD.

Results

Figure 1 provides descriptive data on individual items for the reported level of friendship satisfaction for target children with ASD and their nominated friends in both mixed and non-mixed dyads. Relatively high levels of friendship satisfaction were reported by both target children and their friends on most items, with the lowest level of satisfaction reported for item 2. For mixed dyads, friends reported slightly higher satisfaction than the target children on three of the five items, and for non-mixed dyads, friends reported higher satisfaction on one item. However, a similar pattern of satisfaction was observed across the dyad status. Items that were referring to general friendships (items 4 and 5) tended to be rated higher for both non-mixed and mixed dyads, than items referring to specific friendships (items 1, 2, and 3).

A two-way ANOVA was carried out to analyze the effects of dyad status (mixed or non-mixed, between subjects) and respondent status (participant with ASD or nominated friend, within subjects) on the total scores for friendship satisfaction. There was no main effect of dyad status ($F(1, 47) = 1.54$, $p = .22$, partial $\eta^2 = .03$), indicating that averaged across respondents, there was no difference in the level of friendship satisfaction between mixed and non-mixed dyads. Averaged across dyad status, children with ASD reported similar level of satisfaction ($M = 12.65$, $SD = 2.07$) to nominated friends ($M = 12.59$, $SD = 1.91$) ($F(1, 47) = .17$, $p = .69$, partial $\eta^2 = .004$). Finally, there was no significant interaction observed between the dyad status and the respondent status ($F(1,47) = 1.50$, $p = .227$, partial $\eta^2 = .03$).

The analysis outlined above involved data from all participants present in the dataset. Given the complex dependencies in the data, it was deemed necessary to analyze whether any differences existed when data from participants who contributed as both target children and nominated friends were removed. The first analysis was run excluding those participants ($n = 10$) who acted as both target child and friend, and reporting on only one friendship relation. Second, participants ($n = 7$) were excluded who were both a target child and a nominated friend, but reported on different friendships. The final analysis combined the two exclusions mentioned above. No differences in the pattern of results were found for these three analyses as compared to the analysis outlined above involving all the participants. Furthermore, multilevel models were run using maximum likelihood estimation due to some missing data from the nominated friends, which meant that children were excluded from the analyses that used list wise deletion. Again, there was no difference in the pattern of significance observed.

It was of interest to investigate the degree of agreement in friendship satisfaction at the individual dyad level. Individual differences in ratings were calculated for each item by deducting the score of the target child with ASD from that of the friend. Thus, a score of +2 would indicate the friend rated the item two points higher than the target child and a score of zero would indicate that ratings were identical. These data are presented in Table 2. More than half of the participants reported identical scores for friendship satisfaction in both mixed and non-mixed dyads with the exception of item 1 for non-mixed dyads, and items 2 and 3 for mixed dyads. The majority of the differences were of one-point difference, and there were only seven two-point disagreements.

Thematic analysis was conducted for the qualitative data collected through the open-ended question. Initially, all three authors read through the descriptive data to generate themes for initial coding and these were then piloted on the data from ten percent of the participants ($n = 8$). Subsequently, possible themes were further discussed and a final set of 11 themes was agreed upon by the three authors. These themes were practical support or help, the presence of conflict, lack of conflict, liking, positive feelings, interest and activities, intimate exchange, physical characteristics, personality characteristics, friendship status, and quality of friendship. The descriptions of the type of interest and activities mentioned were also extracted for analysis. The second and third author independently coded twenty percent of the data for reliability with inter-rater reliability of 96% calculated by dividing the number of agreements by the number of responses and multiplying by 100.

Figure 2 presents the percentages of target children ($n = 77$) and identified relationships ($n = 49$) in which a theme was mentioned. Overall, both groups reported similar themes in describing their friendship. Interest and activities were reported most often, followed by description of personality characteristics, comment on friendship status, lack of conflict, and quality of friendship. Intimate exchange was the theme least mentioned by both the target children and their friends. Practical support was not mentioned frequently, and was mentioned more by participants with ASD than friends. Lack of conflict was mentioned more often than the presence of conflict. The majority of the target children and their friends mentioned a number of interests and activities that they do together. The most commonly mentioned activities were video games and computer games, followed by sports, playground games (e.g., chasey, hide and seek, dungeons and dragons, hoop), watching movies or TV, board games (e.g., Connect 4, chess), drawing, and playing Lego.

Slight differences were observed across friends with and without ASD across a number of themes as presented in Table 3. Those friends with ASD more often mentioned the aspect of practical support or help in their description of friendship. On the other hand, friends without ASD more often mentioned aspect of friendship status and friendship quality in their description of friendship.

Discussion

There has been limited investigation of the level of friendship satisfaction of children with ASD and their friends. Hence, the aim of the present study was to systematically analyze the level of friendship satisfaction as reported by both children with ASD and their friends in mixed and non-mixed dyads. The degree of congruency between the level of friendship satisfaction across the two members of the dyads (target children and their friends) was also examined. Qualitative data were presented on salient features of friendship that might relate to reported level of satisfaction by children with ASD and their friends.

No significant differences were observed in the total level of friendship satisfaction level across mixed and non-mixed dyad status, and both groups reported reasonably high levels of friendship satisfaction. The present findings are in accord with the only available study examining friendship satisfaction in children with ASD. Calder et al. (2013) found that children with autism qualitatively reported satisfaction for their current friendship despite lower scores than typically developing peers in friendship quality as measured by Friendship Quality Scale (FQS; Bukowski, Hoza, & Boivin, 1994). The present results indicated relatively high friendship satisfaction for children with ASD, suggesting that the relationships appear to satisfy their needs.

Studies with typically developing children indicate that the functions and perception of friendship varies across age. In the early years the foundation of

friendship is often based on overt characteristics, such as shared interests and common activities (Newcomb & Bagwell, 1995; Schneider, Wiener, & Murphy, 1994). Given the age of the participants in the study, it is possible that they had a limited perception of friendship, in which they viewed companionship as the central feature of their relationship. Some support was offered for this interpretation in the thematic analysis of the open-ended questions. Both target children and their friends frequently mentioned the theme of 'interest and activities' in describing their current friendship. Thus, the reported friendship satisfaction in the present study could be relatively high because expectations of the function of friendship might be less complex than that of older children and may not involve more complex psychological constructs (e.g., intimacy, self-disclosure, loyalty).

This pattern might be compounded in children with ASD by core social deficits that may impact on understanding and definitions of friendship. For example, in comparison to typically developing peers, individuals with ASD often fail to provide a definition of friendship that incorporated the three central dimensions of affection, intimacy, and companionship (Bauminger & Kasari, 2000). Participants with ASD across a number of age groups, often report companionship as the basic component of the friendship relations (Calder et al., 2013; Carrington, Templeton, & Papinczak, 2003). They also tended to define companionship as completing mutually enjoyable activities together and having similar interests (Daniel & Billingsley, 2010). In addition, Rosetti (2011) and Howard, Cohn, and Orsmond (2006) suggested that only in older participants with ASD did some concepts become incorporated into definitions of friendship, such as mutual help, protection from victimization and similarity in personality.

Item 2 ("My friendship with x is better than most friendships") was scored the lowest by both participants with ASD and their friends. This was the only item within the friendship satisfaction questionnaire that required participants to compare their friendship to that of others. A possible explanation for the low score could be that this item required children to judge the quality of their friendship in comparison to others, which requires cognitive ability that might not be fully developed in the younger age group. In addition, children may be satisfied with a relationship, without necessarily considering it "better" than that of others.

Items referring to general friendship (items 4 and 5) were rated as higher in satisfaction than those items referring to specific friendship (items 1, 2, & 3). General friendship items tap into current state of friendship satisfaction overall, whereas specific items require participants to rate the items in regards to their satisfaction with a specific friend. This could possibly indicate that the relationships under examination provided less satisfaction than other friendships or that all friendships contributed cumulatively to overall friendship satisfaction. Deciding between these alternative explanations would require comparative data on friendships between comparable typically developing children.

The present study extended the Calder et al. (2013) research by examining the satisfaction of nominated friends. Nominated friends, both with and without a diagnosis of ASD, also generally reported a high level of satisfaction with their friendship. There was no significant difference in total friendship satisfaction score between target children and their friends, for either mixed or non-mixed dyads. Further, when consistency of friendship satisfaction was examined at an individual dyad level, there was exact agreement for an average of 60% of the ratings regardless of their dyad status. The overwhelming majority of disagreements were only one-point

disagreements. In combination, these data would indicate that the perceived friendship satisfaction of the target children was clearly reciprocated by their nominated friends. The current finding is of some interest in that reciprocation might impact on the stability and the maintenance of the friendship. It seems probable that friendship relations are more likely to succeed or persist if both parties are satisfied with the relationship.

Previous examination into the pattern of friendship activity in children and adolescents with ASD suggested that 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; Kuo et al., 2013). This result is consistent with the present data, in which participants most frequently reported playing videogames or computer games. Videogames can assist young children with ASD in their social functioning, in that it can provide a theme for discussion that is appropriate and acceptable within the child's circle of friends (Winter-Messiers, 2007). Furthermore, Kuo et al. (2013) found that adolescents reported greater overall positive friendship qualities and higher degree of companionship when they spent their time with friends playing video games, compared to those who did not play video games with friends.

There are a number of limitations to the present study. First, only participants within normal limits of intellectual functioning or mild range of intellectual disability were recruited. Thus, the results cannot necessarily be generalized to children with lower levels of intellectual ability. Second, given the nature of satellite class setting, some of the participants were contributing data as both target children and nominated friends. While the effects of dependency were examined, ideally data would be independent.

Several questions arise from the present study that could be investigated in future studies. First, an investigation of friendship satisfaction in children with varied level of intellectual ability would extent the results of the current research. Second, there is a clear need for comparative studies comparing friendship satisfaction between children with ASD and typically developing children. Third, previous research has shown that friendship expectations in typical children differ across gender (see Hall, Larsons, & Watts, 2011). As the occurrence of ASD is higher in males as compared to females, it would be interesting to examine the level of satisfaction across gender with a larger sample. Fourth, it has been previously noted that perceptions and expectations of friendship change with maturity. In younger children, such as the participants of this study, friendship is typically framed in terms of companionship and shared interests or activities. As children move into adolescence, issues such as intimacy become more critical. Thus, it is possible that the expectations of friendship and related perception of friendship satisfaction might change for children with ASD and their friends as they enter adolescence. This stands as a priority for future research.

Conclusion

The present research examined the friendship satisfaction in children with ASD and their nominated friends. In general, children with ASD and their friends reported a relatively high level of friendship satisfaction. When examined at the dyad level, a high level of agreement was evident, indicating that friendship satisfaction was generally reciprocated. The findings from the current investigation support the conclusion of Calder et al. (2013), that friendship in children with ASD might be fulfilling their needs and extends this research by indicating that friends report similar levels of satisfaction.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent was obtained from all individual participants included in the study.

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Table 1

Demographic Characteristics of Children with ASD

| | Mean (SD) | |
	Mixed dyad	Non-mixed dyad
Age	8.5 (1.0)	8.5 (1.2)
Full Scale IQ	90.5 (14.9)	76.4 (13.0)
Missing data	2	2
Verbal IQ	88.6 (15.5)	82.2 (15.9)
Missing data	1	-
SRS Scores		
Total	83.7 (13.7)	75.6 (11.7)
Social Awareness	73.2 (12.1)	68.3 (9.5)
Social Cognition	82.5 (12.4)	73.2 (11.6)
Social Communication	79.8 (12.1)	71.5 (11.1)
Social Motivations	71.0 (12.0)	63.3 (14.0)
Autistic Mannerism	87.0 (16.9)	80.6 (13.5)

Table 2.

Differences in the Level of Friendship Satisfaction Between Target Children With ASD and Their Identified Friends Across Dyads

(ASD - Friend)	Item 1			Item 2			Item 3			Item 4			Item 5		
	Mixed dyads	Non-mixed dyads	Total	Mixed dyads	Non-mixed dyads	Total	Mixed dyads	Non-mixed dyads	Total	Mixed dyads	Non-mixed dyads	Total	Mixed dyads	Non-mixed dyads	Total
+2 pt	0	1	1	1	0	1	0	0	0	0	0	0	0	1	1
	(0%)	(5%)	(2%)	(4%)	(0%)	(2%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(5%)	(2%)
+1 pt	2	7	9	12	7	19	6	7	13	0	4	4	3	3	6
	(7%)	(33%)	(19%)	(44%)	(33%)	(40%)	(22%)	(33%)	(27%)	(0%)	(19%)	(8%)	(11%)	(14%)	(13%)
0 pt	21	9	30	5	11	16	15	9	24	21	12	33	19	12	31
	(78%)	(43%)	(62%)	(19%)	(52%)	(48%)	(55%)	(43%)	(50%)	(78%)	(57%)	(69%)	(70%)	(57%)	(64%)
-1 pt	4	4	8	7	3	10	6	5	11	5	4	9	5	5	10
	(15%)	(19%)	(17%)	(26%)	(14%)	(21%)	(22%)	(24%)	(23%)	(19%)	(19%)	(19%)	(19%)	(24%)	(21%)
-2pt	0	0	0	2	0	2	0	0	0	1	1	2	0	0	0
	(0%)	(0%)	(0%)	(7%)	(0%)	(4%)	(0%)	(0%)	(0%)	(4%)	(5%)	(4%)	(0%)	(0%)	(0%)

Table 3.
The Total Number of Friends' Responses to Themes Related to Description of Friendship

	Themes										
	Interest & activities	Practical support/ help	Presence of conflict	Lack of conflict	Likin g	Positive feelings	Intimate exchange	Characteristics (Physical)	Characteristic (Personality)	Friendship status	Quality of friendship
Friends with ASD (relationships = 27)	19	3	2	7	3	3	0	1	13	5	2
Friends without ASD (relationships = 22)	20	1	2	10	4	4	0	0	14	12	8
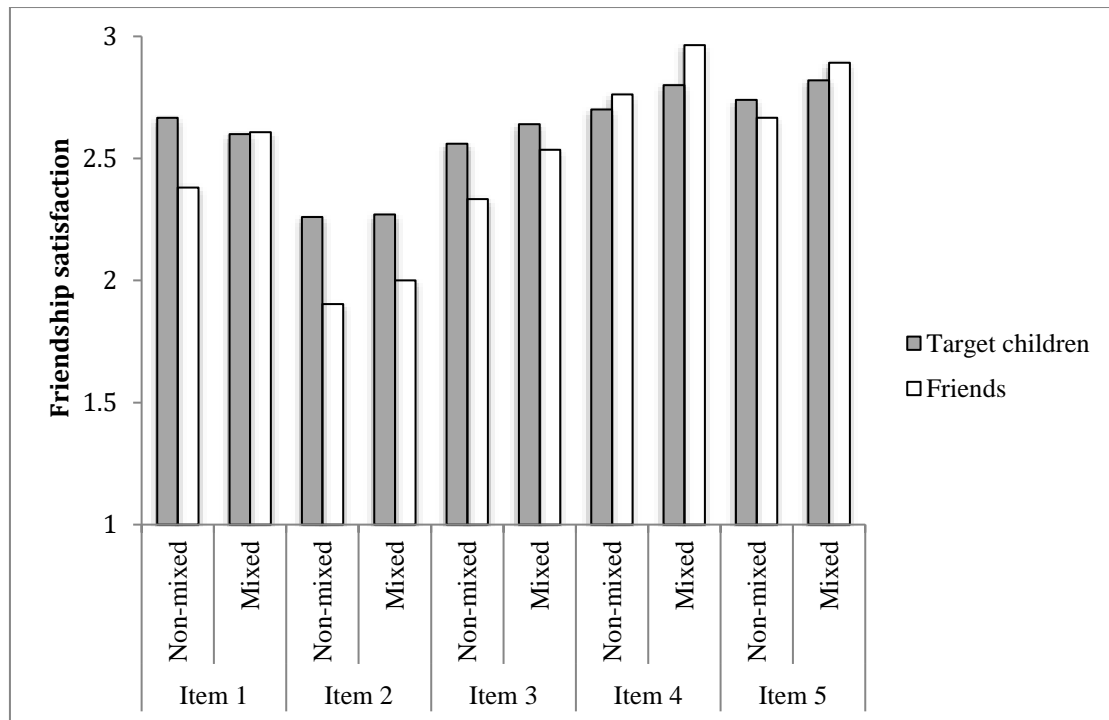
Figure 1. Level of Friendship Satisfaction Across Dyads and Participants' Status. Item 1) My friendship with *(insert friend's name)* is going well; item 2) My friendship with (insert friend's name) is better than most friendships; item 3) I feel happy when I am with (insert friend's name); item 4) I have a good friend; item 5) I am happy with my friendships.
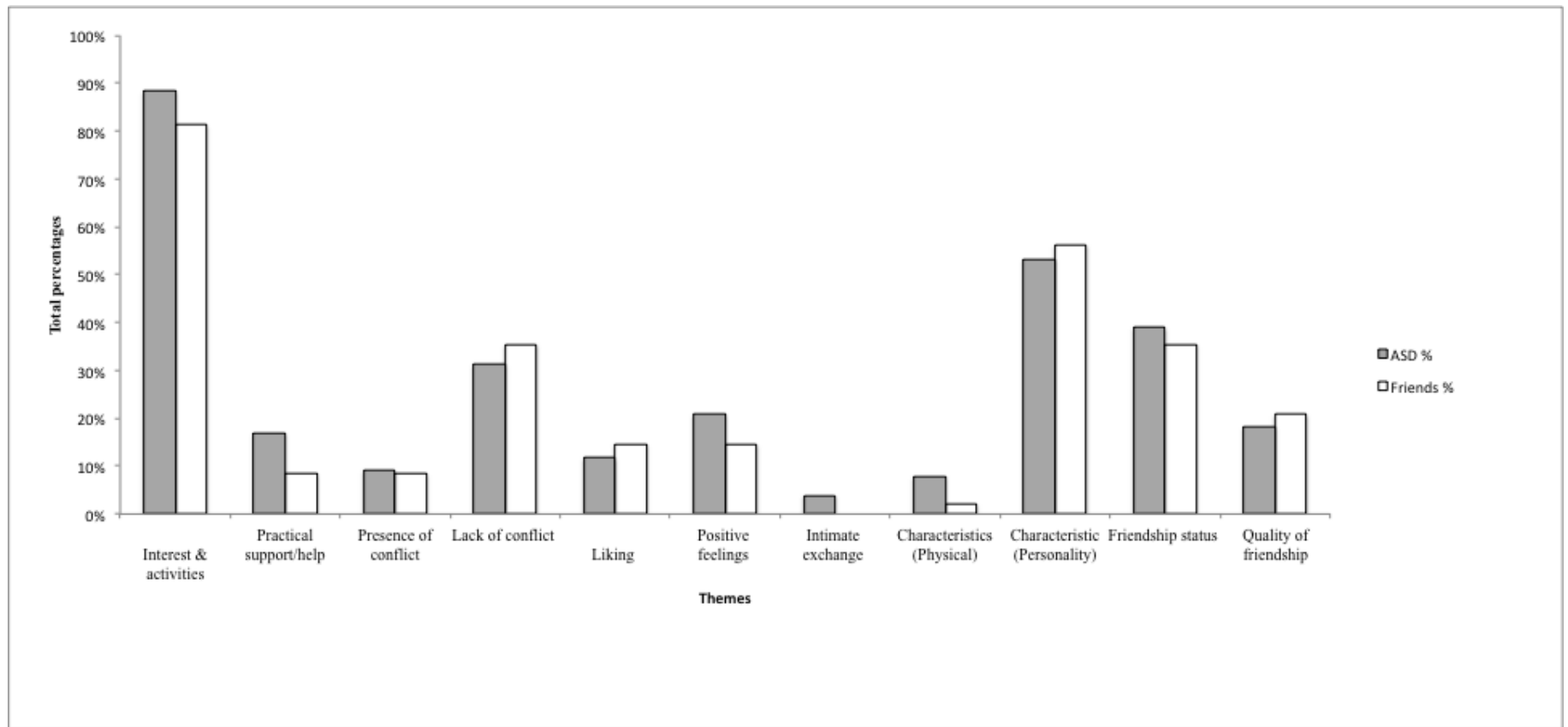
Figure 2. Percentages of Total Possible Responses to Themes Related to Description of Friendship as Reported by Target Child and Identified Friend

CHAPTER 5: PARENTAL AND TEACHER PERCEPTIONS OF THE IMPORTANCE OF FRIENDSHIP AND OTHER OUTCOME PRIORITIES IN CHILDREN WITH AUTISM SPECTRUM DISORDER

Chapter five includes two related research papers: one published in the European Journal of Special Needs Education (Petrina, Carter, & Stephenson, 2015), the other published on Education and Training in Autism and Developmental Disabilities (Petrina, Carter, & Stephenson, in press). Parents and teachers were asked to rate and rank the importance of friendship as compared to other curriculum outcomes (e.g., intellectual and academic skills; social skills; physical skill and motor development; creativity; and emotional skill). The extent to which friendship development was prioritised by parents was analysed in the first paper. The second paper presents the report on how teachers prioritised friendship development for their students with ASD and includes comparisons between how teachers and parents prioritise friendship development. Parents consistently rated all curriculum outcomes as more important in their children's development than did teachers. When forced to rank, friendship was ranked similarly across parents and teachers. On an individual level, the lowest level of absolute agreement between teachers and parents ranking was in the area of friendship. Teachers ranked friendship skills to be of higher importance as compared to other outcome priorities than parents. A possible explanation might be that teachers might be more likely to observe the child in social situations with a broader range of peers, necessitating behaviors pertaining to friendship skills. Hence they might be more aware of the need to prioritise friendship skills.

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importance of friendship and other outcome priorities in children with autism
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Parental perception of the importance of friendship and other outcome priorities in children with autism spectrum disorder

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Parental perceptions of the importance of friendship development in comparison to other outcome priorities are examined in this research. Parents of children with high functioning autism between the age of 5–10 years ($N = 74$) were asked to rate and rank the importance of the following six outcome priorities: friendship, social skills, physical and motor development, intellectual and academic skills, creativity, and emotional capacity. It was predicted that friendship would be highly prioritised by parents, considering the friendship difficulties often experienced by children with autism. Parents reported friendship to be third most highly rated outcome following social skills and emotional skills, although all three were closely rated. When parents were asked to force-rank priorities, friendship was ranked considerably lower than social and emotional development. Level of autistic symptomatology of the child did not seem to influence parent rating or ranking of friendship importance to any great extent. The implications of these findings for future educational service delivery are discussed.

Keywords: autism; autism spectrum disorders; parental perceptions; friendship; intervention priorities

The diagnosis of autism spectrum disorder (ASD) indicates significant impairment in the area of social interactions (DSM 5, American Psychiatric Association 2013), which may specifically result in particular difficulties in establishing peer relationships and friendships appropriate to the child's age level (Fuentes et al. 2012). Friendship is a unique subset of peer relationships based on interactions that are non-contractual, reciprocal and stable across time (Freeman and Kasari 1998). Successful friendship relations have been shown to promote positive social, cognitive and emotional development, all of which are influential in a child's overall sense of well-being (Hartup and Stevens 1999). Conversely, the failure to develop successful friendships in early years of life is a predictor of difficulties with future social relations (Newcomb and Bagwell 1995).

Despite the difficulties in forming and maintaining peer relationships, some previous studies have shown that many children and adolescents with high functioning autism reported having at least one friendship relation that is stable and enduring over time (Daniel and Billingsley 2010; Knott, Dunlop, and Mackay 2006; Rossetti 2011). Their friendships, however, often differ topographically and qualitatively when compared to those of typically developing children (Bauminger and Kasari 2000; Kasari et al. 2011; Locke et al. 2010; see Petrina, Carter, and Stephenson 2014, for review).

For example, Bauminger and Shulman (2003), who used maternal reports to compare friendship patterns in adolescents with ASD to those of typically developing adolescents, found that adolescents with autism have fewer friends, with significantly shorter friendship duration and lower frequency of meetings. Previous comparative studies on perceptions of friendship of children with ASD have also reported lower quality of friendship across dimensions of companionship, security-intimacy, closeness and help as compared to typically developing matched peers (Bauminger and Kasari 2000; Bauminger, Shulman, and Agam 2004; Bauminger et al. 2008; Chamberlain, Kasari, and Rotheram-Fuller 2007). Interestingly, based on semi-structured interviews, Calder, Hill, and Pellicano (2012) reported that children with ASD stated that they were satisfied with their friendships, despite their friendships being topographically different and lower in quality as compared to their typical peers.

Parents undoubtedly play an important role in influencing their children's lives and ensuring their optimal physical, social and emotional development. The investigation of parents' perspectives on the importance of different educational outcomes is important for a number of reasons. Firstly, the use of parental reports in the investigation of developmental needs in children with autism is important because recent studies suggested that parent and teacher perceptions tend to differ in regards to children's behavioural problems in general and social functioning specifically (Jepsen, Gray, and Taffe 2012; Murray et al. 2009). Secondly, parents reported higher levels of satisfaction with the quality of educational services provided, when reciprocity of communication exists between parents and professionals (Renty and Roeyers 2006). Thirdly, active parental involvement has also been seen as an important factor in supporting individuals with ASD (National Initiative for Autism: Screening and Assessment [NIASA] 2003). For example, the value of active involvement of parents of children with disabilities in facilitating friendship related behaviours has been successfully demonstrated (e.g. Frankel et al. 2010; Frankel and Whitham 2011; Guralnick 1999; Guralnick et al. 2003; Jull and Mirenda 2011; Ladd and Hart 1992).

Researchers have investigated parent perception of the importance of different outcome priorities for children with intellectual disabilities (see Westling 1996, for review). In these studies, parents of children with mild and moderate disabilities typically rated friendship/social relationship skills as less important than functional skills and academic skills (Hamre-Nietupski, Nietupski, and Strathe 1992; Lim, Girl, and Quah 1998) or motor and communication skills (Westling 1997). In contrast, parents of students with severe/profound disabilities rated friendship/social relationship as more important than functional and academic skills (Hamre-Nietupski, Nietupski, and Strathe 1992).

Parental outcome priorities in children with ASD have been investigated in a limited numbers of studies (Pituch et al. 2011; Rodger, Braithwaite, and Keen 2004; Spann, Kohler, and Soenksen 2003; Whitaker 2007). In two studies (Pituch et al. 2011; Rodger, Braithwaite, and Keen 2004), researchers gathered quantitative measures of parental priorities across a number of treatment outcomes (e.g. skills in the areas of self-care, domestic and community living, motor, recreational, social, communication, academic) using a rating system. Whereas, Spann, Kohler, and Soenksen (2003) and Whitaker (2007) used open-ended questions to collect qualitative parental data. Social skills were reported to be of highest importance across three studies (Pituch et al. 2011; Spann, Kohler, and Soenksen 2003; Whitaker 2007). Conversely, parents in the Rodger, Braithwaite, and Keen (2004) study rated communication skills as being of higher priority, followed by behaviour and social interaction.

Although previous researchers have used rating systems to evaluate the importance of parental priorities, they have not specifically asked parents to rank outcome priorities in order of importance. The choice of methodology employed to investigate parental perceptions may have an effect on the findings. Unlike rating, forced ranking may allow greater differentiation of the importance of each outcome (McCarty and Shrum 2000; Vanleeuwen and Mandabach 2002). Specifically, rating allows parents to assign a more precise weighting to the importance of each outcome priority, whereas ranking requires parents to prioritise and to differentiate the relative importance of each outcome. Most crucially, extant research has not provided examination of the importance of friendship development in relation to other outcome priorities.

The research to date on the perceptions of parents often employed a diverse sample of children with a diagnosis of ASD. For example, Pituch et al. (2011) recruited participants across a wide range of age (2–21 years), with varying degrees of language abilities (fluent to non-verbal) and intellectual ability (superior to moderate disability). In addition, participants were enrolled in a wide variety of educational settings (public school, private school, home-schooled, early intervention clinic, day care centres). Similarly, Spann, Kohler, and Soenksen (2003) recruited parents of children with autism between the age ranges of 4 to 18 years. There is evidence to suggest that parental outcome priorities may change across age groups. For example, D'Amato and Yoshida (1991) examined parental priorities of children with intellectual disabilities. Parents of children under the age of two highly prioritised the development of gross motor skills. Parents of pre-school age children, on the other hand, prioritised both communication and toileting skills. For primary age children, parents emphasised communication skills, self-help and proficiency in gross motor skills.

Given the nature of the social deficits in ASD, the specific difficulties associated with friendship and the active role that parents may play in facilitating friendship (Haring 1991), it was of interest to determine how parents viewed the importance of friendships in relation to other educational outcomes such as academic skills. Furthermore, the current study provides analysis of the perceived importance of friendship by parents of children with ASD as compared to other outcomes across two different educational settings, specifically a satellite support class model and that of mainstream class placement. Previous studies on inclusion have suggested that parents' choice of inclusive educational placement could be motivated by the possibility that their child might have a greater opportunity to socialise with their peer group and develop friendship (Elkins, Van Kraayenoord, and Jobling 2003; Hanson et al. 2001; O'Connor 2007; Wong et al. 2014). Hence, it is possible that differences might be observed in how parents prioritise social skills and more specifically friendship, with higher priority given to socials skills and friendship by parents of children in mainstream class placement as compared to the support class model.

The current study differs from past research in two ways. Firstly, parents were asked to both rate and rank the importance of friendship development compared to other outcome priorities. Secondly, participants were recruited from a narrower age range (6.4–10.4 years) and were of normal intelligence or within the mild range of intellectual disability. The objectives of this paper are to examine: (a) whether parental priorities differ across educational settings; (b) how parents rate and rank friendships as compared to other outcomes; and (c) how parental priorities differ across level of autistic symptomatology.

Method

The data reported in this paper were collected as part of a larger multi-year study ('Autism Educational Outcomes Study') investigating the efficacy of two different models for education service delivery for students with ASD in Australia. The models under examination were a satellite class model in New South Wales (NSW) in which students were placed in a special class within a regular school prior to a gradual transition into mainstream classrooms, and a consultative support model in South Australian (SA) where children were supported in mainstream classes from the point of school entry. The satellite model in NSW was offered as an option to parents, who could also choose mainstream class placement. Only data regarding parent perceptions of the importance of educational outcomes will be addressed in this study.

Participants

Participants were parents or guardians of children who met the following inclusion criteria: (a) currently enrolled in Kindergarten (Reception) to Year 3; (b) a formal diagnosis of Asperger's disorder or autistic disorder by a pediatrician or psychologist using DSM-IV diagnostic criteria; and (c) intellectual functioning within normal limits or within the mild range of intellectual disability according to a formal diagnostic assessment. Two organisations in NSW and SA were asked to nominate eligible children who were currently accessing their services. Parents or guardians who consented for their children to participate in the broader study were included in the current study.

There were 58 boys and 16 girls with diagnosis of ASD in the age range of 6.4–10.4 years ($M = 8.7$) with the mean full scale IQ of 85. The higher ratio of boys to girls is consistent with the incidence of autism being four times more common in boys than girls (Fombonne 2003). Thirty-five of the students were enrolled in satellite classrooms, whereas the other 39 attended mainstream classrooms.

A range of assessments was completed on participants including the Wechsler Intelligence Scale for Children (WISC-IV; Wechsler 2003), Vineland Adaptive Behaviour Scales-II (VABS-II; Sparrow, Cicchetti, and Balla 2005), Social Skills Improvement System (SSIS; Gresham and Elliott 2008) Rating Scales and Social Responsiveness Scale (SRS; Constantino and Gruber 2005a). A summary of the children characteristics is presented in Table 1.

A total of 74 adults participated in the study, of whom, 65 were mothers, seven were fathers and two were grandparents. Table 2 presents the socio-demographic characteristics of the adults participants.

Data collection procedures

Interview instrument

The parent perception scale consisted of two parts. The scale was designed to examine perceptions of parents regarding the importance of six outcome priorities, namely: (a) social skills (the ability to behave and interact with adults and peers in an age appropriate manner); (b) physical skill and motor development (the ability to perform age-appropriate physical activity involving both gross and fine motor skills in the child's muscular coordination); (c) intellectual and academic skills (the ability to form and understand concepts, problem solve and possess an age appropriate

Table 1.   Demographic characteristics children with ASD.

Children	Mean (SD)
Age	8.7 (0.9)
Missing data	2
Full-scale IQ	85 (15.5)
Missing data	3
VABS adaptive behaviour composite	80.2 (9.5)
SSIS social skills	79.1 (12.8)
SRS scores[a]	
Total	81.7 (12.7)
Social awareness	71.4 (11.4)
Social cognition	79.5 (12.0)
Social communication	77.9 (12.4)
Social motivations	69.4 (13.7)
Autistic mannerism	86.4 (16.3)

[a]Guidelines for interpreting SRS total scores: 60T–75T – Mild–Moderate range. Children in this score range often display clinically significant deficits in the area of reciprocal social behaviour, which may mildly interfere with their everyday social functioning; 76T or higher–severe range. Children in this score range often exhibit great difficulties in the area of social functioning. Scores in this range are strongly associated with the presence of clinical diagnosis for ASD (Constantino and Gruber 2005b).

concentration level which is manifested in the child's ability to do well at the level set out by the child's school); (d) creativity (the ability to demonstrate the use of divergent thinking and imagination to generate original ideas); (e) emotional development (the ability to develop perception of self, their own emotions as well as the emotions of others); and (f) friendships (the ability to form and maintain reciprocal peer relationships). The first part of the scale required parents to rate the importance of individual outcome across a 5-point scale format with the descriptors of 'not at all important' (1), 'not very important' (2), 'neutral' (3), 'quite important' (4) and 'very important' (5). In the second part of the scale, parents were asked to assign a forced rank to each outcome (e.g. 1 was assigned to the most important outcome and 6 was assigned to the outcome with the lowest importance).

Procedure

The majority of the data were collected through telephone interview conducted by trained research assistants, but in some cases interviews were conducted in person. In the case of phone interviews, prior to the interview, parents were sent an information sheet containing the 5-point scale and the list of the outcome priorities and their descriptions. As the interviewer read out the instructions, parents were asked to select their answers according to the scale presented on the information sheet.

Results

At the point at which the data were collected, two children in NSW had transitioned from the satellite support class into mainstream classrooms, whereas all children in SA were enrolled in mainstream classes. Initially, it was of interest to determine whether there were differences in the priorities of parents whose children were currently in satellite support classes and those who were in mainstream classes. A series of Mann–Whitney *U* tests were performed (see Table 3) and there were no

Table 2.   Demographic characteristics of adults who completed the questionnaires.

Adults	Total (%)
Number of participants	
Mother	65 (87.8)
Father	7 (9.4)
Grandparent	2 (2.7)
Age	
26–40	42 (56.7)
41–55	30 (40.5)
56 or older	2 (2.7)
Marital status	
Single	10 (13.5)
Married/partner	56 (75.68)
Widowed	1 (1.35)
Divorced	4 (5.4)
Separated	2 (2.7)
Prefer not to answer	1 (1.3)
Highest educational qualification	
High school	24 (32.4)
Vocational training	16 (21.6)
Bachelor	26 (35.1)
Master	7 (9.46)
Doctorate	1 (1.35)
Household income before tax	
0–$36,400	14 (18.9)
$36,401–$74,000	12 (16.22)
$74,001–$160,000	32 (43.2)
$160,001–$360,000	9 (12.1)
$360,001 and over	2 (2.7)
Prefer not to answer	5 (6.7)
Number of children in household	
One	15 (20.2)
Two	38 (51.3)
Three	14 (18.9)
Four	6 (8.1)
Five or more	1 (1.3)
Primary language spoken at home	
English	73 (98.6)
Other	3 (4.0)

significant differences in the rating and ranking of each educational outcome across children in satellite or mainstream classes. Consequently, data were combined for further analysis. Figures 1 and 2 present the mean rank total for each of the outcome for both the rating and ranking procedures.

A Friedman two-way analysis of variance (Stricker 2008) was used to determine whether parents rated and ranked educational outcomes differently. Significant differences in both rating (χ^2 [5, $n = 74$] = 111.1, $p < 0.001$) and ranking (χ^2 [5, $n = 74$] = 188.7, $p < 0.001$) were observed, therefore Conover *post hoc* comparisons were

Table 3.   Mann–Whitney U test results for parental perceptions across educational settings.

Outcome	Grouping variables	df	Rating			Ranking		
			U	Z	p-value	U	Z	p-value
Social	G1: Satellite G2: Regular class	72	620.5	−1.05	0.29	677	−0.06	0.94
Physical	G1: Satellite G2: Regular class	72	613	−0.86	0.38	622	−0.68	0.49
Intellectual	G1: Satellite G2: Regular class	72	609.5	−0.87	0.38	629	−0.60	0.54
Creativity	G1: Satellite G2: Regular class	72	583	−1.16	0.24	655	−0.32	0.74
Emotional	G1: Satellite G2: Regular class	72	645	−0.53	0.59	625	−0.64	0.51
Friendship	G1: Satellite G2: Regular class	72	660	−0.32	0.74	641.5	−0.45	0.64
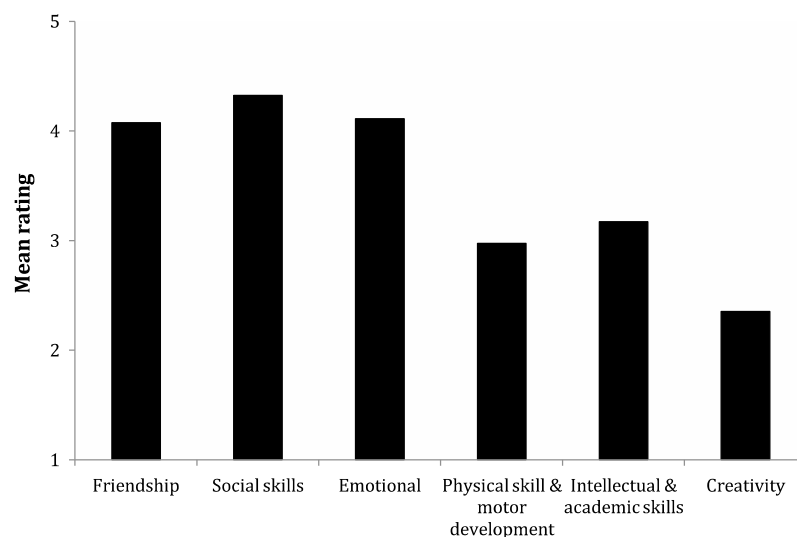
Figure 1.   Mean ratings of importance.

conducted. Tables 4 and 5 present the results for the paired comparisons between the different outcome priorities. All differences were significant for the ratings outcomes except for the comparisons between: (a) emotional and social skills; (b) friendship and social skills; (c) intellectual and academic skills, and physical skill and motor development; and (d) friendship and emotional. Comparisons of means for the ranking procedure were all significant with the exception of the comparison between friendship and intellectual and academic skills.

With regard to parent ratings, friendship was not significantly different to social skills and emotional development, and mean scores for all these areas were within 0.25. In contrast, intellectual and academic skills and physical and motor skills were rated approximately a full point lower than friendship, and creativity approximately two points lower than friendship. The differences in the mean ratings for these areas
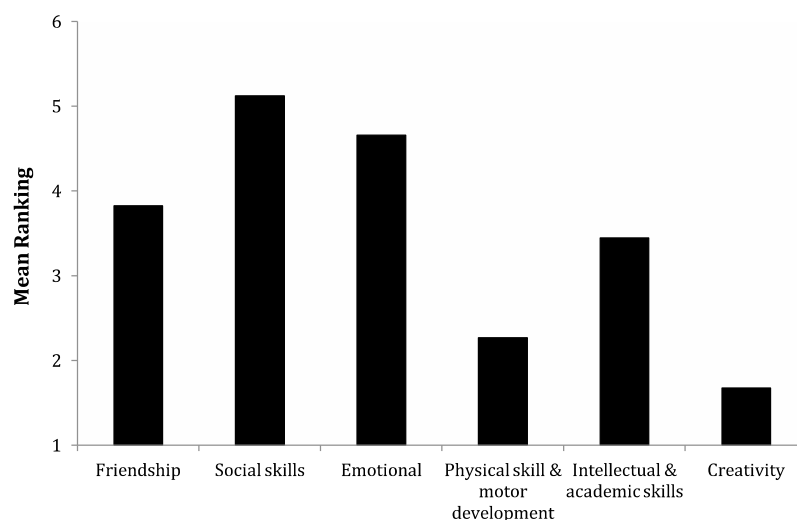
Figure 2.   Mean rankings of importance.

Table 4.   Friedman *post hoc* analysis and mean rank differences for ratings.

	Social skills	Physical skill and motor development	Intellectual and academic skills	Creativity	Emotional
Physical skill and motor development	−1.35***	—	—	—	—
Intellectual and academic skills	−1.15***	0.19	—	—	—
Creativity	−1.97***	−0.62**	−0.81***	—	—
Emotional	−0.21	1.13***	0.93***	1.75***	—
Friendship	−0.25	1.10***	0.90***	1.72***	0.03

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 5.   Friedman *post hoc* analysis and mean rank differences for rankings.

	Social skills	Physical skill and motor development	Intellectual and academic skills	Creativity	Emotional
Physical skill and motor development	−2.85***	—	—	—	—
Intellectual and academic skills	−1.67***	1.17***	—	—	—
Creativity	−3.44***	−0.59**	−1.77***	—	—
Emotional	−0.45*	2.39***	1.21***	2.98***	—
Friendship	−1.29***	1.55***	0.37	2.14***	−0.83***

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
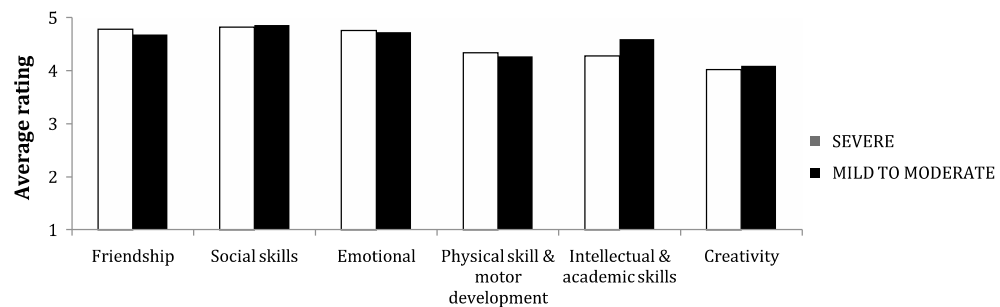
Figure 3. Parental ratings of curriculum priorities as grouped according to their children's level of autistic severity.
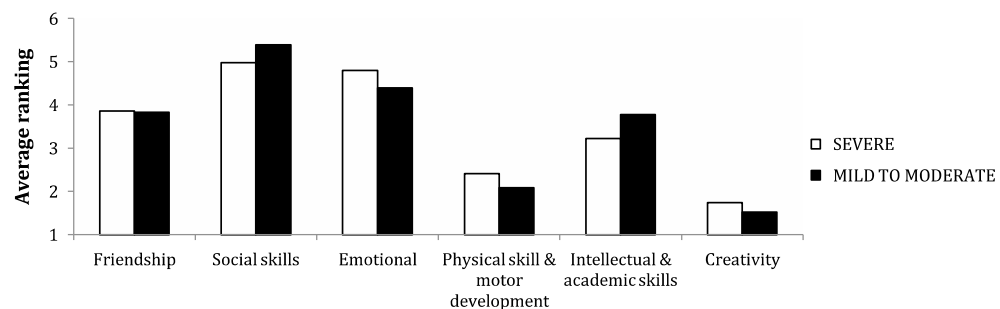

Figure 4. Parental rankings of curriculum priorities as grouped according to their children's level of autistic severity.

as compared to areas of social skills, emotional development and friendship were statistically significant. When parents were forced to rank areas in order of priority, friendship was ranked third and the differences between friendship, social skills and emotional development were statistically significant. There was no statistical difference between parent rankings for friendship and intellectual and academic skills.

Parent priorities for different outcomes were compared with their child's level of autistic severity as measured by the Social Responsiveness Scale (SRS; Constantino and Gruber 2005a). It can be seen from Figure 3 that friendship, social skills and emotional skill were closely rated as the top three curriculum outcomes by all parents, regardless of the severity of their child's autism. Figure 4 shows friendship was ranked similarly by parents of children in the severe range as compared to parents with children in the mild to moderate range.

Discussion

The present study explored parental views on the importance of friendship as compared to other outcome priorities, such as social skill, emotional capacity, physical and motor development, intellectual and academic skill, and creativity. In contrast to previous studies, both parental ratings and rankings of the importance of friendship were reported. Friendship development was also differentiated from social skills in general, using a sample of children with diagnosis of ASD of normal intelligence or within the mild range of intellectual disability.

Parents rated the importance of friendship as closely similar to social and emotional capacity. While the general pattern was similar across the rating and ranking procedures, some interesting differences arose when parents were requested to rank. Specifically, differences between friendship and social skills as well as emotional development become significant. A drop in the relative importance of friendship can also be seen in the ranking procedure, indicating that parents would prioritise social skills and emotional development over friendship. This highlights the value of using both approaches to collection of data from parents because it requires parents to make a prioritised decision on the variables being examined.

It is possible that parents may have viewed the mastery in social skills and emotional development as contributors to the development of friendship. Although it is reasonably assumed that development of friendship may depend on the development of social and emotional skills, friendship development involves a nuanced and specific set of capacities (Tullemans 2012), which may require focused intervention programmes. It may not be reasonable to expect that more generally focused social skills and emotional development programmes will necessarily lead to success in friendship formation.

The generally high priority given to social skills in the present research is broadly consistent with previous research of children with ASD. In previous studies, however, no explicit differentiation was made between social skills, emotional skills and the ability to form and maintain friendships. For example, Spann, Kohler, and Soenksen (2003) reported social skills that encompassed elements of friendship formation and also peer interactions. Rodger, Braithwaite, and Keen (2004) looked at the importance of social interaction as defined by behaviours that accommodate 'social reciprocity of communication', such as turn taking, eye contact and sharing. Pituch et al. (2011) categorised social skills into areas of sharing affection with caregivers, desire for interactions, appropriate interaction with familiar people, appropriate interaction with unfamiliar people and making friends. Their findings differ from the current study in that parents rated formation of friendship as a higher priority compared to the desire for interaction, appropriate interaction with familiar people, appropriate interactions with unfamiliar people and display of affection to caregivers. Taken together, this finding suggests that parents prioritised social skill in general above friendship skill specifically.

The constrained sampling adopted in this study allowed comparison of parental priorities across levels of autistic symptomatology within a limited age group. No marked difference was observed in parental priorities across varying level of autistic symptomatology, suggesting a degree of consistency in parental priorities. This may reflect a level of conformity in parental perception of core deficits in the children.

There was no significant difference in parental priorities between parents of children in mainstream classes and those in the satellite class model. This result was unexpected given previous suggestions that the opportunity for greater socialisation and friendship development might have an influence on parent decisions to choose a more inclusive placement. A possible reason is that parents placing their children in the satellite class model do so with the understanding that the placement is temporary. The satellite class model by its nature is an intermediate placement in which children would most likely transition into a mainstream classroom within two years. Differences in parental priorities might be more marked if a more typical type of special class placement was compared to mainstream class placement.

The results of the present study provide some interesting points for comparison to previous studies of children with intellectual disability. Parents of children with mild and moderate intellectual disability typically rated friendship/social relationship skills as less important than functional skills and academic skills (Hamre-Nietupski, Nietupski, and Strathe 1992; Lim, Girl, and Quah 1998), or motor and communication skills (Westling 1997). In contrast, and consistent with the current research, parents of children with severe/profound disabilities rated friendship/social relationship development as more important than functional and academic skills. While the latter result was consistent with the findings in the current study, the explanation may differ. In the present study, the observed ratings may have been related to the ability of children, who were relatively intellectually capable, and to the specific social deficits associated with their ASD diagnosis. Thus, parents might have prioritised social skills because of their children's deficits in this area but may not have given high priority to academic skills because of the level of their intellectual ability. For children with significant intellectual disability, the relative contribution of friendship vs. academics skills to quality-of-life issues may have been a greater consideration.

The relatively high importance assigned to friendship by parents may indicate the need for schools to actively target friendship in their educational programming. Recently, research with children with ASD focusing on strategies to support successful development and maintenance of friendship has been reported (Frankel et al. 2010; Frankel and Whitham 2011), in contrast to simply developing social skills. Nevertheless, given the very limited research in this area, it stands as a priority for further investigation.

In interpreting the present research, a number of limitations need to be considered. First, half of the students are currently enrolled in a satellite class, with the expectations that they will transition to a mainstream classroom setting. In comparison to those parents with children placed in a permanent special school setting, parents in the current study might have different outcome expectations for their children considering the temporary nature of a satellite class. Secondly, the current study recruited samples of parents from city schools across two states in Australia. Hence, the result of this particular study might not be reflective of the broader parental perceptions.

A number of recommendations for future research emerge from this study. Longitudinal studies on parental priorities should be conducted to establish whether parental perceptions change across time. It is also recommended that future research be conducted to investigate teacher perception of the importance of friendship as compared to other curriculum outcomes. Such information may assist the successful alignment of goals in educational plan design involving multiple stakeholders. In the current study, parents were asked to rate curriculum areas before ranking was conducted. Previous research on personal values (McCarty and Shrum 2000; Schwarz and Wyer 1985) has suggested that a rank-then-rate procedure may contribute to a greater differentiation of the ratings, compared to a simple rating method alone. It would be appropriate for future researchers to consider administrating the ranking prior to the rating procedure. Lastly, it would be valuable to conduct research on the factors parents consider in prioritising educational outcomes for their children.

Conclusion

This study investigated how parents of children with autism perceived the importance of friendship development as compared to other outcome priorities. It was

found that friendship, social and emotional developments were closely rated as the top three outcomes by parents, regardless of their children's educational placement or the level of their autistic severity. When parents were asked to rank priorities, however, social and emotional development was prioritised over friendship.

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Teacher Perception of the Importance of Friendship and Other Outcome Priorities in

Children with Autism Spectrum Disorder

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Abstract

This study investigated perceptions of teachers of children with autism spectrum disorder (ASD) on the importance of friendship development in comparison to other outcome priorities. Perceptions of teachers working in special classes were compared to those of teachers of mainstream classes. Friendship was rated of similar importance to social skills and emotional development, whereas intellectual and academic skills, physical skill and motor development, and creativity were rated of lower importance than friendship. When teachers were asked to force-rank priorities, friendship was third, preceded by emotional development and social skills. Special class teachers assigned higher ranks to learning outcomes that relate to the core deficits of ASD, namely social skills, friendship, and emotional development, as compared to mainstream class teachers. Furthermore, teachers prioritized friendship differently according to student levels of autistic symptomatology. When perceptions of teachers and parents were compared, both perceived social skills, emotional development, and friendship as the three most important outcomes. The implications of these findings for future educational service delivery are discussed.

Teacher perceptions of the importance of friendship and other outcome priorities in

students with autism spectrum disorder.

Friendship is a specific peer relationship characterized by a bond that is

voluntary and reciprocal, involving a degree of mutual affection and preference

(Freeman & Kasari, 1998). Friendship is associated with a greater degree of positivity

in interactions as compared to interactions with non-friends, specifically with regard to

positive engagement, effectiveness in task completion, and resolution of conflict

(Newcomb & Bagwell, 1995). The diagnosis of autism spectrum disorder (ASD)

involves an impairment in social skills, which often affects the ability to develop and

maintain meaningful friendship relations (Fuentes et al., 2012). Children with ASD

characteristically have fewer friends compared to their matched typical peers

(Bauminger & Shulman, 2003; Rowley et al., 2012) and a lower level of friendship

quality in areas of companionship, security-intimacy, closeness and help (Bauminger &

Kasari, 2000; Calder, Hill, & Pellicano, 2013; Solomon, Buaminger, & Rogers, 2011).

Teachers of students with ASD have the responsibility for assessment of each

student's needs, strengths, and weaknesses, to formulate appropriate curriculum to

address those needs, and to ensure successful learning. Identifying curriculum priorities

for children with ASD is a complex process, due to their diverse educational needs

(Humphrey & Parkinson, 2006). Previous researchers have suggested the use of

specialized curriculum elements that target areas of deficits specific to ASD (including

language, communication, social interaction and adaptive goals) as one of the

components of effective practice for children with ASD (National Autism Center, 2015;

Reichow, Doehring, Cicchetti, & Volkmar, 2010).

The need for the implementation of specialized curriculum adaptations in a

school setting requires that teachers understand the needs and learning characteristics of

children with ASD. This understanding of their student learning characteristics and educator perceptions of outcome priorities shapes their teaching approach and classroom behaviors (Trigwell, Prosser, & Waterhouse, 1999). Nevertheless, due to limited time and resources, teachers may prioritize some learning outcomes over others, and may emphasize particular areas of the curriculum that they perceive to be important. Mavropoulou and Padeliadu (2000) investigated how teachers perceived different curriculum priorities in children with ASD. They reported that special education teachers who have received specific training in ASD were more able to match curriculum priorities specific to student needs, as compared to mainstream class teachers, who tended to focus on broader areas of well-being. No other research has been identified examining teacher priorities for children with ASD.

There is a limited amount of literature regarding teaching friendship skills to children with ASD within school settings (e.g., Chang, Shih, & Kasari, 2016). As a result, teachers might feel unequipped in addressing the development of friendship skills in their students as a curriculum focus. It is possible that teachers implicitly recognize the need for improvement in student friendship skill, but might focus instead on other outcome priorities with better-defined teaching procedures (e.g., social skills, academic skills). Thus, it is of interest to see the extent to which teachers view friendship as an important priority.

There are a number of reasons for examining the degree of alignment between teacher and parent priorities. First, perceptions of teachers may differ from parent perceptions in regards to student behavioral problems and social functioning (Jepsen, Gray, & Taffe, 2012). This might influence how teachers and parents prioritize the different learning outcomes. The key role of parents in the planning and decision making process for individual programming for students with disabilities has been

recognized widely (Rioux, 2013) and is a legal requirement in several countries (e.g., Individuals with Disabilities Education Improvement Act, 2004 in the U.S.; Disability Standards for Education, 2005 in Australia). In Australia, where the majority of children with ASD are educated in mainstream school settings (Australian Bureau of Statistics [ABS], 2012), it is crucial for teachers and parents to align students' educational priorities. Second, the majority of interventions targeting socially related skills have generally been conducted in school environments (Bellini, Peters, Benner, & Hopf, 2007). Only a small number of those studies measured generalization effects, and researchers often reported the lack of generalization of learned social skills across trained and untrained contexts (e.g., home and community settings) (Reichow & Volkmar, 2010; Wang & Spillane, 2009). For that reason, a close collaboration between teachers and parents could therefore be a crucial component for newly learned social skills to be maintained and generalized successfully across multiple settings.

There appears to have been no research examining correspondence between teacher and parent curriculum priorities for children with ASD. However, in children with a range of other disabilities (learning disabilities; moderate, severe, and multiple disability), Baumgart, Filler, and Askvig (1991) found that parents rated the importance of social skills instruction significantly lower than either special education teachers or experts in special education. Furthermore, in typically developing children, Knudsen-Lindauer and Harris (1989) reported greater emphasis by parents on the development of intellectual skills than teachers within kindergarten curricula. Thus, in other groups there is evidence of discrepancy between parent and teacher priorities, but this issue does not appear to have been addressed in children with ASD.

Parental knowledge of their children's characteristics as learners may be valuable, especially in children with ASD, where symptomatology and capacities can

vary extensively across individual students. Active involvement of parents has been shown to be crucial, specifically in regards to the development of friendship-related behaviors (Frankel et al., 2010; Frankel & Whitham, 2011). It could be problematic when teacher priorities are misaligned with the needs of the child or in conflict with parent priorities. Given that parents may contribute to the educational planning and support instruction, the process of aligning the perceptions of both teachers and parents in outcome priorities for students with ASD might contribute to a coherent service delivery, which may enhance the students learning opportunities.

The aim of this study is to explore how teachers perceive the importance of friendship as compared to other learning priorities. Specifically, perceptions of teachers working in special classes will be compared to teachers of mainstream classes. In addition, teacher perceptions of the importance of friendship will be compared across students with severe autism and students with mild to moderate impairment. Finally, data from teachers will be compared with previous research examining parent priorities (Petrina, Carter, & Stephenson, 2015).

Method

The data used in this study were collected as part of a larger multiyear study ("Autism Educational Outcomes Study") examining the efficacy of two different models for education service delivery for students with ASD in Australia. The first model was a special class that involved the use of satellite classes as implemented in New South Wales (NSW) by Autism Spectrum Australia (Aspect). In this model, students were placed in a segregated special class within a regular school prior to a gradual transition into mainstream classrooms. The other model was a consultative support model as implemented in South Australian (SA) by Autism SA, where children were supported within regular mainstream classes from the point of school entry. The

satellite model in NSW was offered as an option to parents, who could also choose mainstream class placement. Only the data regarding perceptions of curriculum priorities will be addressed in this paper.

Participants

Participants were teachers of children currently enrolled in Kindergarten (Reception) to Year 3 with a formal diagnosis of Asperger's disorder or autistic disorder by a pediatrician or psychologist using DSM-IV diagnostic criteria and who were of normal intelligence or within the mild range of intellectual disability. There were 50 boys and 12 girls with a diagnosis of ASD in the age range of 6.9 to 11.2 years ($M = 9.40$, $SD = 1.10$) at the time of data collection, with a mean full scale IQ of 84.59 ($SD = 16.85$). Thirty of the students were enrolled in satellite classrooms, and the other 32 attended mainstream classrooms. A range of assessments was completed on participants, including the Wechsler Intelligence Scale for Children (WISC-IV; Wechsler, 2003), Vineland Adaptive Behavior Scales-II (VABS-II; Sparrow, Cicchetti, & Balla, 2005), and Social Responsiveness Scale (SRS; Constantino & Gruber, 2005). A summary of the children's characteristics is presented in Table 1.

Demographic information for the teacher participants is presented in Table 2. A total of 54 teachers contributed to the study, of whom 22 were satellite class teachers and 32 were mainstream class teachers. The 22 satellite teachers who agreed to participate in the study reported on 30 participating students in NSW. The mainstream class teachers each reported on one student. Sixteen of the teachers had completed university equivalent training in special education, and 17 more had received special education training through in-service modules. In addition, three of the NSW teachers reported having specific training in autism at a university level. The majority of these

teachers in NSW reported receiving on-going autism specific training specifically through Aspect.

Survey

Two approaches may be taken to establish curriculum priorities. Rating allows respondents to assign a weighting to each of the outcome priorities, but similar ratings may be given to more than one priority. Ranking forces respondents to differentiate and prioritize the importance of each outcome relative to others (McCarty & Shrum, 2000; Vanleeuwen & Mandabach, 2002). Furthermore, the process of ranking might provide the best reflection of outcome priorities in school settings that may be characterized by limitations in resources and time. That is, ranking might provide the best reflection of priorities when there are competing and difficult decisions regarding resource allocation to be made. In this study, teacher perceptions were investigated using a survey, which incorporates both rating and ranking.

The survey was designed specifically for the current study to examine teacher perceptions of the importance of six outcome priorities for their students. These were: (a) social skills (the ability to behave and interact with adults and peers in an age appropriate manner); (b) physical skill and motor development (the ability to perform age-appropriate physical activity involving both gross and fine motor skills in the child's muscular coordination); (c) intellectual & academic skills (the ability to form and understand concepts, problem solve, possess an age appropriate concentration level which is manifested in the child's ability to do well at the level set out by the child's school); (d) creativity (the ability to demonstrate the use of divergent thinking and imagination to generate original ideas); (e) emotional development (the ability to develop perception of self, their own emotions as well as the emotions of others); and (f) friendships (the ability to form and maintain reciprocal peer relationships). The

descriptors provided above formed part of the survey. The selection of outcome priorities was developed from the surveys used in previous research on parental priorities by Lim, Girl, & Quah (2000) and Pituch (2011).

Data collection procedures

The majority of the data were collected by trained research assistants through face-to-face interview, with the exception of two teachers who completed the survey through telephone interview. Prior to the interview, teachers were sent an information sheet containing the 5-point scale and the list of the outcome priorities and their descriptions. As the interviewer read out the instructions, followed by the priorities and their descriptions, teachers were asked to select their answers according to the scale presented on the information sheet. Each teacher had to complete one survey for each of his/her participating students. Teachers were also asked to provide demographic information about themselves, such as age, years of professional experience, and their highest level of education.

Data analysis

In the first part of the survey, teachers were asked to rate the importance of each outcome on a 5-point scale, ranging from 1 (*not at all important*) to 5 (*very important*) for each student participating. The mean score and standard deviation for the ratings of each outcome were then calculated to give indication of the level of importance that teacher placed on each individual outcome.

In the second part of the scale, teachers were asked to assign a rank to each outcome (e.g., 1 was assigned to the most important outcome and 6 was assigned to the outcome with the lowest importance). In reporting data on ranking, the numbers were reversed to maintain consistency with the reporting of the rating scale. Thus, higher values were always associated with higher rankings of importance.

Data from the current study was compared with parallel data collected from parents six months earlier (see Authors, 2015). Parents were asked to rate and rank the same curriculum priorities as teachers using the same procedures as the current survey. Comparisons were limited to the 55 children for whom data were available from both teachers and parents. Comparisons were made in two ways. First, overall differences were explored by examining the mean ratings and rankings for each group. Second, differences at an individual level were examined by deducting the scores of teacher's ranking from parent's ranking for the same student. Frequency distributions of differences were then plotted.

Results

Initially, it was of interest to determine whether there were differences in the priorities of teachers in satellite support classes and those who were in mainstream classes. Some of the satellite class teachers reported on multiple students: hence, data were not independent and inferential analysis was not conducted.

It can be seen from Figure 1 that teachers in satellite classes and in mainstream classes rated friendship as similar in importance to social skills and emotional development, and mean scores for all these areas were within a 0.25 range. Intellectual and academic skills, physical skill and motor development, and creativity were rated approximately a half point lower than friendship. When teachers were forced to rank areas in order of priority, friendship was third, preceded by emotional development and social skills for both groups of teachers. As seen in Figure 2, satellite teachers assigned higher ranks to learning outcomes that relate to the core deficits of ASD, namely social skills, friendship and emotional development as compared to mainstream teachers. Mainstream teachers rankings of intellectual and academic skills were considerably higher than that of satellite teachers (mean score difference = 0.89).

Teacher priorities for different outcomes were compared based on student level of autistic severity as measured by the Social Responsiveness Scale (SRS; Constantino & Gruber, 2005). As shown in Figure 3, all teachers, regardless of the severity of their students' autism, rated friendship, social skills, and emotional development as the top three outcome priorities. Teachers ranked friendship as the third priority behind social skills and emotional development for both students with mild to moderate autistic symptomatology and severe autistic symptomatology (see Figure 4). A large difference was observed in the ranking of intellectual and academic skills (mean score difference = 0.76) and friendship across the two groups (mean score difference = 0.70). Higher importance for intellectual and academic skills was reported for students with severe autistic symptomatology compared to those with mild to moderate level of autistic symptomatology. Friendship was ranked as more important in the group with mild to moderate levels of autistic symptomatology as compared to those with severe levels.

Teachers and parents reported similar patterns in their rating and ranking of the outcome priorities. Both teachers and parents rated and ranked social skills, emotional development and friendship as the three most important outcomes when compared to intellectual and academic skills, physical skill and motor development, and creativity (see Figures 5 and 6). Parents consistently rated all curriculum outcomes as more important in their children's development than did teachers. When forced to rank, friendship was ranked similarly across parents and teachers. Furthermore, parents ranked social skills and emotional development, and physical skill and motor development as lower priorities than teachers.

The agreement levels between teacher and parent rankings of outcome priorities are presented in Figure 7. Positive scores indicate that teachers viewed a particular outcome as more important than did parents. Conversely, negative scores indicate a

greater importance for a particular outcome as viewed by parents as compared to teachers. A score of 0 indicates that teachers and parents give the same importance to the rating or ranking of a particular outcome. Thus, the more closely clustered the graph is around a score of zero, the greater the degree of agreement between parents and teachers. The majority of the differences in rank were of one point in both positive and negative directions. There was a very high level of absolute agreement with regard to creativity and a high level of agreement for social and motor skills. Agreement on remaining curriculum priorities was lower and the lowest level of absolute agreement (i.e., scores of 0) was between teacher and parent perceptions of friendship.

Discussion

The goal of this study was to investigate teacher perceptions of the importance of friendship in relation to other outcome priorities in children of ASD with varying level of autistic symptomatology across satellite and mainstream classroom setting. In addition, where available, teacher views of the importance of friendship and other outcome priorities were compared to those of parents of the same children. The investigation of teacher perceptions was conducted using both rating and ranking approaches. In rating, teachers were able to assign a weighting to the importance of each outcome priority. Ranking, however, required teachers to prioritize and differentiate the relative importance of each outcome. Teachers rated all of the outcome priorities as highly important, but a greater differentiation of outcome priorities was seen when teachers were asked to rank the importance of the outcomes.

Overall, both mainstream teachers and satellite class teachers rated and ranked friendship, social skills, and emotional development as the top three most important outcome priorities. This may reflect recognition of the broad learning needs of children

with ASD in the area of social and emotional development as well as friendship, all of which may be seen as related to core socio-communicative deficits.

Teachers of satellite classed ranked friendship, social skills, and emotional development for students with ASD as more important compared to mainstream class teachers. It is possible that specialist satellite teachers had a greater depth of knowledge regarding core deficits of ASD, even though similar percentages of satellite and mainstream teachers reported having completed specific training in ASD. It should be noted that satellite class teachers were provided with extensive autism-specific systemic curriculum and pedagogical support structures from Aspect and a lower teacher to student ratio (typically a teacher and aide to 6-8 children). Given that social skills programming is likely to need to be individualized, satellite teachers might give it a higher priority as they have better support and resources to address socio-communicative need. Only 11% (5 out of 44) of children in the mainstream classroom received itinerant support, which ranged from 1.25 hours to 16.42 hours in one academic year, so the level of autism specific support was far more limited in this setting.

Mainstream students were more cognitively able (as reflected in the FSIQ) but had higher SRS scores, indicating greater severity of autistic symptomatology. Nevertheless, their teachers ranked intellectual and academic skills to be of greater importance than teachers in satellite classes. It is possible that this reflected a view that students in mainstream classes would benefit to a greater extent from a focus on academic instruction. This result might suggest that mainstream teachers' perception of their students' potential to progress in a certain area might influence the way they prioritize the importance of learning outcomes. Teachers might possibly have prioritized areas where students were more likely to be successful.

Friendship was ranked third by teachers from both satellite and mainstream classes behind emotional development and social skills. Despite its importance for children with ASD, friendship development and maintenance may not necessarily be seen as a focus of instruction. Fostering successful friendship relations requires the mastery of a complex set of skills (e.g., social cognition, language, emotions). Although it is possible that teachers may consider friendship as one aspect of the broader curriculum area of social skills, teaching of social skills may be necessary but not sufficient to facilitate friendships (Laugeson, Frankel, Mogil, & Dillon, 2009). Another possible reason that friendship was ranked lower than social skills and emotional development could be because friendship is a concept that is difficult to operationalize (Gifford-Smith & Brownell, 2003). There are limited intervention studies that target friendship as an outcome (e.g., Solomon, Goodlin-Jones, & Anders, 2004; MacKay, Knott, F., & Dunlop, 2007; Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008). As a result, teachers have limited guidance on how to facilitate friendships. This might cause teachers to feel less capable to target improvements in the area of making and keeping friends, and thus to make it a lower priority.

The curriculum priority areas (i.e., social skills, emotional development, and friendship) related to core socio-communicative deficits of children with ASD were rated and ranked higher for children with mild to moderate levels rather than those with severe level of autistic symptomatology, as measured by the SRS. This result is unexpected and counterintuitive, and we do not have an explanation other than that, as previously noted, in this sample, children showing higher levels of autistic symptomatology were in mainstream settings where teachers may have had less specific knowledge of ASD.

When examining central tendency, teachers and parents in this study similarly rated and ranked social skills, emotional development, and friendship as the three top learning outcomes, followed by intellectual and academic skills, physical skill and motor development and creativity. Comparison of mean rankings between the two group showed similar results to that of Baumgart et al. (1991), who found that parents rated the importance of social skills instruction slightly lower than either special education teachers or experts in special education. In regards to intellectual skills, parents reported greater emphasis on the development of academic and intellectual skills than teachers, which is consistent with previous study of typically developing children by Knudsen-Lindauer and Harris (1989).

The understanding of how each stakeholder views the importance of specific learning outcomes is a good starting point in the process of aligning priorities for a cohesive service delivery. Further analysis at the individual level, however, shows considerable variation in the level of agreement between the perceptions of teachers and parents with regards to ranking of learning outcomes. In terms of outcome of absolute agreement, friendship was ranked as one of the learning outcomes where teachers and parents had the least number of complete agreements ($n = 18\%$). In general, teachers ranked friendship skills to be of higher importance than parents. Teachers might be more likely to observe the child in social situations with a broader range of peers, necessitating behaviors pertaining to friendship skills. Hence they might be more aware of the need to prioritize friendship skills.

It has been previously noted that in the Australian context and internationally, it is mandated that parents play a key role to assist in the process of programming for personalized learning and support. When parents and teachers priorities are not clearly aligned, a number of issues could arise. The first one could be that parents often report

a low satisfaction in the service being provided because it does not fulfill their expectation of what needs to be targeted. Second, the lack of teacher-parent collaboration might jeopardise the effectiveness of the program implementation across school and home settings (Carter et al., 2014; Hurth et al., 1999), hindering the process of skill generalization.

Future Research

Further research is needed to replicate and extend the findings reported in this study. A comparison study of teachers and parents perception of the importance of friendship, using a larger and broader sample of parents and teachers of children with ASD is needed to extend the current preliminary data presented. This data will clarify further the level of congruency in perceptions between these two stakeholders. In addition to quantitative data, it would be beneficial to collect qualitative data on stakeholder perceptions of the importance of friendship and their reasons for their perceptions. Furthermore, it is of interest to investigate the relationship between teacher training and the depth of their knowledge in core deficits of ASD and how this impacts on the way they prioritize friendship skills in relation to other outcome priorities. It would also be valuable to examine the perceptions of students with regard to priorities.

Limitations

Several limitations of the present study should be noted. Samples of teachers and parents were recruited from schools across two states in Australia. Hence, the results of this particular study might not be reflective of broader teacher and parent perceptions. Furthermore, the data on the importance of friendship and other outcome priorities in the current study relied on teacher reports of their perceptions, and not on their actual practice. Finally, an unavoidable six-month time gap existed between the collection of parent data and teacher data. Nevertheless, the data collected was within

the same academic year, so a degree of consistency within perceptions would be expected.

Conclusion

This is the first study to compare the perception of teachers and parents on the importance of friendship and other learning outcomes in children with ASD. Three major conclusions arise from the results of this study. First, friendship was ranked as a less important outcome priority by both teachers and parents in comparison to social skills and emotional development. Second, satellite class teachers ranked the outcomes that relate to the core deficits of ASD as higher in priority as compared to the mainstream class teachers. This might indicate that in mainstream class, teachers might be less sensitive to the needs of students with ASD, hence as compared to satellite teachers, they rated intellectual and academic skills as higher priorities as compared to other areas of core deficits, namely social skills, friendship, and emotional development. Third, significant disparities in teacher and parent perception were observed, especially in the areas of friendship, emotional development, and intellectual and academic skills. This lack of alignment in perception of priorities can impact on the success of learning both in and outside of the school. This finding highlights the need for schools to examine the alignment of school and parent priorities in the development of educational programs.

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Table 1. Demographic characteristics of children with ASD

	Satellite (n = 30)	Mainstream (n = 32)
Girls : Boys	6 : 24	6 : 26
Age		
Mean (*SD*)	9.37 (1.07)	9.40 (1.14)
Range	3.99	4.18
Full Scale IQ (*SD*)	78.70 (16.64)	95.32 (11.51)
SRS Scores (Parents form)		
Total	76.17 (13.23)	83.63 (11.18)
Social Awareness	68.83 (11.23)	71.24 (11.24)
Social Cognition	73.33 (12.73)	81.09 (11.03)
Social Communication	73.13 (13.16)	78.33 (10.33)
Social Motivations	64.57 (14.30)	69.70 (11.44)
Autistic Mannerism	82.83 (16.70)	86.64 (13.40)
VABS Scores (Parents form)		
Communication	85.52 (11.20)	84.28 (11.74)
Socialisation	81.28 (10.80)	79.83 (13.67)
Adaptive behavior composite	80.03 (7.98)	80.83 (11.43)

Table 2. Demographic characteristics of teachers who completed the questionnaire

	Total (*SD*)	
	Satellite (*n* = 22)	Mainstream (*n* = 32)
Age		
25 or under	1	6
26-40	11	11
41-55	8	11
56 or older	2	4
Highest Educational Qualification		
Diploma	3	7
Bachelor	17	22
Master	2	3
Length of teaching experience (years)		
Mean	11.70 (10.01)	12.88 (10.67)
Range	39.5	35.5
Teachers with training in special education	15	12
Teachers with specific training in autism	19	20
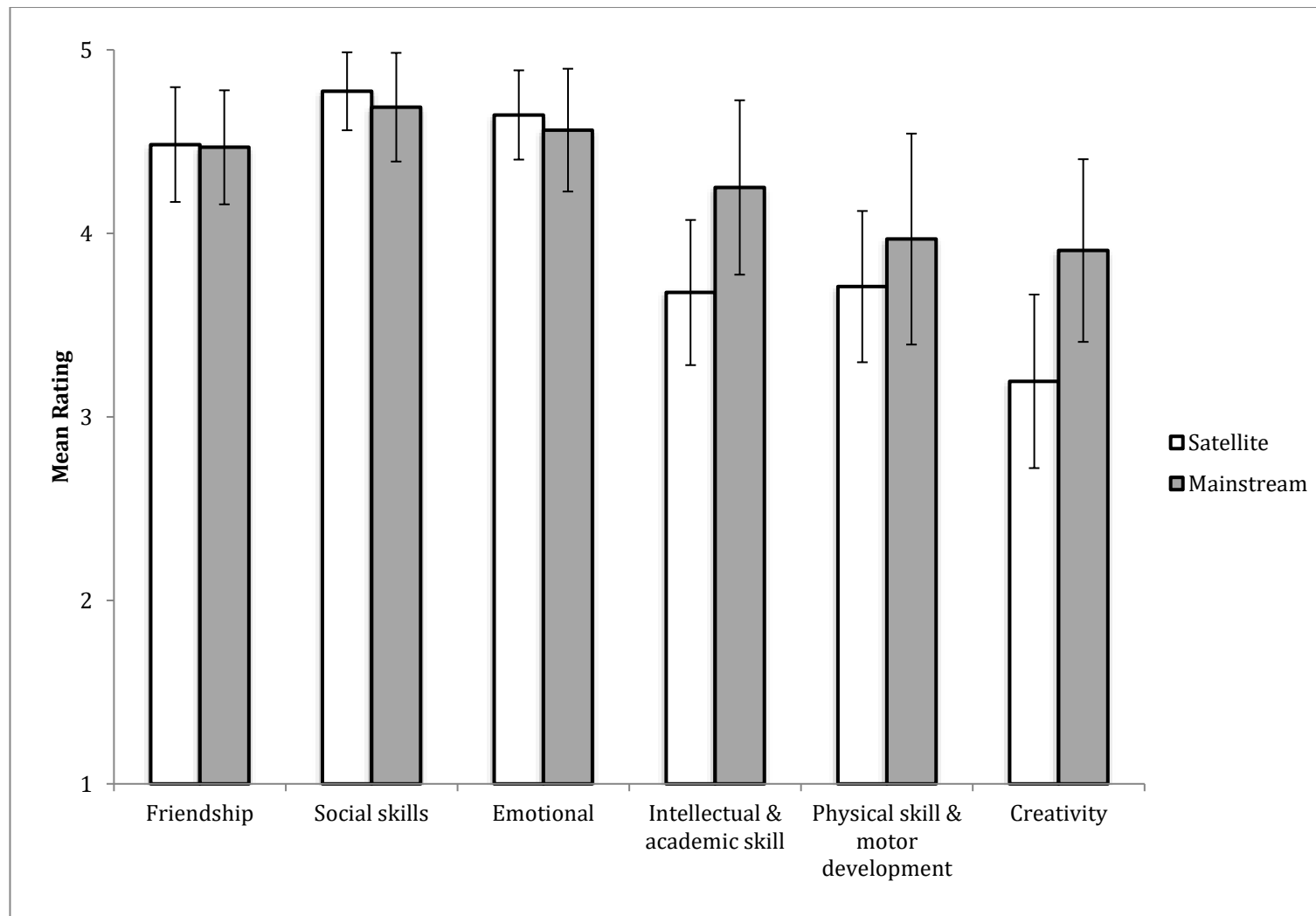
Figure 1. Mean ratings (and standard deviation errors) of importance reported by teacher
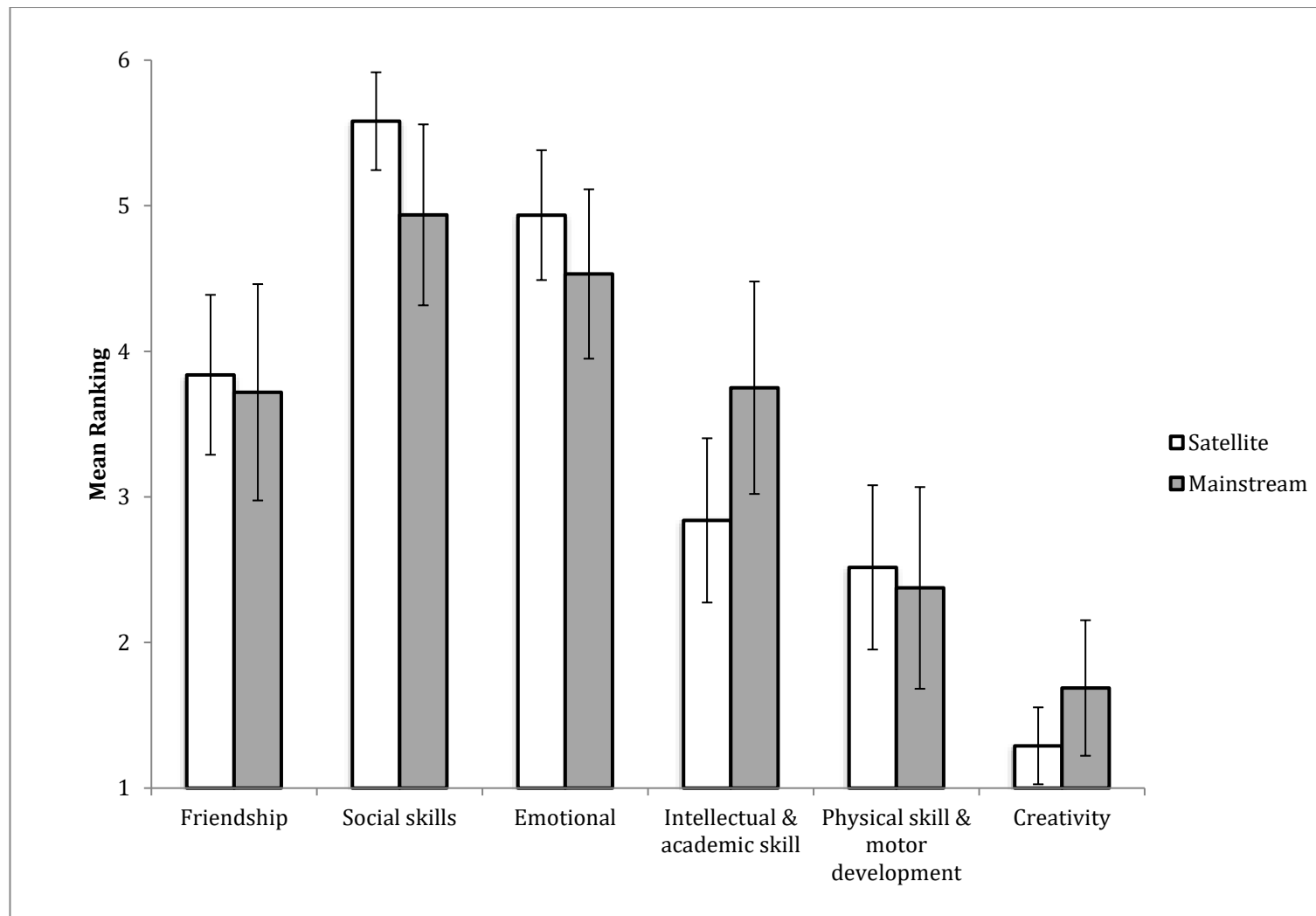
Figure 2. Mean rankings (and standard deviation errors) of importance reported by teachers
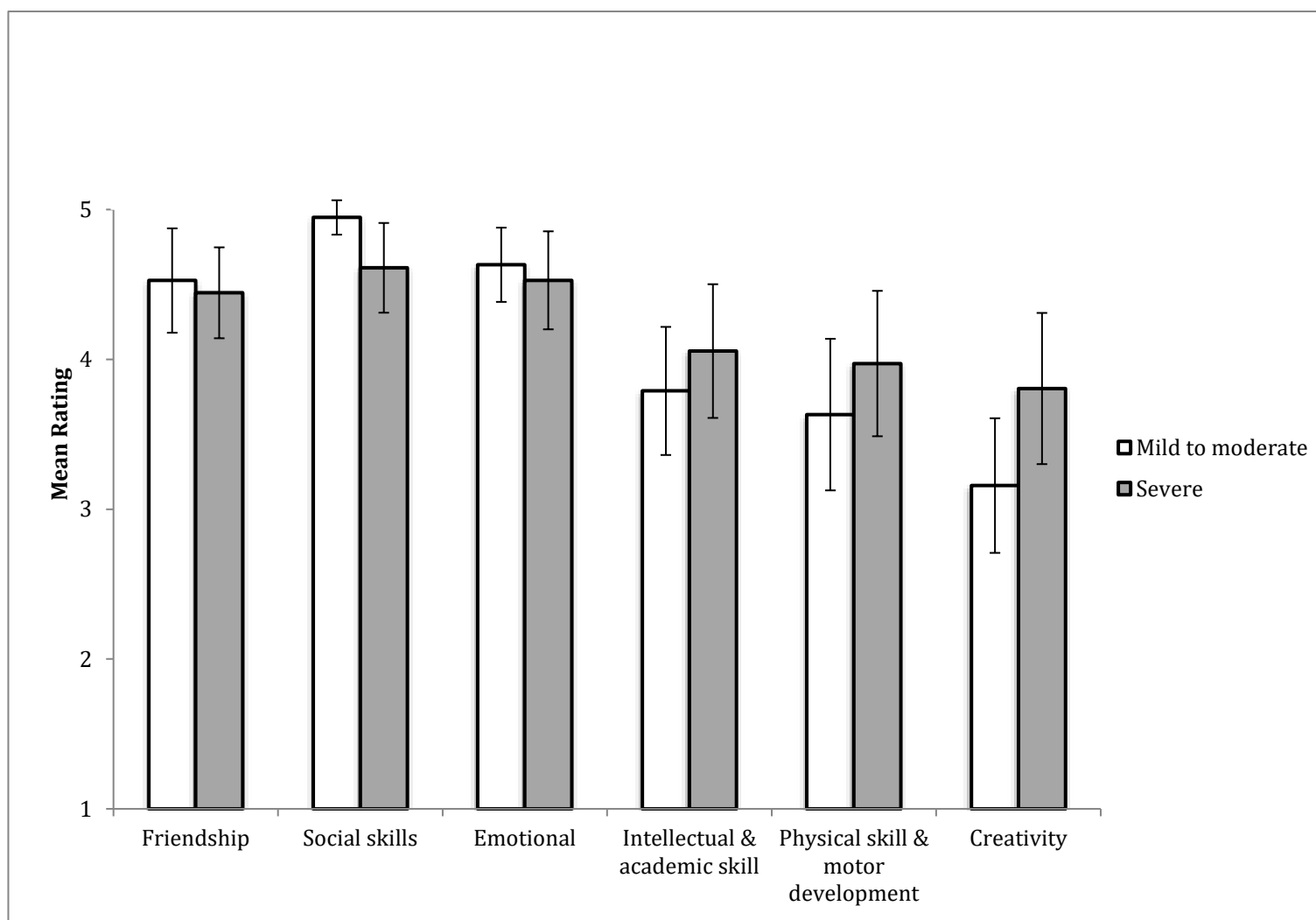
Figure 3. Teachers' ratings (and standard deviation errors) of curriculum priorities as grouped according to their student's level of autistic severity
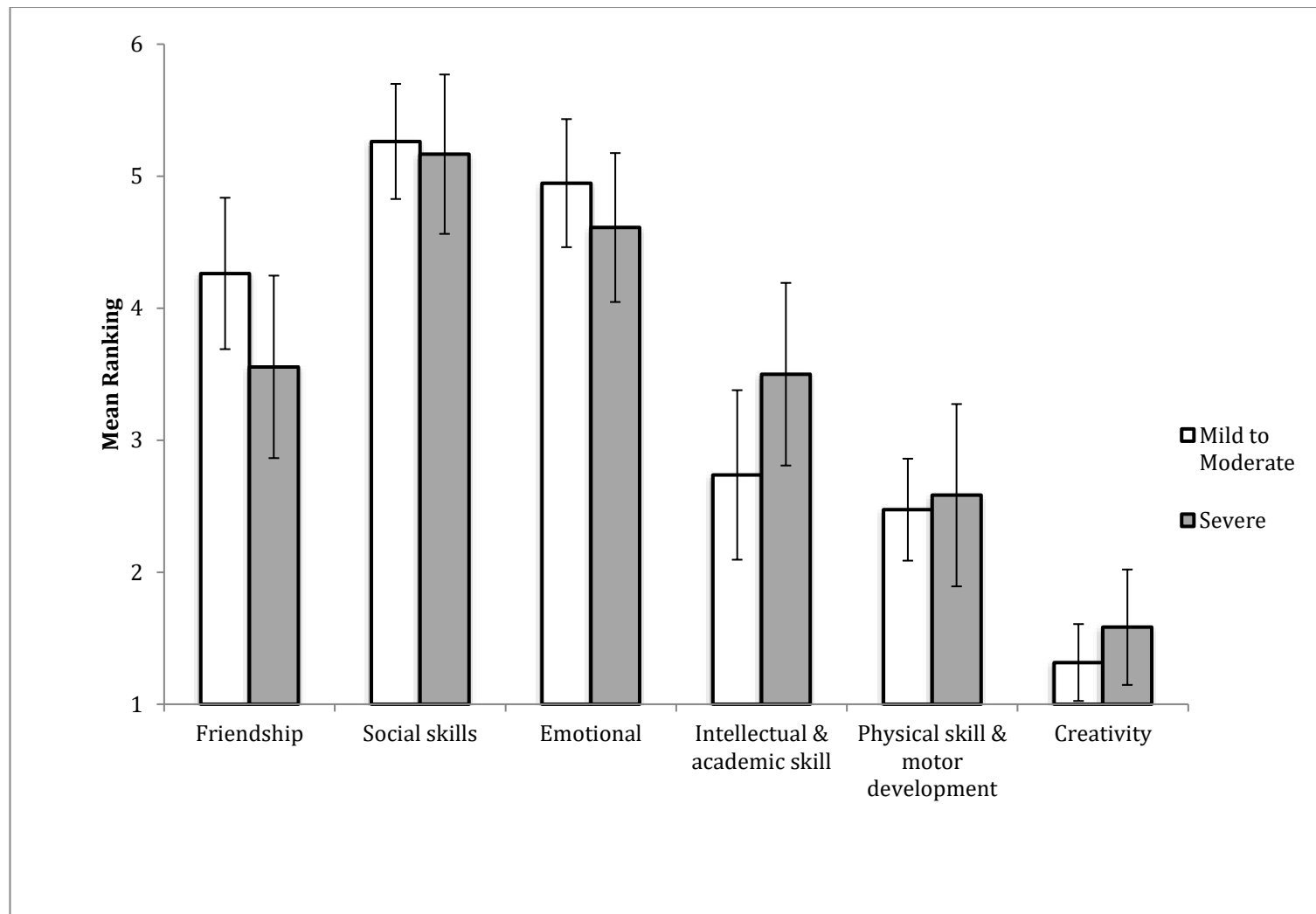
Figure 4. Teachers' rankings (and standard deviation errors) of curriculum priorities as grouped according to their student's level of autistic severity
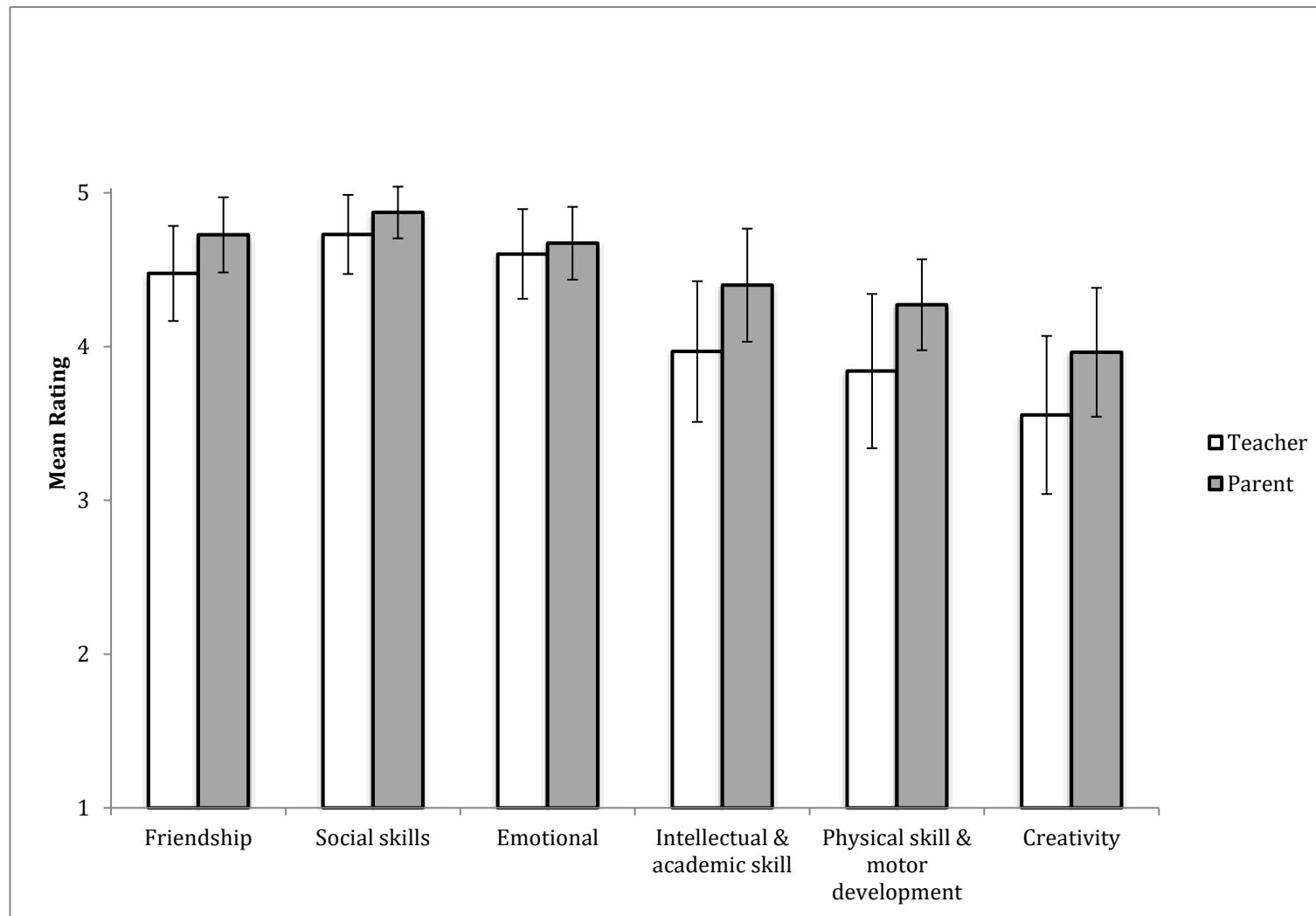
Figure 5. Mean ratings (and standard deviation errors) of importance across teachers and parents
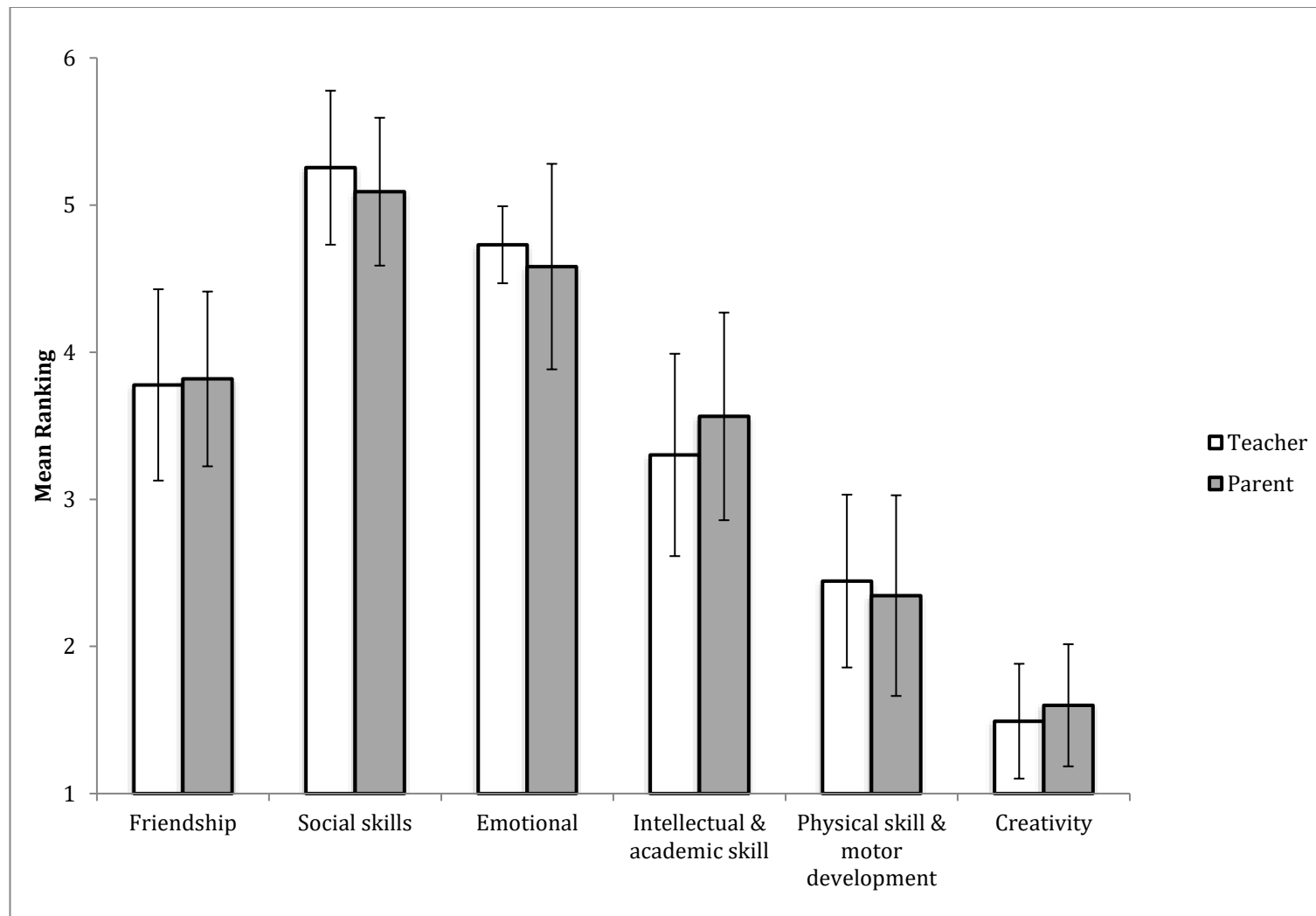
Figure 6. Mean rankings (and standard deviation errors) of importance across teachers and parents
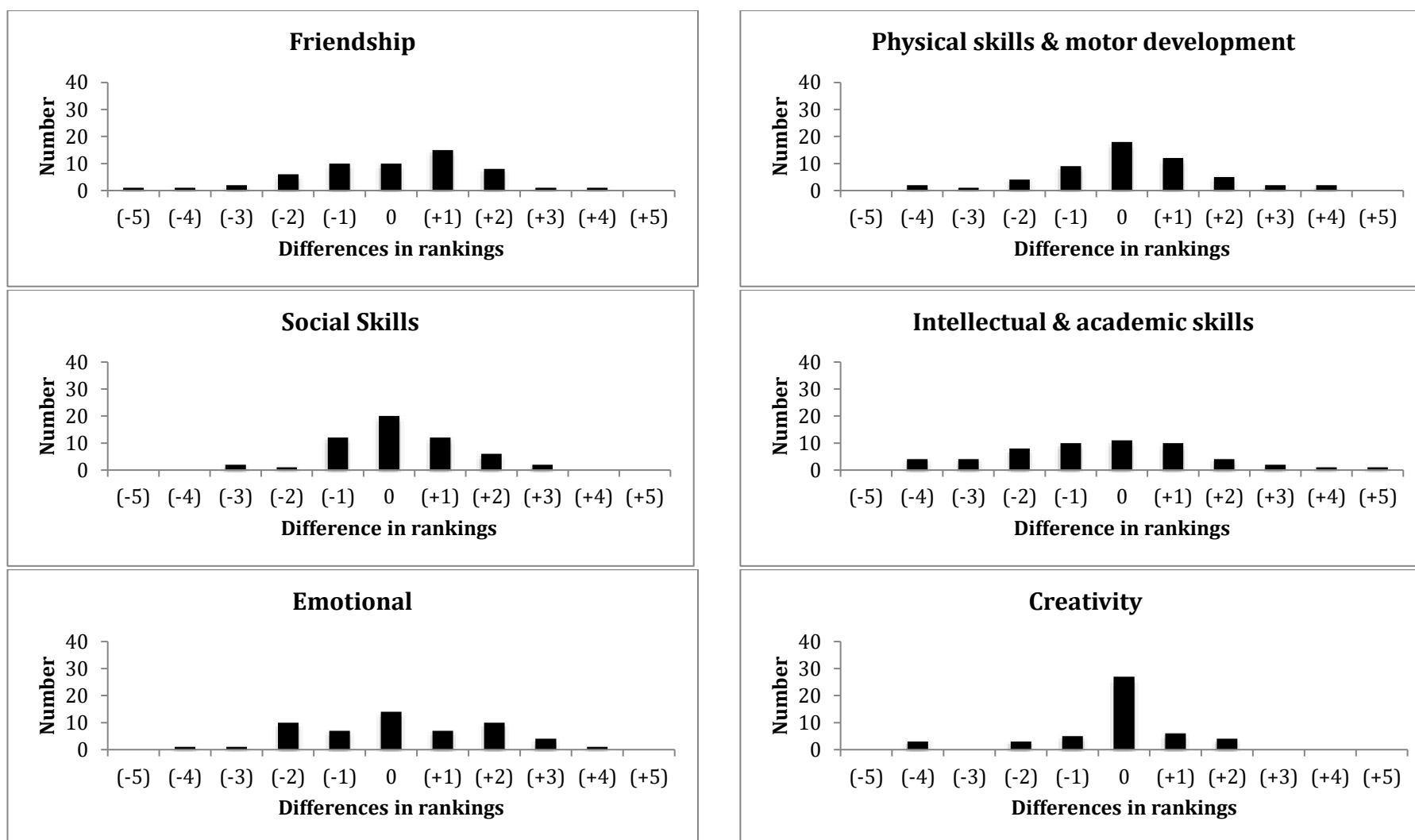
Figure 7. Scores of agreement in rankings of outcomes between teachers and parents

CHAPTER 6: CONCLUSION

Summary and Implications of the Current Research

The main aim of this research was to investigate friendship in children with ASD. Several questions were proposed regarding the differing pattern of friendship in children with ASD as compared to their nominated friends with and without diagnosis of ASD. Aspects of friendship were investigated from multiple perspectives, including those of the target children, their friends, parents and teachers. The research conducted in this thesis has contributed to the field of friendship research in children with ASD in a number of ways.

In chapter 1, background to the area of study was presented. Theoretical and conceptual issues were addressed. In addition, an overview of the thesis and the research questions were presented.

In chapter 2, a systematic review of the literature was reported, which provided an assessment of the current status of research on the nature of friendships in children with ASD. The following questions were addressed: (a) who are the participants, (b) what methodologies have been employed, and (c) what is our understanding of friendship in children with ASD? This examination of the literature suggested that friendships in children with ASD differ in their behavioral manifestations and quality as compared to friendships in typically developing children. Several gaps and methodological limitations of the extant research were identified, which could assist in the development of an agenda for future research. The present research addressed some of those gaps raised in the systematic review, namely by (a) conducting study with participants of broader range of age and autistic symptom severity and degree of intellectual impairment), (b) triangulating friendship nominations among multiple

sources, and (c) conducting comparisons of friendship perception between children with ASD and their nominated friends.

The reciprocal nature of friendship necessitates that the viewpoints of both dyad members be taken into consideration in order to gain a full understanding of the nature of friendship relations. Limited attention has been given within the field of friendship study to examining the perspectives of both members of a friendship dyad involving a child with ASD. For that reason, the research presented in Chapter 3 was designed to investigate the perception of friendship quality as reported by both members of a friendship dyad involving children with ASD and their nominated friends. The majority of the friendship nominations were reciprocated, but evidence was presented of the differing perceptions of friendship quality between the dyad partners. The research in chapter 3 made an original contribution to the literature by providing an investigation of the perception of friendship quality from both members of the dyad.

Previous researchers studying friendship relations have mainly investigated the difference of friendship manifestation and quality between children with ASD and typically developing children. Minimal attention has been paid to how these friendships fulfill individual needs and expectations: in other words, how satisfied children with ASD are with their current friendships. In chapter 4, the results of the first quantitative study were reported, investigating the level of friendship satisfaction in children with ASD and their nominated friends (with and without diagnosis of ASD). In addition, qualitative examination of the salient features of friendship that might be related to satisfaction, as perceived by children with ASD and their friends, was undertaken. The target children and their nominated friends typically reported relatively high levels of friendship satisfaction. At the individual dyad level, a high level of agreement on friendship satisfaction was observed. Thematic analysis of the qualitative data indicated

similarity in how children with ASD and their friends described features of their friendship. Shared interests and activities were reported most often, and intimate exchange was the theme least mentioned. Slight differences were observed across friends with and without ASD. Friends with ASD more often mentioned the aspect of practical support and help. On the other hand, friends without ASD more often mentioned aspects of friendship status and friendship quality in their description of friendship.

In chapter 5, two related studies examining the extent to which friendships are prioritised by parents and teachers as compared to other curriculum outcomes (e.g., intellectual and academic skills; social skills; physical skills and motor development; creativity; and emotional skills) and their level of agreement were reported. The perceived importance of friendship by parents and teachers of children with ASD across two different educational settings, a satellite support class model and mainstream class placement, were compared. No significant differences were observed in parental priorities between parents of children in mainstream classes and those in the satellite class model. Satellite teachers assigned higher ranks to learning outcomes that relate to the core deficits of ASD compared to mainstream teachers. Comparison between parent's and teacher's perceptions of priorities indicated that parents consistently rated all curriculum outcomes as more important in their children's development than did teachers. When forced to rank priorities, mean friendship ranking was similar across parents and teachers. Analysis on an individual level, however, suggested a lowest level of absolute agreement between teachers and parents ranking in the area of friendship. This research contributes to the very limited available data on curriculum priorities for children with ASD. In addition, the research provides some methodological extensions to extant research. Prior to this research, investigation of how parents and teachers

perceived the importance of friendship development has been solely conducted using a rating system. Rating allows parents and teachers to assign a more precise weighting to the importance of each outcome priority. However, it may not allow greater differentiation of the importance of each outcome (McCarty & Shrum, 2000; Vanleeuwen & Mandabach, 2002). As a result, both rating and ranking systems were utilised in the present research, giving a greater insight into how friendship development is prioritised.

Limitations and Future Direction of the Research

The limitations of each specific study have been addressed within the individual chapters. Only the broader issues arising from the program of research will be considered within this section of general discussion.

The approach taken for the present research was primarily quantitative, combined with some qualitative exploration in the analysis of friendship. There was an extensive reliance on report measures, where data on friendship were collected using combined methods of self-report, peer report, and parent and teacher report. It would be beneficial for future researchers to incorporate observational measures. Given that friendships involve sustained relationships, such measures are likely be difficult to conduct (Webster & Carter, 2010). Nevertheless, additional data from observational measures would give insight into the alignment between observable aspect of friendship relations and perspectives of status and quality of the friendship.

The analysis of friendship in the current research was cross sectional in design, where the nature of established friendship was the focus of interest. Reviews of previous studies have shown that friendship development across stages of relationship formation (specifically, initiation, maintenance and dissolution) have rarely been examined. Understandably, the investigation of friendship nature across different stages

of relationship formation would be challenging, and would require a well designed procedure for data collection. However, this knowledge is critical to the understanding of the mechanisms behind successful establishment of friendships and the circumstances that give rise to the success or failure of friendship relationships.

The current research has typically only looked at one best friend within a dyad relationship. Research with children and adolescents has provided evidence that participants often reported having more than one best friend (e.g., Gest, Graham-Bermann, & Hartup, 2001; Hartup, 1993; Sebanc, Kearns, Hernandez, & Galvin, 2007). Studying the nature of friendship relations through analysis of multiple best friendships could be a difficult task logistically. Nevertheless, it is possible that the quality of all these best friendships might have an effect on an individual's overall social development and contributes to their level of friendship satisfaction. Hence, data from multiple friends could be collected in future studies that investigate the nature of friendship in children with ASD.

Conclusion

In this chapter, the studies reported in this thesis have been summarised, and some general issues have been discussed. The limitations of the current research and suggestions for future research have also been addressed. The contributions that this research has made to the field of friendship research in children with ASD have been identified as follows: (a) presenting a summary of the current state of knowledge on the characteristics of friendship in children and adolescents with ASD, which could assist in the development of an agenda for future research; (b) an examination of the quality and satisfaction of friendship relations from both partners of the dyad; (c) the first investigation into the level of current friendship satisfaction, focusing on how these friendships fulfill individual needs and expectations; and (d) examination of how

parents and teachers prioritize the development of friendship skills as compared to other learning outcomes in children with ASD. The present study presents preliminary evidence as to how children with ASD and their friends perceive their current state of friendships. Thus, the outcomes presented in this research extend the current knowledge of friendship in children with ASD and may assist researchers and educators in their understanding of friendship development.

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Appendix A

Ethics Approval

MACQUARIE UNIVERSITY

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6 October 2011

A/Prof Mark Carter
Macquarie University Special Education Centre
Faculty of Human Sciences
MACQUARIE UNIVERSITY NSW 2109

Reference: 5201100729

Dear A/Prof Carter

FINAL APPROVAL

Title of project: *"The efficacy of models for educational service delivery for students with Autism Spectrum Disorders"*

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

The following personnel are authorised to conduct this research:

A/Prof Mark Carter – Chief Investigator
A/Prof Jennifer Stephenson, A/Prof Katrina Williams, Dr Debra Costley, Dr Trevor Clark and Mr Jon Martin – Co Investigators

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL LETTER TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on **6 October 2012**.

    If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

    Progress reports and Final Reports are available at the following website:

    http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

www.mq.edu.au

ABN 90 952 801 237 | CRICOS Provider No 00002J

3.   If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4.   All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5.   Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6.   At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

http://www.mq.edu.au/policy/

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this letter as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this letter.

Please retain a copy of this letter as this is your official notification of final ethics approval.

Yours sincerely

Dr Karolyn White
Director of Research Ethics
Chair, Ethics Review Committee (Human Research)

Parental Perception Scale

_____

1. How important are these outcomes for your child's development?

	Not at all important	Not very important	Neutral	Quite important	Very important
Social skills *(the ability to behave and interact with adults and peers in an age appropriate manner)*					
Physical skill & motor development *(the ability to perform age-appropriate physical activity involving both gross and fine motor skills in the child's muscular coordination)*					
Intellectual & academic skills *(the ability to form and understand concepts, problem solve, possess an age appropriate concentration level which is manifested in the child's ability to do well at the level set out by the child's school)*					
Creativity *(the ability to demonstrate the use of divergent thinking and imagination to generate original ideas)*					
Emotional *(the ability to develop perception of self, their own emotions as well as the emotions of others)*					
Friendship *(the ability to form and maintain reciprocal peer relationships)*					

2. In relation to your child's development – Rank the importance of these outcomes to you from 1 to 6. The outcome that is most important to you should be ranked 1, and the outcome that is least important should be ranked 6 (1 = most important to 6 = least important).

Social skills	
Physical skill & motor development	
Intellectual & academic skills	

Creativity	
Emotional	
Friendship	

		Not true	Sometimes true	Always true	Don't know
1	I think my child's friendships at school are going well				
2	I think my child feels happy when he/she is with friends at school				
3	I think my child would like to have more friends at school				
4	I think my child has good friends at school				
5	I think my child would like to have different friends at school				
6	I think my child is happy with his/her friendships at school				