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THE POWER OF FRIENDSHIPS: ASSOCIATIONS BETWEEN FRIENDSHIP
QUALITY, SATISFACTION, AND WELL-BEING FOR CHILDREN WITH AUTISM
SPECTRUM DISORDER

A Dissertation Presented
by
MELANIE S. FELDMAN

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2021

Clinical Psychology Program

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ABSTRACT

THE POWER OF FRIENDSHIPS: ASSOCIATIONS BETWEEN FRIENDSHIP QUALITY, SATISFACTION, AND WELL-BEING FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

August 2021

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Children with autism spectrum disorder (ASD) exhibit characteristic deficits in the social domain, which can interfere with their ability to form and maintain high quality relationships with their peers. Indeed, children with ASD are generally regarded as having lower quality friendships than typically developing (TD) children. However, based on a small emerging literature, children with ASD, despite reporting having lower quality friendships, indicate that they are satisfied with their friendships at similar levels to their TD peers. This apparent discrepancy between friendship quality and satisfaction for children with ASD as compared to TD children suggests that another factor may account for why satisfaction is still high in spite of lower quality friendships. Namely, friendship expectations (i.e., personal perceptions about the characteristics friends should possess and behaviors they should engage in) may differ between children with and without ASD, and these expectations may moderate the association between children's ratings of quality and satisfaction.

Understanding these patterns of relations among dimensions of friendship is critical to providing children with ASD with effective interventions as may be needed to support their social development. The current study investigated the associations between friendship expectations, quality, and satisfaction in middle childhood with a sample of 58 children, comprised of 22 children with ASD and 36 TD children. Contrary to past research, results of the current study indicated that children with ASD were less satisfied with their friendships than TD children. Further, children with ASD demonstrated a stronger association between friendship quality and friendship satisfaction than TD children. Friendship expectations did not moderate associations between friendship quality and friendship satisfaction for children with ASD. Additionally, this study explored the association between children's friendship quality and satisfaction with indicators of children's overall well-being (global self-worth and quality of life) and found that children with ASD evidenced stronger associations between both friendship quality and friendship satisfaction with quality of life. Clinical implications are discussed.

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I share this achievement with my family. All that I have learned about high quality relationships started at home. I could not have asked for a better support system.

As this dissertation is a study on friendships, it feels essential to acknowledge the friends who helped me to achieve this milestone. I am deeply indebted to my longtime friend Carly Coleman, who took time out of her incredibly busy schedule to design and co-illustrate ten drawings that were an essential component of my friendship expectations measure. I am also thankful for my friends from the UMass Boston Clinical Psychology Program, especially Ivy Giserman Kiss and Rachel Rubin, who offered both practical advice and humor when the time called for it.

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CHAPTER 1

SPECIFIC AIMS

Children with autism spectrum disorder (ASD) exhibit characteristic deficits in the social domain, which can interfere with their ability to form and maintain high quality relationships with their peers (American Psychiatric Association, 2013). Indeed, children with ASD are generally regarded as having lower quality friendships than typically developing (TD) children based on self-report measures that assess multiple domains of quality including companionship, conflict, help, security, and closeness (Petrina, Carter, & Stephenson, 2014). For TD children, greater friendship quality is associated with higher friendship satisfaction (Ladd, Kochenderfer, & Coleman, 1996; Parker & Asher, 1993); however, based on a small emerging literature, children with ASD, despite reporting having lower quality friendships, indicate that they are satisfied with their friendships at similar levels to their TD peers (Calder, Hill, & Pellicano, 2013; Petrina, Carter, Stephenson, & Sweller, 2017). This apparent discrepancy between friendship quality and satisfaction for children with ASD as compared to TD children suggests that another factor may account for why satisfaction is still high in spite of lower quality. Namely, friendship expectations (i.e., personal perceptions about the characteristics friends should possess and behaviors they should engage in; Hall, 2011) may differ between children with and without ASD, and these expectations may moderate the association between children's ratings of quality and

satisfaction. The domains of friendship quality assessed by standard measurement tools (i.e., companionship, conflict, help, security, and closeness) were selected based on the normative expectations and assumptions about what constitutes quality among typically developing children, and may not accurately represent the importance that children with ASD place on their friendships. To the extent that expectations for friendships differ between children with versus without ASD, the degree to which friendship quality predicts satisfaction may also differ. To date, there is little research on the friendship expectations of children with ASD.

Ensuring accuracy in the ratings children with ASD make about their perceptions of their friendships is important, as the self-perceived quality of friendships is predictive of a wide variety of developmental outcomes among TD children, including social competence (Vandell & Hembree, 1994), self-worth (Maunder & Monks, 2018), and overall quality of life (Goswami, 2012). If perceived friendship quality is only weakly associated with friendship satisfaction in an ASD population, this raises the question of which aspect of friendship -- quality or satisfaction -- is more strongly related to children's overall well-being. Understanding these patterns of relations among dimensions of friendship is critical to providing children with ASD with effective interventions as may be needed to support their social development. The current study aimed to investigate the associations between friendship expectations, quality, and satisfaction with a sample of children with ASD and a comparison sample of TD children in middle childhood. Although some mean level differences between TD and ASD children were anticipated (i.e., children who are TD may have higher ratings on friendship quality and satisfaction relative to children with ASD), primary analyses focused on the comparison of the relative strength of relations between these variables across the ASD and TD samples. Additionally, this study explored the

relation between children's friendship quality and satisfaction with indicators of children's overall well-being.

Aim 1: To evaluate whether the association between friendship quality and friendship satisfaction is moderated by diagnostic status (TD/ASD).

Hypothesis 1a: The associations between the friendship quality total score and satisfaction score will be weaker among children with ASD than TD children.

Hypothesis 1b: The associations between friendship quality Conflict, Help, and Closeness domain scores (but not companionship and security domain scores) and satisfaction will be weaker among children with ASD than TD children.

Aim 2: To evaluate which of the individual domains of friendship quality (companionship, conflict, help, security, and closeness) are most closely associated with friendship satisfaction among children with ASD and a comparison sample of TD children.

Hypothesis 2a: Associations among TD children will replicate previous findings by showing that all quality domains are significantly associated with friendship satisfaction. On the other hand, for children with ASD, ratings of quality within the domains of companionship and security will contribute a greater amount of variance to friendship satisfaction than ratings of quality in the conflict, help, and closeness

domains; therefore only companionship and security are likely to be significant in the model.

Hypothesis 2b: For children with ASD, the association between individual domains of friendship quality and friendship satisfaction will be moderated by children's expectations regarding the extent to which friendships should contain features of that domain (i.e., the relative importance they place on that domain compared to the other domains of friendship quality). The strength of the association between friendship quality and satisfaction will be stronger when children hold greater expectations in that domain. This will be tested for each of the five domain scores and their corresponding expectation domain score.

Aim 3: To explore the relative contribution of ratings of both the total and domain scores of friendship quality and friendship satisfaction to the well-being of children with ASD and a comparison sample of TD children.

Hypothesis 3: ASD status will moderate the associations between friendship quality, friendship satisfaction and well-being, such that for the ASD group, friendship quality will be a lesser predictor of well-being and satisfaction will be a stronger predictor of well-being, as compared to the TD group.

CHAPTER 2

BACKGROUND AND SIGNIFICANCE

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects approximately 1 in 54 children and is characterized by deficits in social communication and social interactions, and the presence of restrictive and repetitive behaviors and interests (American Psychiatric Association, 2013; Maenner et al., 2020). Within the social domain, some of the possible symptomatic difficulties faced by children with ASD include reduced initiating and response to social interactions, difficulties engaging in back and forth social interactions, limited understanding and use of verbal and nonverbal communication, reduced or atypical interest in peers, and difficulties adjusting their behavior across social contexts, all of which can make it challenging for children with ASD to form and maintain high quality, satisfying friendships with their peers. Additionally, the restrictive and repetitive behaviors exhibited by children with ASD can include repetitive motor mannerisms, vocalizations, or use of objects, an insistence on certain patterns or routines, highly fixated interests in certain objects or activities, or hyper or hypo-sensitivity to certain sensory stimuli (APA, 2013). These interests or behaviors can be a source of joy or comfort to some children with ASD, although they may also interfere with the social interactions of some children with ASD, potentially increasing difficulties children face in developing relationships with their peers. In fact, associations have been reported between ASD symptom severity (both the

social-communication deficits and the severity of restricted and repetitive behaviors) and negative peer interactions, connectedness, and relationships (Hsiao, Tseng, Huang, & Gau, 2013; Jones, Pickles, & Lord, 2017; Locke, Williams, Shih, & Kasari, 2017; Rowley et al., 2012).

The social challenges faced by children with ASD have been well examined in the existing literature. Compared to typically developing (TD) children, children with ASD are less well integrated into their classroom social networks (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011), spend more time in solitary play on the playground (Dean, Harwood, & Kasari, 2017), and have fewer reciprocated friendships (Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). Notably, while these types of social challenges may be partly attributable to the social and behavioral profile of ASD, the negative behaviors of peers, including the disproportionately frequent victimization and bullying of children with ASD are also likely accountable for their poor social outcomes (Cappadocia, Weiss, & Pepler, 2012; Rowley et al., 2012). There is a well-developed literature exploring the friendship quality of children with ASD, with the majority of findings supporting that children with ASD have lower quality friendships with peers compared to TD children according to standard measurement tools (see Petrina et al., 2014 for a review). However, within these bodies of existing research, there is a dearth of research on the perceptions of children with ASD with regards to what they expect and require out of a friendship to feel satisfied with the relationship.

For TD children, friendship quality and friendship satisfaction are highly associated with one another. The limited research in this area indicates that friendship quality accounts for 31% to 46% of the variance in satisfaction; the individual domains of friendship quality,

which vary by study but contain similar features such as validation, help, and conflict, are all individually associated with friendship satisfaction ($rs = .24 - .52, p < .03$) (Ladd et al., 1996; Parker & Asher, 1993). While friendship quality and satisfaction have not been directly examined together in an ASD sample, the emerging literature on the friendships of children with ASD indicates that despite indicators of low-quality friendships, children with ASD report feeling satisfied by their relationships (Calder et al., 2013; Petrina et al., 2017). This pattern suggests that associations between traditional markers of friendship quality and friendship satisfaction may be weaker for children with ASD versus those without ASD. The current study aimed to explore this question by examining the association between friendship quality and satisfaction in both an ASD and TD population.

A critical aspect of friendships that is related to both friendship quality and satisfaction is the expectations that a child holds about friendships. For TD individuals, friendships that regularly fulfill expectations are considered more satisfying; adults who rate their daily interactions with a friend as meeting or exceeding their expectations in the domains of positivity, support, openness, and interaction, report greater friendship satisfaction in their relationship with that same friend (Hall, Larson, & Watts, 2011). The most commonly used measures of friendship quality among both TD children and children with ASD are child-report measures that were developed based on the characteristics of TD friendships (Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993). Thus, it logically follows that these measures would be strong predictors of friendship satisfaction for TD children. However, expectations for friendships may vary across individuals, and compared to TD children, little is known about what children with ASD expect from their friends and what aspects of friendship they value most highly or consider most important, with only two

studies examining their friendship expectations to date (Bottema-Beutel, Malloy, Cuda, Kim, & MacEvoy, 2019; Malloy, Cuda, Kim, & Bottema-Beutel, 2020). It may be that children with ASD do not similarly expect or value all of the same aspects of friendship (e.g., companionship, help, intimacy) as TD children; this assertion is supported by qualitative interviews in which children with ASD most frequently discuss companionship as the central element to a friendship, referring to other domains of friendship less frequently (Bauminger & Kasari, 2000; Calder et al., 2013; Carrington, Templeton, & Papinczak, 2003). The current study explored the role of friendship expectations as a moderator of the relationship between the domains of friendship quality and their ratings of friendship satisfaction.

Beyond providing social satisfaction, friendships play an important developmental role in children's lives. Having high quality friendships predicts a wide variety of developmental outcomes for TD children including the development of social competence (Vandell & Hembree, 1994), positive self-worth (Maunder & Monks, 2018), and overall quality of life (Goswami, 2012). For children with ASD, for whom friendship quality and satisfaction may be less strongly associated, it is unclear whether friendship quality or satisfaction is more strongly associated with children's well-being. Given the importance of developing a positive sense of self for children with ASD, understanding whether friendship quality or satisfaction is more strongly associated with positive outcomes can provide a useful tool for determining whether and when social interventions could be implemented to support children with ASD. For instance, if the friendships of a child with ASD are determined to be low quality, traditionally, social skills or peer-based intervention may be suggested to help 'improve' the quality of their friendships; however, if that child reports that they are satisfied by their 'low quality' friendships and there are no adverse effects on their

well-being, intervention may in fact not be warranted nor particularly beneficial. Therefore, this study explored the relation between children's friendship quality and self-reported satisfaction with multiple indicators of children's overall well-being to determine which indicator of friendship has the strongest predictive value.

There are currently several significant gaps in the existing literature of the friendships of children with ASD. For one, many of the studies in this area similarly suffer from small sample sizes, which limits generalizability and occasionally results in divergences between study findings that are difficult to make sense of. In addition, outside of the construct of friendship quality, friendship variables have only been explored in a small handful of studies for children with ASD. In particular, we know very little about the friendship expectations of children with ASD, the associations between friendship quality and friendship satisfaction, and the associations between quality, satisfaction, and the overall well-being of children with ASD. This dissertation study contributes to the existing literature by gathering information from both TD children and children with ASD on their friendship expectations, quality, and satisfaction, such that the associations between these variables can be directly compared across populations. Additionally, both children and their parents reported on measures of positive development to test the strength of the association between indicators of friendship and children's well-being.

Characteristics of Friendships

Friendship is one type of peer relationship that is distinct from other types of peer relationships, including relationships with acquaintances and interactions within larger peer groups (Ladd, 1999). Friendships are voluntary, dyadic relationships that are characterized first and foremost by mutual liking (Bukowski, Motzoi, & Meyer, 2009). These

relationships have both positive and negative features, such that friendships can be supportive but also include conflicts (Berndt, 2004). Although there is no single definition of friendship, one comprehensive description is that friendships are characterized by “stable, frequent, and interconnected affective interactions that are manifested by certain classes of behavioral markers (e.g., sharing, play and conversational skills) that facilitate the functions of companionship, intimacy, and closeness” (Bauminger et al., 2008, p. 136). In this definition, friendship is noted to be composed of two specific components, an interactive element (i.e., the behavior markers occurring between two individuals) and the fulfillment of important functions (i.e., friendship quality), with friendship quality contingent on the interpersonal behavioral patterns of the relationship.

The central elements of friendships are considered culturally universal, including mutuality and reciprocal exchanges, although there are cultural variations in how much relative value individuals place on one aspect of friendship over another (e.g., emotional versus instrumental support) (Adams & Kurtiş, 2015; Borner, Gayes, & Hall, 2015). While these most central elements of friendships are likely to apply to children with ASD, there is a lack of research on the perceptions of children with ASD on friendships; this gap in the research leaves open the possibility that children with ASD may also exhibit variations in their beliefs about friendships. For instance, children with ASD may hold divergent beliefs from TD children regarding the importance of different forms of interaction (e.g., spending time together, sharing secrets) to their friendships, and may also derive differential amounts of value from these interactions than TD children. If children with ASD hold qualitatively different views about the nature and function of friendship from their TD peers, then it may

be necessary to reevaluate how the characteristics of friendships are conceptualized and operationalized for this population.

Friendships are generally determined to be ‘successful’ based on their self-rated quality and associations with positive personal and academic outcomes. The benefits of high-quality friendships based on the TD literature are numerous and include promoting school liking and perceptions of peer support (Ladd et al., 1996), positive academic adjustment (Wentzel, Barry, & Caldwell, 2004), protecting against loneliness (Lodder, Scholte, Goossens, & Verhagen, 2017), and the development of positive self-worth (Maunder & Monks, 2018) and overall quality of life (Goswami, 2012). Compared to the research on TD children, we know relatively little about the short- and long-term effects of friendships for children with ASD. It has been established that children with ASD can have friendships that are sustained over long periods of time and that they find personally rewarding (Bauminger et al., 2008). However, their relationships are generally less stable (i.e., shorter in duration) than those of their TD peers regardless of whether the friendship is with another child with ASD or a TD child (Bauminger & Shulman, 2003; Rowley et al., 2012). Despite these difficulties, a majority of children with ASD and their friends (both ASD and TD) report feeling satisfied in their friendships (Petrina et al., 2017). Less is known about how either positive or negative friendship experiences of children with ASD impact their overall well-being.

Friendship Quality

Friendship quality can be defined as a child’s appraisal of the various qualitative features of their friendship (Ladd et al., 1996). A high quality friendship is one marked by a high level of positive features, such as prosocial behaviors, and low levels of negative

features, such as conflict (Berndt, 2002). In the context of research, the construct of friendship quality is frequently assessed dimensionally, as children endorse the extent to which their friendship contains select positive or negative features across multiple domains (Hartup, 1996). Traditional self-report assessments of friendship quality in children with ASD have consistently indicated that these children have lower quality friendships than their TD peers (see Petrina et al., 2014 for a review). However, the friendship quality differences between children with ASD and TD children should be considered in light of the fact that the use of standardized measures may have a downward bias for children with ASD relative to children without ASD. In quantitative studies, friendship quality in children is typically measured utilizing one of two self-report Likert-scale measures in which children are asked to report on their relationship with a friend. The first, the *Friendship Quality Questionnaire (FQQ)*, consists of six subscales: companionship and recreation, help and guidance, validation and caring, intimate exchange, conflict and betrayal, and conflict resolution (Parker & Asher, 1993). The second, the *Friendship Qualities Scale (FQS)*, comprises five domains of friendships: companionship, conflict, help, security, and closeness (Bukowski et al., 1994). These two measures capture overlapping friendship features and are used frequently in the literature on TD children's friendships and those of children with ASD. These measures were developed based on the extant literature of TD children to capture the central features of children's friendships. Because these measures were developed based on the literature of friendships among TD children, it is not clear that these measures would capture the full range of potential behaviors children with ASD consider to be important to their friendships, yet they are frequently used for children with ASD and their TD peers (Petrina et al., 2014). The main drawback of using these measures for children with ASD is

that they are based on the defining features of friendships for TD children and may not be an accurate determinant of the meaningful features of friendship as appraised by children with ASD.

A recent systematic review of friendships of children with ASD found that one of the two above mentioned measures was utilized in each of the ten included studies that measured friendship quality, with nine of the ten utilizing the FQS (Petrina et al., 2014). Based on these studies, children with ASD are consistently lower in their ratings of companionship, help, security, and closeness compared to their TD peers, with inconsistent and nonsignificant differences in ratings of conflict across studies (Petrina et al., 2014). Thus, while multiple sets of findings are highly consistent in indicating that children with ASD have lower quality friendships than TD children in terms of the positive aspects of friendship, this assertion has been derived from a comparison to quality standards based on TD children's experiences and is therefore inherently predisposed to favor TD children. It is still possible that children with ASD do, in fact, have less companionship, help, security, and closeness in their relationships, however, it has not been ensured that this difference amounts to a lower quality friendship, as appraised by children with ASD.

While there is no friendship quality measure designed for children with ASD, one self-report measure was developed to assess friendships for adults with ASD. The Friendships Questionnaire (*FQ*), measures the extent to which individuals on the autism spectrum “enjoy close, empathic, supportive, caring friendships that are important to them; that they like and are interested in people; and that they enjoy interacting with others for its own sake” (Baron-Cohen & Wheelwright, 2003, p. 509). This measure is not a direct assessment of friendship quality, capturing components of social motivation, empathy, and

friendship expectations. Despite its wider scope, the measure has been utilized to assess the ‘quality’ of friendships for people with ASD. Head and colleagues (2014) utilized a modified version of the FQ to assess friendship quality in adolescents with and without ASD, although internal consistency of the measure in their sample was weak ($\alpha = .61$); therefore, this tool did not appear to be measuring a unitary construct reliably in this sample. Their findings were consistent with those utilizing the FQQ or FQS, such that children and adolescents with ASD aged 10-16 had lower quality friendships than TD children. However, the FQ, while designed for individuals with ASD, bases its assessment on constructs drawn from research within the TD population, similar to the FQS and FQQ, rather than determining which features individuals with ASD value in their friendships.

While most researchers have been inclined to use and trust the results of the FQQ or FQS for young children with ASD, one concern frequently cited in the literature is the lack of reciprocal information from the friends of children with ASD to confirm ratings of friendship quality. One study examined reciprocal ratings of friendship quality for children with ASD using the FQQ and found high rates of reciprocity agreeing the friendship exists (89%), although less agreement in their ratings of qualities of friendship, particularly conflict resolution and intimate exchange (Petrina, Carter, Stephenson, & Sweller, 2016). Although disagreement might be considered problematic, friendship quality is a personal determination and may genuinely differ based on personal perceptions (Hiatt, Laursen, Mooney, & Rubin, 2015). Indeed, TD adolescents’ perception of friendship as low quality is associated with greater feelings of loneliness, even if their friend rates the relationship as high quality (Lodder et al., 2017). Therefore, for children with ASD who are likely less attuned to their friends’ experience than a TD child, reciprocal ratings of quality may not be a key indicator

of perceptions of quality or satisfaction with the relationship. Instead, accurate measurement of the appraised quality of friendship should be established by convergence with expected outcomes, for example, high quality friendships should result in greater friendship satisfaction than lower quality friendships.

Friendship Satisfaction

Friendship quality has been a frequently studied topic, with the use of common assessment tools aiding in comparisons across samples. In contrast, there has been less study of friendship satisfaction in both the TD and ASD populations, particularly as to how friendship quality relates to perceived relationship satisfaction. Whereas friendship quality is a personal appraisal of the features of the friendship, friendship satisfaction is more broadly an appraisal of the affective experience of one's relationship. Satisfaction is not contingent upon the presence of any particular friendship features, or lack thereof, rather satisfaction is a subjective determination that a friendship is providing the individual some benefit or value such as happiness. Based on the limited research in the TD population, ratings of friendship quality and satisfaction seem to be well aligned. TD children who rate their friendships as higher in quality report greater friendship satisfaction; children's self-reported friendship quality in the individual domains of validation, companionship, help, intimate exchange, and conflict are each moderately to strongly associated with friendship satisfaction, although the authors of this study chose not to examine or report beta weights of the friendship domains in a regression due to the multicollinearity of the domains (Parker & Asher, 1993). In another study of TD children utilizing a different measure of friendship quality, all five domains of friendship quality (validation, aid, conflict, exclusiveness, disclosing negative affect) were correlated with friendship satisfaction, however, only three domains (validation,

exclusiveness, conflict) uniquely contributed to friendship satisfaction (Ladd et al., 1996). In this second study, it is possible that issues related to multicollinearity of the variables (e.g., correlation between validation and aid $r = .47, p < .001$) may have suppressed the remaining two quality domain variables. For TD children, it appears that domains of friendship quality are strongly interrelated with one another and with friendship satisfaction. Therefore, higher quality friendships, based on operationalized definitions and assessments of quality, are expected to offer greater satisfaction to the participants in that friendship.

Based on the majority of the existing friendship quality research that demonstrates children with ASD have lower quality relationships, it would be expected that their satisfaction would be lower than their TD peers as well. However, while no study to date has specifically examined the associations between quality and satisfaction for children with and without ASD, there is evidence to suggest that there are weaker associations between existing quality indicators and friendship satisfaction for children with ASD compared to those without ASD. This pattern of findings suggests that the friendship features that are commonly measured to quantify friendship quality may not be as relevant for children with ASD based upon their friendship satisfaction in the apparent absence of traditional markers of quality. This evidence derives primarily from the only two known studies on the friendship satisfaction of children with ASD, both of which indicated that the majority of children with ASD are satisfied with their friendships (Calder et al., 2013; Petrina et al., 2017).

In the study by Calder et al. (2013), which utilized the FQS, twelve children with ASD aged 9-11 years reported their friendships as less close and helpful than their TD peers, but rated them as similarly marked by companionship, conflict, and security. In qualitative

interviews with the same children with ASD, all but one child reported being satisfied with their friendships. Therefore, having lower quality relationships according to the existing operationalization of quality did not appear to affect the overall satisfaction children derived from their friendships. There are a few possible explanations for this discrepancy. First, it may be the case that children with ASD do not highly value the qualities of closeness and helpfulness and therefore they were satisfied despite lower scores in those two domains. Second, children with ASD may be more easily satisfied by lower quality friendships. It could be the case that children with ASD have fewer expectations they need fulfilled within their friendships than TD children and thus most children with ASD would report high satisfaction regardless of the features present or absent from their friendship. These possibilities were explored in the current study as well as the potentially moderating role of children's friendship expectations on the association between the domains of friendship quality and satisfaction.

The second study by Petrina and colleagues (2017) examined the friendship satisfaction of 77 children aged 5-10 with ASD and their nominated friends, some of whom had ASD and some of whom did not. Children with ASD and their friends (both TD and ASD) reported similarly high levels of friendship satisfaction across five survey items. In this study, all satisfaction items were assessed on a three-point scale of never, sometimes, always, with the majority of children rating that they are sometimes or always satisfied. This study provides an important addition to the literature by demonstrating the similarity in satisfaction in ASD and TD populations. This study also provides further evidence that existing quality markers may not effectively capture the experiences of children with ASD who are similarly satisfied with their relationships as their peers. However, this study does not explore what

factors, such as friendship quality, might have predicted children's level of satisfaction; the variability in satisfaction could be dependent on quality, such that low-quality friendships provide satisfaction inconsistently compared to higher quality friendships. As this study did not explore associations with friendship characteristics or quality, it does not help to clarify questions surrounding the predictors of children's friendship satisfaction.

The results of these two studies (Calder et al. 2013; Petrina et al., 2017) suggest that the associations between quality and satisfaction of friendships found among TD children in middle childhood may not be as strong for children with ASD. However, given the limited sample sizes of these studies (fewer than 100 children in all) it is not known how well these results generalize to the broader population of children with ASD. If these satisfaction findings can be replicated, it would suggest that existing operationalized measures of friendship quality, which were developed to reflect the central features of the friendships of TD children, may not accurately capture the perceived central features of friendships for children with ASD. As friendships that more closely replicate the ideal or expected manner in which individuals interact with one another are associated with greater relationship satisfaction among TD children (Demir & Orthel, 2011; Fehr & Harasymchuk, 2017), the association between friendship quality and satisfaction for children with ASD may be dependent upon their friendship expectations.

Friendship Expectations

Understanding variation in children's expectations of friendships may be key to making sense of why children with ASD seem to have a weaker link between traditional assessments of friendship quality and perceived friendship satisfaction. There is a paucity of research that specifically examines the friendship expectations of children with ASD.

Friendship expectations are personal perceptions about the characteristics that friends should possess and behaviors in which they should engage (Hall, 2011; Hall et al., 2011). For TD adults, relationships that meet expectations on a daily manner provide greater relationship satisfaction (Hall et al., 2011). Supposing that the friendship features assessed to determine friendship quality are consistent with the friendship expectations of TD children, the same association between expectation fulfillment and satisfaction is likely true for TD children, for whom the presence of the central features of friendship (i.e., high friendship quality) is associated with greater friendship satisfaction. Thus, if children with ASD hold different expectations than their TD peers, it would logically follow that scores on a measure of friendship quality - which would not be properly aligned with the expectations of children with ASD - would not show a similar positive association with satisfaction for children with ASD as TD children. Instead, the friendship satisfaction of children with ASD would be dependent upon the fulfillment of their unique set of expectations.

The friendship expectations of children with ASD have been examined primarily in qualitative research that examines how children understand the concept and experiences of their friendships (e.g., Bauminger & Kasari, 2000; Calder et al., 2013; Carrington et al., 2003). While these qualitative interviews did not necessarily inquire about children's friendship expectations, children's responses to open ended prompts such as "What is a friend?" and the topics which they spontaneously discussed were explored to extrapolate upon their underlying friendship expectations; in support of this use of the data, there is evidence that the manner in which children with and without ASD define the characteristics of friendships is generally consistent with their friendship expectations (Malloy et al., 2020). Only one study has examined the friendship expectations of children with ASD and TD

children in a quantitative manner (Bottema-Beutel et al., 2019). That study separately examined both children with ASD and TD children who were in the 3rd through 5th grades, and assessed children's endorsement of friendship expectations across various domains as well as associations between expectations and children's self-reports of loneliness, friendship quality (using the FQS), and self-worth (Bottema-Beutel et al., 2019). Both the qualitative studies and the one quantitative study were utilized in the following review of the friendship expectations of children with ASD. In the current study, five broad domains of friendship features were examined based on those established by the FQS: companionship, conflict, help, security, and closeness (Bukowski et al., 1994). While the FQS domains were derived from a comprehensive literature review to capture the central features of children's friendships and not based upon expectations, the current study sought to align expectations with the assessed features of friendships to allow for a clearer examination of the associations between these two constructs.

Companionship. Children with ASD report companionship, sharing company, and engaging in activities together as key parts of their friendships (Calder et al., 2013; Carrington et al., 2003; Malloy et al., 2020). When asked to define friendship, children with ASD most frequently include companionship as compared to more affective or intimate domains of friendships (Bauminger & Kasari, 2000). This emphasis on companionship (often to the exclusion of other friendship qualities) is apparent throughout childhood and adolescence as even adolescents with high functioning ASD primarily describe friendships as long-lasting relationships featuring shared interests and activities (Carrington et al., 2003). Therefore, companionship was considered likely to be an expectation that carries over similarly from the TD to ASD population and is considered of great importance.

Conflict. Conflict is one dimension of friendship that seems to similarly affect the friendships of all children (Petrina et al., 2014). Children with ASD experience high rates of conflict and generally have greater difficulty both identifying and managing conflicts within their friendships as compared to children without ASD (Rowley et al., 2012; Sedgewick, Hill, Yates, Pickering, & Pellicano, 2016; Vine Foggo & Webster, 2017). When asked to describe a friendship, children with ASD frequently mention that friendships should lack conflict (Petrina et al., 2017), and they also consider unkindness, disagreements, and acts of social or physical aggression to be a transgression upon their friendship (Malloy et al., 2020). However, it may also be the case that children with ASD may not hold strong expectations around conflict as they are less apt to notice conflicts in their relationships or label them as problematic (e.g., Sedgewick et al., 2016), or because they are often the target of bullying or negative peer interactions (Rowley et al., 2012) they may be less likely to expect friendships to be free of conflict. Thus, the evidence in this domain is less clear as to what extent conflict-related expectations are held by children with ASD.

Help. This domain captures aspects of help-giving related to both practical help as well as protection from victimization. The expectation that friends will provide practical support is inconsistently endorsed by children with ASD. In one study in which children described their friendships in an open-ended format, a minority of children with ASD (approximately 20%) spoke of practical help or support, although they notably mentioned help more than children without ASD (Petrina et al., 2017). On the other hand, the only known study to quantitatively examine the friendship expectations of children with ASD found that help giving was among the most highly rated friendship expectation (Bottema-Beutel et al., 2019). In the quantitative study, children were asked to respond to friendship

expectations and endorse how often friends should engage in those behaviors. It is possible that children were thus more apt to consider and endorse the expectation that friends be helpful when prompted rather than when asked about their expectations without specific prompts; this explanation is supported by a second study conducted with the same group of children, which examined expectations qualitatively in an open-ended format in which only four of the twenty children with ASD reported help-related expectations (Malloy et al., 2020). Due to the conflicting evidence from studies with small samples, it is not yet clear to what extent help-related expectations are held by children with ASD.

Security. The expectation for security in a friendship encapsulates both the idea that friends can be trusted and relied upon and that the friendship can withstand a conflict or problem. Adolescents with ASD have described trust as an important quality in friendships (Murphy, Burns, & Kilbey, 2017; Vine Foggo & Webster, 2017). For some adolescents with ASD, negative experiences with peers in the past can make it more difficult for them to trust and open up to friends (Cook, Ogden, & Winstone, 2016). Therefore, children with ASD may learn to particularly value trust as a component of their friendships. Indeed it appears that children do hold similar expectations as the older adolescents, in the same quantitative study in which children highly endorsed help-giving as a friendship expectation, children with ASD also indicated that reliability and trust are important expectations that should be met regularly (Bottema-Beutel et al., 2019). Given the priority placed on trusting relationships by children and adolescents with ASD, security may be a strongly held expectation for children with ASD.

Closeness. The most affective components of friendships are included in the domain of closeness, including positive feelings towards one's friends as well as positive feelings

that the friend has for the child. The friendships of children with ASD are often considered to be less intimate than TD friendships. This perception is partly due to how children with ASD spontaneously define friendship as compared to TD children; children with ASD are less likely to mention the affective or intimate components of friendship as compared to companionship (Bauminger & Kasari, 2000). The lack of closeness has also been observed in the social interactions of children with ASD with their friends. For instance, children with ASD engage in limited social conversation and friendly overtures such as sharing positive affect with their friends (Bauminger et al., 2008). These findings suggest that children with ASD may not focus their efforts or expectations on some of the affective or intimate functions of friendship indicating that closeness is unlikely to be highly related to overall friendship satisfaction. In contrast, children with ASD have reported that they expect friends to be frequently kind and caring when prompted to respond to a question asking how often friends should engage in those types of behaviors (Bottema-Beutel et al., 2019). It may be the case that children with ASD are reminded of the importance they place on closeness by the use of a specific prompt, or they may be responding in an ‘ideal’ manner as they are aware that closeness is something that *should* be well incorporated into friendships, rather than indicating a specific desire for closeness with their friends. Prior negative peer experiences may have also resulted in children with ASD learning that friends are not always very kind, resulting in lesser expectations for a close and caring friendship. Considering all of the evidence, closeness was not expected to be a highly valued friendship expectation for children with ASD.

Overall, the literature on the friendships of children with ASD has indicated that their perceptions were either incomplete or more simplistic than that of TD children based on their

responses to open-ended prompts discussing their friendships (e.g., Bauminger & Kasari, 2000, Calder et al., 2013). These studies emphasized that children with ASD prioritized companionship above all other domains of friendship (e.g., Calder et al., 2013). However, as reviewed in this section, more recent research has supported that children with ASD maintain similar expectations compared to TD children when responding to specific item prompts about how often friends should act in certain ways (Bottema-Beutel et al., 2019). A limitation that is consistent throughout this area of research that further complicates integrating past research is the limited sample sizes of these studies, which may be contributing to inconsistency among findings. Thus, there is a need for further research to clarify the friendship expectations of children with ASD.

The current study aimed to clarify the friendship expectations of children with ASD by having children force-rank friendship expectations to determine a priority ranking for the importance of different friendship expectations. Additionally, friendship expectations were examined as a moderator of the association between friendship quality and satisfaction to test the hypothesis that quality would be more strongly associated with satisfaction if children indicate that they hold greater expectations for their friends in that domain. It has already been established that there is a positive association between children's friendship expectations and reports of friendship quality such that children with ASD who report higher expectations have higher quality friendships (Bottema-Beutel et al., 2019). Given that children with ASD may differentially value or expect the various domains of friendship, it would make sense that not all domains would equally contribute to satisfaction, and that the domains for which children hold high expectations would also contribute more to friendship satisfaction. Based upon the consistency of the extant literature, I hypothesized that children

with ASD would hold greater expectations in the domains of companionship and security than the domains of conflict, help, and closeness. I further hypothesized that children's appraisal of their friendship quality in the domains of companionship and security (i.e., their report of the presence of the features of companionship and security in their relationships) would be more strongly associated with friendship satisfaction than their appraisal of the other domains of friendship quality.

Children's Well-Being

The concept of child well-being is very broad, referring to both subjective and objective qualities of life, spanning across psychological, physical, and social domains, and can include the many possible dimensions of a good or bad life (Ben-Arieh, Casas, Frønes, & Korbin, 2014; Pollard & Lee, 2003). The current study examined two indicators of well-being in children: psychosocial quality of life and self-worth, which were chosen as aspects of well-being that were likely to be sensitive to the influence of relationships. Friendships serve an important role in the lives of young children, particularly with regard to their social and emotional development (Hartup, 1996). Positive relationships with friends can bolster positive attributes within a child while negative friendship experiences can put children at-risk for negative outcomes. For instance, among TD adults, high quality friendships are associated with greater friendship satisfaction which in turn is associated with greater self-esteem; on the other hand, friendships containing negative relationship patterns can lead to self-doubt, anxiety or depression over time (Bagwell et al., 2005). Similar findings have been found among TD children, whereby high quality friendships predict greater feelings of self-worth (Maunder & Monks, 2018) and overall quality of life (Goswami, 2012). For children with autism, for whom friendship quality and satisfaction may be less well aligned, it is

unclear if friendship quality will contribute similarly as friendship satisfaction to children's well-being.

Across multiple studies, children with ASD report having lower quality of life than TD children and children with other developmental or health-related difficulties (Begeer et al., 2017; Chiang & Wineman, 2014; Ikeda, Hinckson, & Krägeloh, 2014; Lee, Harrington, Louie, & Newschaffer, 2008; Tavernor, Barron, Rodgers, & Mcconachie, 2013). Less explored is the potential role that high quality and/or satisfying friendships play in bolstering quality of life for these individuals. For adults with ASD, greater perceptions of social support, social functioning, or social outcomes are associated with higher quality of life (Bishop-Fitzpatrick, Smith DaWalt, Greenberg, & Mailick, 2017; Moss, Mandy, & Howlin, 2017; Tobin, Drager, & Richardson, 2014). Similarly for individuals across the lifespan who are diagnosed with intellectual and developmental disabilities, greater friendship satisfaction is associated with higher quality of life (Friedman & Rizzolo, 2018). Although these associations are less well studied in children, one study of children with ASD has identified social impairment as negatively related to quality of life (Kuhlthau et al., 2010). However, there has not been any direct examination of the role of friendships in determining the quality of life for children with ASD. Based on the existing research, it is likely that children with ASD who perceive their friendships to be satisfying, regardless of their reported friendship quality, are likely to have higher quality of life.

Consistent with findings for quality of life, children and adolescents with ASD report having lower self-worth compared to TD children (Bottema-Beutel et al., 2019; Williamson, Craig, & Slinger, 2008). However, there is inconsistency between studies of the contribution of friendship quality to self-worth for children and adolescents with autism. One study of a

small group (n=16) of children and adolescents (ages 8-17) with ASD found that the FQS friendship quality domains of companionship, closeness and security were associated with children's positive self-perceptions (Bauminger, Shulman, & Agam, 2004). However, in the same study mentioned in the previous section that examined the friendship expectation of a small group (n=20) of children with ASD, associations between friendship expectations, quality, and self-worth were examined and results supported an association between friendship expectations and friendship quality, but neither expectations nor friendship quality were associated with perceived self-worth (Bottema-Beutel et al., 2019). In this study, friendship quality measured with the FQS was examined at the total score level rather than at the domain level; it is possible that individual domains of the FQS might be more predictive of perceptions of self-worth than the combined score, especially if intercorrelations between FQS domains are low for children with ASD. Based on this small body of literature, which is comprised of studies with small sample sizes, the role of friendship quality as a predictor of self-worth in children with ASD is still unclear. Moreover, to date, friendship satisfaction has not been examined as a predictor of self-worth for children with ASD. Therefore, the current study examined the associations of both friendship quality and friendship satisfaction with self-worth to help clarify how friendship experiences are related to a child's perceptions of themselves.

Further research is needed to elucidate the role that both children's friendship quality and friendship satisfaction serve in predicting children's well-being. Considering the possibility of weak associations between ratings of friendship quality and self-reported friendship satisfaction, it is possible that friendship quality (as it is currently assessed) is not consistently predicting well-being because it is not consistent with children's perceptions of

the friendship as fulfilling their expectations and providing satisfaction. For TD children, perceptions of their friendship as low quality and unsatisfying is associated with loneliness even if their friend's perception of the friendship is more positive (Lodder et al., 2017). For children with ASD, it may similarly be the case that their perception of their friendship as satisfying may be predictive of well-being even if their relationship doesn't contain the features that are supposed to indicate a high quality friendship. Therefore, the current study explored the associations between both friendship quality and friendship satisfaction with two indicators of children's well-being: self-worth and quality of life.

The Current Study

The last two decades have seen a sharp increase in the number of studies exploring the friendships of children with ASD, however, there is still much to be explored. The current study aimed to build upon previous research by examining the friendship expectations, quality, and satisfaction of children with ASD and TD children in a single study to allow for a fuller understanding of children's perceptions of their friendships. In doing so, it was possible to explore the direct and indirect associations between these variables in both populations in order to empirically determine whether these friendship constructs function similarly for children with ASD as TD children. Further, this study directly contributes to the limited body of research examining the effects of the friendships of children with ASD on their well-being by assessing both their quality of life and perceived self-worth. Specifically, this study: (1) evaluates whether the association between friendship quality and friendship satisfaction is moderated by diagnostic status (TD/ASD), (2) evaluates which of the individual domains of friendship quality (companionship, conflict, help, security, and closeness) are most closely associated with friendship satisfaction for each group and

examines the potential moderating role of friendship expectations, and (3) explores the relative contribution of ratings of both the total and domain scores of friendship quality and friendship satisfaction to the well-being of children with ASD and a comparison sample of TD children.

CHAPTER 3

RESEARCH METHODS AND DESIGN

Procedure

Data collection occurred between June 2019 and April 2020. The procedures of this study were adjusted due to the Covid-19 pandemic, and as such the two procedures utilized for in person (June 2019 – February 2020) and online assessments (which were offered after the onset of Covid-19 related quarantining began in March of 2020) are presented here.

Recruitment and Scheduling. Families were recruited through a variety of methods, including online and print advertisements that were distributed to local regional centers, intervention service centers, clinicians, local school districts, as well as parent support groups and websites. Interested families were informed of the purpose and logistics of the study and offered the opportunity to schedule an assessment.

In Person Assessments. Data collection sessions were conducted in person for the first 41 children enrolled who comprised 71% of the final sample. (73% of ASD group; 69% of TD group). In person assessments were held either at the family's home, a community location such as a library, or the Integrated Sciences center at the University of Massachusetts Boston based upon the family's preference. The assessor first reviewed the informed consent document with the caregiver. Following parent consent, child assent was obtained in writing. Based upon the child's preference, their caregiver either remained in the

room or waited in a nearby room while the child completed their questionnaires. The researcher provided verbal instructions to participants for each measure. Children were given the option to read assessment items independently or have the examiner read out all items. For the child questionnaires, items were administered on a tablet device. Children were able to respond to prompts by pressing their response on the tablet, responding verbally, or pointing to a visual guide that presented the answer choices in words and images (e.g., an empty bar for never and a half full bar for sometimes). Simultaneously, caregivers completed a packet of questionnaires. Caregivers were instructed to ask any questions they may have about completing the measures at the end of the child-portion of the assessment. The child received a small, developmentally-appropriate thank you gift for participating in the evaluation.

Online Assessments. For the final 17 families enrolled (29% of the sample), the full data collection session was conducted online due to the COVID-19 pandemic. The assessor emailed the caregiver informed consent documents along with parent questionnaires prior to meeting virtually with the child to conduct the assessment. Child assessments were conducted over the videoconferencing software Zoom. Child assent was obtained verbally at the beginning of the assessment. Based upon the child's preference, their caregiver either remained in the room with the child or waited in a nearby room while the child completed their questionnaires. The researcher provided verbal instructions to participants for each measure. Questionnaires which contained visuals were displayed via screen share on Zoom. Children were given the option to read assessment items independently or have the examiner read out all items. Children provided their responses by clicking on the online survey answer

choices or providing their answer verbally. Families received a \$10 Amazon gift card as a thank you gift for participating in the evaluation.

Participants

Participants included 59 children ($M_{\text{age}} = 9.9$ years, $SD = 1.3$; 69.5% male) who completed the study between the spring of 2nd grade and fall of 7th grade. Children were assigned to the ASD group if their parents reported their child had received a formal diagnosis of ASD. All but one of the children in the ASD group scored above the threshold on the Social Responsiveness Scale-2 (SRS-2; Constantino & Gruber, 2012) indicating ASD risk ($t \geq 60$); the child who scored below threshold was retained in the ASD group based on a confirmed clinical diagnosis of ASD. Participants were assigned to the TD group if their parent did *not* identify them as having a formal ASD diagnosis and their score on the SRS-2 fell below the threshold indicating ASD risk ($t < 60$). Notably, while the TD group represents a group of non-autistic children, some of the children have diagnoses in the areas of mental health, language, learning, or developmental disability, however, the TD label was utilized to be consistent with the majority of the literature in this area. One child in the TD group was excluded from analyses due to a clinically elevated score on the Social Responsiveness Scale-2 without a formal diagnosis of ASD; thus all analyses presented below include the remaining 58 participants ($M_{\text{age}} = 9.8$ years, $SD = 1.3$; 70.7% male). The ASD group included 22 children (90% male) and the TD group included 36 children (58% male).

Sociodemographic characteristics of children in this sample are presented in Table 1.

Measures

All child questionnaires were administered utilizing Qualtrics survey software. For children who participated in in-person visits, questionnaire measures were administered on a

tablet with touch screen technology. Children who participated in remote visits completed the questionnaires through the screen sharing feature (with the child verbally providing answers or manually completing the survey via remote access) on Zoom. The examiner administered the verbal abilities measure to all children, which required the child to provide verbal responses.

Child Measures

Verbal Abilities. Children were administered the vocabulary and similarities subtests from the verbal comprehension index (VCI) of the Wechsler Abbreviated Scale of Intelligence – Second Edition (WASI-II; Wechsler, 2011) to characterize the sample and ensure group matching on verbal abilities across the ASD and TD groups. Standard Scores were obtained for the VCI which have a mean of 100 and standard deviation of 15.

Friendship Quality. The Friendship Qualities Scale (FQS; Bukowski et al., 1994) contains 23 items that assess the quality of children’s relationships with an identified best friend. This measure has been widely used with both TD children and children with ASD (Bauminger, Solomon, & Rogers, 2010; Kasari et al., 2011; Sedgewick et al., 2016) and demonstrated good internal intra-scale reliability (Cronbach’s $\alpha = .71 - .86$) and validity (higher scores for reciprocated vs. non-reciprocated friendships and stable vs. unstable friendships) with a large sample of TD children (Bukowski et al., 1994). The measure assesses friendship quality across five dimensions: companionship (e.g., My friend and I spend all our free time together), Conflict (e.g., I can get into fights with my friend), Help (e.g., My friend helps me if I am having trouble with something), Security (e.g., If I have a problem at school or at home, I can talk to my friend about it), and Closeness (e.g., I feel happy when I am with my friend). For each statement, children were asked to respond on a

five-point scale from 1 (not at all true) to 5 (very true). Scores on items within each dimension are averaged to yield composite scores measuring each dimension. A total score was computed as the average of the five domain scores (conflict score reversed). In the current sample, intra-scale reliability was poorer than described in the normative sample. Reliability varied greatly across scales with companionship falling in the unacceptable range (Cronbach's $\alpha = .40$), conflict and security in the questionable range (Cronbach's $\alpha = .60 - .68$), and help and closeness in the acceptable range (Cronbach's $\alpha = .73 - .77$). The total score demonstrated good reliability (Cronbach's $\alpha = .80$). Intra-scale reliability was relatively consistent across diagnostic groups with the exception of security for which the scale showed poor reliability specifically for the ASD group (Cronbach's $\alpha = .55$) and acceptable reliability for the TD group (Cronbach's $\alpha = .72$). The lack of acceptable reliability across all domains of the scale suggests that results utilizing the companionship, conflict, and security subscale scores the current study should be interpreted with some caution.

Friendship Expectations. The measure of friendship expectations in this study is a modified version of the forced choice rating task developed by Furman and Bierman (1984). Participants were shown pairs of pictures that depict children engaging in various activities together and asked to indicate which activity they felt was more important based on how they expect their friends to act. The modified measure uses the same administration procedure as the original task but the images and picture labels (i.e., item text) were changed in order to adhere more closely to the specific friendship domains examined with the FQS. This measure was created as there was no existing friendship expectations measure which aligned the domains of expectations with quality. Aligning these measures was important in the current

study in order to make determinations about how well the friendship features utilized on a measure of friendship quality are expected by and relevant to the friendship experiences of children with ASD. Friendship expectation items were designed to closely replicate items from the FQS, be face valid, and easily comprehensible by elementary school students (See Appendix A for comparison of the modified items to FQS items). As in the original measure, pictures were all line drawings that were designed to depict only the stimulus behavior. Two pictures were presented to represent each domain from the FQS. Each set of pictures was presented with a prompt of “friends should” followed by labeling each card (e.g., “do fun things together” or “help each other”). The specific examples for each domain are as follows: Companionship (do fun things together, spend time together), Conflict (not get into fights, agree about many things), Help (help each other, stick up for each other), Security (talk about their problems, say sorry after a fight), and Closeness (feel happy when together, show they care for each other). All possible pairs of the ten pictures were presented to the child (45 pairs, gender-matched) with the order of presentation randomized for each participant (See Appendix B for sample items). Scores were summed within each domain for each time a child chose that domain as more important. Higher scores reflect greater expectations within that domain. In the current study, intra-scale correlations for scores on the two items within each domain were weak ($r = .17 - .22, p > .05$) with the exception of companionship ($r = .61, p < .001$) and closeness for which the two items were significantly negatively correlated ($r = -.28, p = .04$). In the case of closeness, this negative correlation was observed within both the TD and ASD groups. The lack of strong correlation in the majority of the subscales may represent true differences in expectations such that the expectation for one behavior may not indicate an expectation for other behaviors that fall within the same general domain. As the

purpose of this measure was to align with the existing FQS scales, the items were maintained despite poor evidence of intra-scale reliability.

Friendship Satisfaction. No instrument currently exists that is designed to specifically assess the friendship satisfaction of individuals with ASD. For the current study, a selection of four (out of five) questions used by Petrina et al. (2017) to assess friendship satisfaction was initially used. In the Petrina et al. (2017) study, which included one additional question excluded from the current study, there was good internal consistency (Cronbach's $\alpha = 0.76$). Participants were asked to rate the truth of statements on a 3-point scale (1 = never, 2 = sometimes, 3 = always). The statements presented were (1) My friendship with (insert best friend's name) is going well; (2) I feel happy when I am with (insert best friend's name); (3) I have a good friend; and (4) I am happy with my friendships. The first two items focus on the specific nominated friend from the FQS while the last two items assess general friendship satisfaction. A total score was calculated by summing all item scores with higher scores representing higher satisfaction. For this study, after completing the first twenty assessments, it was determined that this measure had little variability in responses for both groups (as described in the Results section on p. 42) and thus six additional items were generated to assess friendship satisfaction (See Appendix C for item text). These questions included three questions about children's satisfaction with their best friend and three questions about their satisfaction with their friends in general. The total score for the scale was calculated by summing the individual item scores. All twenty former participants were contacted and provided an opportunity to respond to the new friendship satisfaction items; thirteen of the twenty previous participants completed the items between one week and four months after

their original assessment date. Reliability of the new scale demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.75$).

Global Self-Worth. The six-item Global Self-Worth scale from the Self Perception Profile for Children (Harter, 2012) was administered. This measure is designed for children in grades 3-8 and has strong psychometric properties (Harter, 2012). Each item contains a positive and negative description of how "some children" feel and asks children to choose which statement best described them and then choose whether the chosen description is "really true for me" or "sort of true for me." Items are scored from 1 - 4 based on their selection. A sample item from the Global Self-Worth scale is "Some kids like the kind of person they are BUT Other kids often wish they were someone else." A domain score is calculated by averaging the item scores with higher scores representing higher self-worth. In the current sample, reliability was almost acceptable for TD children (Cronbach's $\alpha = .67$) and unacceptable for children with ASD (Cronbach's $\alpha = .35$). The unacceptable reliability in the ASD group suggests that results with this outcome measure should be interpreted with some caution.

Parent Measures

Demographics. Background information about the child and family was obtained through a demographic survey.

Autism Symptoms. The Social Responsiveness Scale-2 (SRS-2; Constantino & Gruber, 2012) is a widely-used parent-report measure of children's autistic traits. The school-age form is designed for children ages 4-18 and normed by child sex. It contains 65 items that are scored on a 4-point Likert-type scale, ranging from *not true* = 1, *sometimes true* = 2, *often true* = 3, to almost *always true* = 4. There are five SRS scales which each generate a T-

score: (1) social awareness; (2) social cognition; (3) social communication; (4) social motivation; and (5) autistic mannerisms. The subscale scores combine to a total score, with higher scores indicating greater autistic social impairment. In the current study, the 60th percentile was used as a cutoff for diagnostic group categorization as a score at or above the 60th percentile is consistent with at least mild impairment consistent with a diagnosis of ASD.

Quality of Life. The Pediatric Quality of Life Inventory, version 4.0 (PedsQL; Varni, Seid, & Rode, 1999) was used to assess quality of life. The parent form (ages 8-12) of the PedsQL contains 23-items which load onto four subscales: physical, emotional, social, and school functioning. Only the items on the emotional, social, and school functioning scales were administered in the current study to obtain the psychosocial health summary score. Parents rated whether each item has been a problem for their child in the last month based on the following scale: (0) never, (1) almost never, (2) sometimes, (3) often, (4) almost always. Parents completed two versions of the PedsQL. The first time they filled it out according to standard instructions and the second time parents filled it out with the following instructions: “Pretending that you are your son or daughter, answer the following questions as you think they would answer them.” Previous research by Sheldrick et al. (2012) has shown that a parent-proxy report in which a parent channels their child’s perspective is more closely aligned with their child’s own ratings of quality of life for adolescents with ASD. Both parent and parent-proxy psychosocial health summary score were examined as outcomes of children’s quality of life. The psychosocial health summary scale for both parent and parent-proxy versions demonstrated good intra-scale reliability (Cronbach’s alpha = .83 - .84).

CHAPTER 4

RESULTS

Descriptive statistics, correlations, and t-tests were analyzed using SPSS Statistics Version 26. Regression analyses were conducted in Mplus Version 8.4. Regression analyses for Aim 3 in Mplus utilize Full Information Maximum Likelihood (FIML) to address missing data on the friendship satisfaction variable (for 12% of the total sample). The use of FIML was not appropriate for Aims 1 and 2 as friendship satisfaction was the dependent variable. Table 2 presents means, standard deviations, and independent sample t-tests for study measures. Effect sizes are presented alongside results. Following Cohen's (1988) effect size conventions, t-tests are presented with Cohen's d (small effect: $d = .20$, medium effect: $d = .50$, large effect: $d = .80$) to indicate differences in population means, and hierarchical regression analyses are accompanied by Cohen's f^2 (small effect: $f^2 = .02$, medium effect: $f^2 = .15$, large effect: $f^2 = .35$) to indicate the marginal effect size of including a covariate in a variable set. Both a combined Cohen's f^2 (effect for the whole model) and local Cohen's f^2 (effect size attributable to the addition of new variables to the model) are presented alongside regression results. Interaction effects with marginal statistical significance values were decomposed when results indicated local effect sizes exceeded the cutoff for a small effect.

On the WASI-II VCI, which was measured to evaluate equivalence between groups, children with ASD exhibited markedly lower verbal abilities than the TD children in this

sample ($t(56) = -3.84, p < .001, d = 1.02$); see Table 2. On average, children with ASD demonstrated verbal abilities within the average range on the WASI-II VCI; the 15-point group difference is due to the elevated scores of the TD sample in the High Average range.

Across the full sample, WASI-II VCI scores were correlated with three of the four outcome variables (friendship satisfaction, $r = .47, p < .001$; parent-rated quality of life, $r = .37, p < .01$; and parent-proxy quality of life, $r = .33, p = .01$). In addition, WASI-II VCI scores were also associated with group membership in a point-biserial correlation ($r_{pb} = .46, p < .001$). As WASI-II VCI scores were so highly associated with diagnostic group membership, the associations between WASI-II VCI and outcome variables are believed to be accounting for variance attributable to diagnostic group. As further evidence, correlations between WASI-II VCI scores and outcome variables were not significant within either diagnostic group, with the exception of a correlation between WASI-II VCI and global self-worth for the ASD group (see Table 3). Therefore, because the inclusion of WASI-II VCI as a covariate would likely capture much of the variance attributable to diagnostic group, thereby clouding the ability to capture diagnostic group effects, WASI-II VCI scores were not entered as covariates into regressions except when the outcome of interest was global self-worth.

Preliminary Analyses

Friendship Quality. Independent sample t-tests compared the self-reported friendship quality of children with ASD and TD children for each of the five domains of the FQS as well as a total FQS score (see Table 2). Children with ASD exhibited a significantly lower total FQS score ($d = .83$) and reported their friendship as containing significantly more conflict, less help, and less security as compared to the friendships of TD children ($d_s = .54$ -

.74). Additionally, children with ASD reported experiencing marginally less companionship than their TD peers ($d = .54$). The difference between closeness scores for children with ASD and TD children was non-significant ($p = .11$); however, there was an almost medium effect size difference between groups, with the ASD group scoring lower on this domain ($d = .47$).

Bivariate correlations examined associations between individual domains and the total score of the FQS for children with ASD and TD children (see Table 3). For TD children, with the exception of conflict, all domains were significantly associated with each other ($r_s = .38 - .75$) as well as with the total score ($r_s = .63 - .88$). Conflict was not associated with any other domain but was negatively associated with the total FQS score ($r = -.40$; in the total score, conflict was reverse coded). For children with ASD, the only significant associations between domains were between conflict and help ($r = -.47$), help and security ($r = .69$), and security and closeness ($r = .65$); companionship was not significantly associated with any other domain of friendship quality. All domains were significantly associated with the total score ($r_s = .54 - .87$) with conflict as the only negative association.

Friendship Expectations. Across the TD and ASD groups, children ranked domains of friendship expectations similarly in terms of relative importance as determined by the amount of times they endorsed each domain. For both TD and ASD groups, help was rated as the most important domain followed by closeness, security, companionship, and lastly (lack of) conflict as the least important. Independent sample t-tests compared the amount of times friendship expectations were chosen as most important by children with ASD and TD children for each of the five expectation domains assessed (see Table 2). Children with ASD were significantly less likely to endorse help ($d = .72$) and closeness ($d = .66$) as important friendship expectations compared to TD children, while they were significantly more likely

to endorse the expectation of low conflict ($d = .63$). In addition, although the difference was not significant, children with ASD tended to select companionship as important more often than TD children ($d = .41$). Children with ASD and TD children did not differ on how much they endorsed the importance of security in their friendships ($d = .11$). Overall, while children with and without ASD indicated the same rank order of friendship expectations, the value placed on each domain was not equal across groups as demonstrated by significant differences between groups on three of the five expectation domains.

Friendship Satisfaction. The original friendship satisfaction measure used in this study that was developed by Petrina et al. (2017) was determined to lack sufficient variability to be utilized in planned analyses after the first twenty participants completed the study due to the presence of ceiling effects. On that measure, which was administered to all participants, the range of scores obtained in this sample was between 8-12 (out of a possible range of 4-12; $M = 11.26$, $SD = .97$) with 52% of children reporting a ‘perfect’ satisfaction score of 12; an independent sample t-test indicated that children with ASD and TD children were similarly satisfied with their friendships based on the original measure ($t(56) = -.75$, $p = .46$, $d = .20$; see Table 2). Due to the aforementioned limited variability and ceiling effects observed with the original satisfaction measure, a new friendship satisfaction measure was developed for use in this dissertation; the new measure utilized a wider scale (increased from three to five point response scale) and a greater number of items (increased from four to six); four of the six questions were reverse-scored items. The new measure improved the variability of responses (range of scores = 15-30 out of a possible range of 6-30; $M = 25.53$, $SD = 4.27$) and reduced the ceiling effect with only 20% of children reporting a ‘perfect’ satisfaction score. On this new scale, an independent sample t-test indicated that children

with ASD reported experiencing significantly less friendship satisfaction than their TD peers ($t(56) = -2.80, p = .01, d = .84$) (See Table 2). For all analyses involving friendship satisfaction, only the new scale of friendship satisfaction was utilized. As the new scale was developed and implemented midway through the study, there is a small amount of missing data (12% of participants) that is addressed in regression analyses using FIML when statistically appropriate.

Child Well-Being. Independent sample t-tests compared the well-being of children with ASD and TD children according to their own report as well as their parent's report (See Table 2). Children with ASD and TD children reported very similar levels of global self-worth ($d = .06$). For quality of life, children with ASD had significantly lower parent-reported quality of life than their TD peers ($d = 2.26$). Similarly, for the parent-proxy response, in which parents reported on the quality of life they thought their children would report, parents of children with ASD reported significantly lower quality of life scores for their children than the parents of TD children ($d = 1.79$). Bivariate correlations between measures of child well-being indicated that there was no association between children's ratings of global self-worth and parent or parent-proxy ratings of quality of life for the TD or ASD groups, whereas parent-rated and parent-proxy ratings of child quality of life were strongly associated in both groups ($r_s = .71-.73$; See Table 3).

Tests of Aim 1:

Evaluating diagnostic status as a moderator of the association between friendship quality and friendship satisfaction. A series of hierarchical multiple regression models were calculated to predict friendship satisfaction based on the following variables: friendship quality (FQS: total or domain score), diagnostic group (TD/ASD), and the interaction term of

friendship quality and diagnostic group to examine whether the association between friendship quality and friendship satisfaction is moderated by diagnostic status. Hierarchical regressions were utilized to determine whether the interaction term significantly improved upon the base model. Separate regressions were conducted for each of the FQS domains and FQS total score. In all analyses, friendship satisfaction served as the dependent variable, the FQS score was entered into the regression in the first step, diagnostic group status was entered in the second step, and the interaction term of the FQS score and diagnostic group was entered in the third step (See Table 4).

FQS Total Score. A three-step multiple regression model was calculated to examine the unique contributions and interaction effect of FQS total score and diagnostic group on friendship satisfaction (See Table 4). The first step examined the association between FQS total score and friendship satisfaction. The model was significant ($F(1,49) = 10.04, p = .003, R^2 = .17$, Cohen's $f^2 = .20$); FQS total score contributed a significant amount of variance to friendship satisfaction. In the second step, with diagnostic group included, the model was significant ($F(2,48) = 7.17, p = .002, R^2 = .23$, combined Cohen's $f^2 = .29$, local Cohen's $f^2 = .08$); both FQS total score and group accounted for a significant amount of unique variance. In the final step containing the interaction of FQS total score and diagnostic group, the overall model was significant ($F(3,47) = 5.79, p = .002, R^2 = .27$, combined Cohen's $f^2 = .36$, local Cohen's $f^2 = .05$). In this final model, the interaction term was marginally significant ($p = .09$), accounting for 4% of unique variance. Although the interaction term was not significant, it was further explored based upon the limited power within the sample and the small effect size demonstrated by the local Cohen's f^2 . Based upon visual inspection of the interaction (See Figure 1), contrary to my hypothesis, it appears that the friendship

satisfaction of children with ASD is more highly associated with their FQS total score than for TD children for whom the FQS total score was not associated with friendship satisfaction. Results of simple slope tests were consistent with that interpretation as only the slope for the ASD group was significant (ASD: $b = 4.01$, 95% CI [1.02, 7.00], $p = .01$; TD: $b = .47$, 95% CI [-2.40, 3.36], $p = .75$).

FQS Companionship. A three-step multiple regression model was calculated to examine the unique contributions and interaction effect of FQS companionship and diagnostic group on friendship satisfaction (See Table 4). The first step that examined the association between FQS companionship and friendship satisfaction was significant ($F(1,49) = 6.06$, $p = .02$, $R^2 = .11$, Cohen's $f^2 = .12$); FQS companionship explained a significant amount of variance in friendship satisfaction. In the second step, with diagnostic group included, the model was significant ($F(2,48) = 6.00$, $p = .01$, $R^2 = .20$, combined Cohen's $f^2 = .25$, local Cohen's $f^2 = .11$); diagnostic group significantly accounted for unique variance in friendship satisfaction, but FQS companionship did not explain additional unique variance in the model. In the final step including the interaction of FQS companionship and diagnostic group, the model was significant, but there was not a significant improvement over the previous model based upon the local Cohen's f^2 effect size ($F(3,47) = 4.16$, $p = .01$, $R^2 = .21$, combined Cohen's $f^2 = .27$, local Cohen's $f^2 = .01$); no individual variable explained a unique amount of variance in the final model.

FQS Conflict. A three-step multiple regression model was calculated to examine the unique contributions and interaction effect of FQS conflict and diagnostic group on friendship satisfaction (See Table 4). The first step examined the association between FQS conflict and friendship satisfaction and was marginally significant ($F(1,49) = 3.13$, $p = .08$,

$R^2 = .06$, Cohen's $f^2 = .06$). In the second step, with diagnostic group included, the model was significant ($F(2,48) = 4.92$, $R^2 = .17$, combined Cohen's $f^2 = .20$, local Cohen's $f^2 = .13$); diagnostic group contributed a significant amount of unique variance to the model, but FQS conflict did not explain additional variance in the model. In the final step containing the interaction of FQS conflict and diagnostic group, the model was significant ($F(3,47) = 4.42$, $p = .01$, $R^2 = .22$, combined Cohen's $f^2 = .28$, local Cohen's $f^2 = .06$). In this model, the interaction term was marginally significant and was further explored based upon the small effect size demonstrated by the local Cohen's f^2 . Simple slope tests indicated a marginally significant trend ($b = -1.63$, 95% CI $[-3.57, .31]$, $p = .10$) in which children with ASD experience less friendship satisfaction in relationships that feature greater conflict, whereas the amount on conflict in the relationships of TD children was not significantly associated with their friendship satisfaction ($b = 1.08$, 95% CI $[-1.27, 3.43]$, $p = .37$; See Figure 2).

FQS Help. A three-step multiple regression model was calculated to examine the unique contributions and interaction effect of FQS help and diagnostic group on friendship satisfaction (See Table 4). The first step examined the association between FQS help and friendship satisfaction and was significant ($F(1,49) = 8.64$, $p < .01$, $R^2 = .15$, Cohen's $f^2 = .17$); there was a significant association between FQS help and friendship satisfaction. In the second step, with diagnostic group included, the model was significant ($F(2,48) = 7.17$, $p = .002$, $R^2 = .23$, combined Cohen's $f^2 = .30$, local Cohen's $f^2 = .10$); both FQS help and diagnostic group explained a unique amount of variance in the model. In the final step containing the interaction of FQS help and diagnostic group, the model was significant but not a significant improvement over the previous model based upon the local Cohen's f^2

effect size ($F(3,47) = 4.95, p = .01, R^2 = .24$, combined Cohen's $f^2 = .32$, local Cohen's $f^2 = .01$); no individual predictor explained a unique amount of variance in the model.

FQS Security. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of FQS security and diagnostic group on friendship satisfaction (See Table 4). The first step of a multiple linear regression examining the association between FQS security and friendship satisfaction was significant ($F(1,49) = 6.68, p = .01, R^2 = .12$, Cohen's $f^2 = .14$); there was a significant association between FQS security and friendship satisfaction. In the second step, with diagnostic group included, the model was significant ($F(2,48) = 6.15, p < .01, R^2 = .20$, combined Cohen's $f^2 = .25$, local Cohen's $f^2 = .10$); diagnostic group was uniquely associated with friendship satisfaction, but FQS security did not explain additional variance in the model. In the final step containing the interaction of FQS companionship score and diagnostic group, the model was significant but did not represent a significant improvement over the previous model based upon the local Cohen's f^2 effect size ($F(3,47) = 4.65, p = .01, R^2 = .23$, combined Cohen's $f^2 = .30$, local Cohen's $f^2 = .03$). In this model, the interaction term did not add unique variance to the model.

FQS Closeness. A three-step multiple regression model was calculated to examine the unique contributions and interaction effect of FQS closeness and diagnostic group on friendship satisfaction (See Table 4). The first step examined the association between FQS closeness and friendship satisfaction and was not significant ($p = .22$, Cohen's $f^2 = .03$). In the second step, with diagnostic group included, the model was significant ($F(2,48) = 4.92, p = .01, R^2 = .17$, combined Cohen's $f^2 = .20$, local Cohen's $f^2 = .17$); diagnostic group accounted for a unique amount of variance in friendship satisfaction, but FQS closeness did not explain additional variance in the model. In the final step containing the interaction of

FQS companionship score and diagnostic group, the overall model was significant ($F(3,47) = 3.67, p = .02, R^2 = .19$, combined Cohen's $f^2 = .23$, local Cohen's $f^2 = .02$); no individual predictor explained a unique amount of variance in the model.

Tests of Aim 2:

Evaluating the associations between domains of friendship quality and friendship satisfaction. All five domains of the FQS were to be entered into separate multiple regression equations to assess the unique contribution of each domain on friendship satisfaction for children with ASD and TD children. Due to issues of multicollinearity and suppressor effects, models requiring all five domains to be simultaneously entered into one model were not analyzed. Instead, bivariate correlations between domains of the FQS and friendship satisfaction were examined for each group. Examining the TD and ASD groups separately, no individual domain of the FQS was significantly associated with friendships satisfaction ($r_s = -.05 - .32, p_s > .15$) (see Table 3).

Evaluating the moderating role of friendship expectations for children with ASD. A series of multiple linear regressions were calculated to explore the potential role of friendship expectations as a moderator of the relationship between friendship quality and friendship satisfaction for children with ASD. For each of the five domains of the FQS (companionship, conflict, help, security, closeness) the analyses were conducted separately in the following manner. Friendship satisfaction served as the dependent variable in the regression. In the first step, the FQS domain score was entered into the regression. In the second step, the friendship expectation score for that same domain was entered. In the third step, the interaction term of FQS domain score by matched domain expectation score was entered (See Table 5).

Companionship. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of companionship quality and companionship expectations on friendship satisfaction (See Table 5). None of the three models nor any explanatory variables were significant and effect sizes were low (Cohen's $f^2 < .08$).

Conflict. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of conflict quality and conflict-related expectations on friendship satisfaction (See Table 5). None of the three models nor any explanatory variables were significant and effect sizes were very small (Cohen's $f^2 < .10$).

Help. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of help quality and help-related expectations on friendship satisfaction (See Table 5). Although the first step of the model containing FQS help as the only explanatory variable was not significant, in the second step, with help-related expectations included, FQS help contributed a significant amount of unique variance to friendship satisfaction while help-related expectations did not contribute additional unique variance to the model. The second model did not reach significance despite a medium effect size ($R^2 = .19$, Cohen's $f^2 = .23$). The final step of the model containing the interaction term was not significant.

Security. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of security quality and security-related expectations on friendship satisfaction (See Table 5). Although the first step of the model containing FQS security as the only explanatory variable was not significant, in the second step, with security expectations included, both FQS security and security expectations contributed a significant amount of unique variance to friendship satisfaction. While the two independent variables in

the model were significant, the second step of the model was only marginally significant with a large effect size ($F(2,18) = 3.50, p = .05, R^2 = .28$, Cohen's $f^2 = .39$). The final step of the model containing the interaction was marginally significant, ($F(3,17) = 2.67, p = .08, R^2 = .32$, combined Cohen's $f^2 = .47$, local Cohen's $f^2 = .06$), had a large effect size, and was a small improvement over the second step in the model based upon the local Cohen's f^2 effect size. However, despite the marginal significance and large effect size of the third step of the model, the interaction term did not individually explain a statistically significant or clinically meaningful amount of unique variance in the final model and thus was not further explored.

Closeness. A three-step multiple regression was calculated to examine the unique contributions and interaction effect of closeness quality and expectations on friendship satisfaction (See Table 5). The first step of the model was not significant. The second step of the model was marginally significant with a medium effect size ($F(2,18) = 2.69, p = .10, R^2 = .23$, Cohen's $f^2 = .30$). Only closeness expectations contributed a significant amount of unique variance to friendship satisfaction in the second step; FQS closeness did not contribute a significant amount of unique variance to the model. The final step of the model containing the interaction was not significant.

Tests of Aim 3:

Evaluating diagnostic status a moderator of the associations between friendship quality, friendship satisfaction, and child well-being. Multiple linear regression models were calculated utilizing the full sample to evaluate whether diagnostic status moderated the association between friendship satisfaction and child well-being and/or friendship satisfaction and child well-being. Due to the limited sample size and power of the current study, a full three-way interaction was not explored. For all analyses, one of the child well-

being measures served as the dependent variable. In the first step, friendship quality and satisfaction were entered. In the second step, diagnostic status was entered. The two interaction terms of (1) friendship quality and diagnostic status and (2) friendship satisfaction and diagnostic status were entered in the third step.

Global Self-Worth. A three step multiple regression model was calculated to examine the interaction effects of friendship quality, friendship satisfaction, and diagnostic group on global self-worth (See Table 6). In all three models, WASI-II VCI scores were entered as control variables. None of the three models were significant and effect sizes were low (R^2 s = .05 - .07, Cohen's f^2 s = .05 - .09).

Parent-Rated Quality of Life. A three step multiple regression model was calculated to examine the contributions and interaction effects of friendship quality, friendship satisfaction and diagnostic group on parent-rated quality of life (See Table 6). In the first step, the model was significant ($F(2,56) = 5.23, p = .01, R^2 = .16$, Cohen's $f^2 = .19$) and satisfaction contributed a unique amount of variance to the model over and above the effect of friendship quality. The second model was significant with a large effect size ($F(3,55) = 24.85, p < .001, R^2 = .58$, combined Cohen's $f^2 = 1.38$, local Cohen's $f^2 = 1.00$); the only variable to contribute a significant amount of unique variance was diagnostic group. Neither quality nor satisfaction contributed a significant amount of unique variance to the model. The third and final multiple linear regression analysis examined diagnostic status as a moderator of the association between friendship quality and parent-rated quality of life as well as the association between friendship satisfaction and parent-rated quality of life. The model was significant ($F(5,53) = 21.11, p < .001, R^2 = .67$, combined Cohen's $f^2 = 2.03$, local Cohen's $f^2 = .27$). There was a medium effect of adding the interaction terms which added an

additional 9% of variance to the model. In this model, the two interaction terms were significant. Simple slope tests were used to further examine each interaction effect.

For the interaction between friendship quality and diagnostic group, simple slope tests indicated that for children with ASD, surprisingly, quality of life decreases as friendship quality improves ($b = -13.88$, 95% CI $[-24.13, -3.62]$, $p = .01$), whereas the reported amount of friendship quality for TD children was not associated with their parent's ratings of their quality of life ($b = 6.81$, 95% CI $[-1.75, 15.36]$, $p = .12$; see Figure 3a). For the interaction between friendship satisfaction and diagnostic group, simple slope tests indicated that parents report that children with ASD experience greater quality of life when they report higher satisfaction with their friendships ($b = 1.62$, 95% CI $[.55, 2.68]$, $p < .01$), whereas the amount of reported friendship satisfaction was not associated with parent reported quality of life for TD children ($b = -1.01$, 95% CI $[-2.61, .59]$, $p = .22$; see Figure 3b).

Parent-Proxy Quality of Life. A three step multiple regression model was calculated to examine the interaction effects of friendship quality, friendship satisfaction, and diagnostic group on parent-proxy quality of life (See Table 6). In the first step, the model was significant ($F(2,56) = 4.85$, $p = .01$, $R^2 = .15$, Cohen's $f^2 = .18$); both friendship quality and friendship satisfaction contributed a marginally significant amount of unique amount of variance to the model. The second model was significant with a large effect size ($F(3,55) = 15.96$, $p < .001$, $R^2 = .47$, combined Cohen's $f^2 = .89$, local Cohen's $f^2 = .60$); the only variable to contribute a significant amount of unique variance was diagnostic group. Neither quality nor satisfaction contributed a significant amount of unique variance to the model. The third and final multiple linear regression analysis examined diagnostic status as a moderator of the association between friendship quality and parent-proxy quality of life as well as the

association between friendship satisfaction and parent-proxy quality of life. The model was significant ($F(5,53) = 9.99, p < .001, R^2 = .49$, combined Cohen's $f^2 = .96$, local Cohen's $f^2 = .04$); no independent variable contributed a significant amount of unique variance to the model.

CHAPTER 5

DISCUSSION

The current study had three overarching aims: 1) to examine the association between friendship quality and friendship satisfaction as moderated by diagnostic group, 2) to explore the relative strength of the associations between the domains of friendship quality and friendship satisfaction for children with ASD and TD children, and 3) to examine the relative strength of the associations between friendship quality, friendship satisfaction, and child well-being for children with ASD and TD children. This study differed from previous studies of the friendships of children with ASD by examining associations between three aspects of children's friendships – their friendship quality, friendship expectations, and friendship satisfaction -- in a single study, as well as examining how these aspects of friendship relate to children's well-being.

With regard to friendship quality, the sample of children with ASD in the current study reported experiencing lower quality best friendships than the comparison sample of TD children. Specifically, they reported that their friendships were marked by greater conflict and less help and security, as well as marginally less quality in the domains of companionship and closeness. This finding was mostly consistent with a review of ten studies on the friendships of children with ASD that found mostly lower quality scores for

children with ASD as compared to TD peers on all friendship quality domains except for conflict, for which there were inconsistent findings of group differences (Petrina et al., 2014).

The current sample of children with ASD reported experiencing less friendship satisfaction than their TD peers. Unlike with friendship quality, the current findings on friendship satisfaction are inconsistent with the small literature in this area, which has reported children with ASD to be similarly satisfied as their TD peers (Calder et al., 2013; Petrina et al., 2017). Notably, when the current study utilized the friendship satisfaction measure developed and used in the only quantitative study of friendship satisfaction in children with ASD (Petrina et al. 2017), the current sample of children with ASD reported a similar amount of satisfaction as their TD peers, which is consistent with the results of the original study. Yet, when a new friendship satisfaction measure was implemented to increase variability and reduce ceiling effects of responses by including additional items and more response options per question, greater divergence was seen between the friendship satisfaction of children with ASD and TD children. This finding may be due to the increased variability in children's responses, as well as the item-level differences between the original satisfaction measure which only contained positively worded prompts (e.g., "My friendship with my best friend is going well") and the new measure which included specific prompts meant to capture dissatisfaction (e.g., "I wish my best friend treated me differently"). Based on the results of the current study, it is likely the case that children with ASD are feeling less satisfied with their friendships than their TD peers and that their dissatisfaction may be more nuanced than existing measures were able to assess.

With regard to the first aim, which sought to examine the associations between friendship quality and friendship satisfaction for children with ASD and TD children,

contrary to hypothesis 1a, the association between friendship quality and friendship satisfaction was stronger for children with ASD than for their TD peers. This lack of association between friendship quality and friendship satisfaction for TD children is inconsistent with past findings of moderate to strong associations between domains of friendship quality and reported satisfaction (Ladd et al., 1996; Parker & Asher, 1993). In fact, in the current study, no domain of friendship quality nor the total score was significantly related to friendship satisfaction for the TD group. Notably, the studies of satisfaction in TD children do not include negatively oriented items, and if the results of the current study are an indication, including negatively framed items in a satisfaction scale is important for obtaining sufficient variability. As in the Petrina et al. (2017) study of satisfaction for children with ASD, it is possible that the friendship satisfaction measures used in the studies of TD children - which did not assess for areas of dissatisfaction – did not capture the entirety of experiences that comprise satisfaction. Additionally, unlike the measure of friendship satisfaction used in this study which explored satisfaction with both a child's best friend and across all of their friendships, the studies of TD children that have examined satisfaction used measures that only asked about satisfaction with a single friend (Ladd et al., 1996; Parker & Asher, 1993). TD children may have a larger network of friendships where no individual friendship has to provide all of the key features of friendships as they may find their needs met across a variety of relationships, whereas children with ASD with their smaller social networks may rely more heavily upon their best friend for satisfaction. As none of the measures used to measure friendship satisfaction have been properly validated, these results speak to the need for reliable and valid measurement tools to ensure proper assessment of this construct.

While there was no association between reported levels of friendship quality and friendship satisfaction for TD children, children with ASD who reported their friendships as higher quality also reported greater satisfaction with their friendships. This finding, which had not been tested in past research, suggests that the quality of the friendships of children with ASD may be a significant determinant of their friendship satisfaction. This association suggests that some commonly held notions about children with ASD may be overstated, such that they may be more easily satisfied by lower quality friendships. The current results suggest that children with ASD may in fact be *more* sensitive, not less sensitive, to lower-quality friendships than TD children. Given that children with ASD typically have fewer reciprocal friendships than TD children (Rowley et al., 2012), it may be that the quality of their best friendship may play an outsized role in their overall friendship satisfaction as compared to TD children.

In addition to analyses examining friendship quality as a unitary construct, this study also explored distinct domains of friendship quality, including examining diagnostic group as a moderator of the association between these domains and friendship satisfaction. Hypothesis 1b posited that there would be weaker associations between friendship satisfaction and the domains of conflict, help, and closeness for children with ASD as compared to TD children. However, only the conflict domain, and no other domains of friendship quality, interacted with diagnostic group to predict satisfaction, and this interaction effect was in the opposite direction as hypothesized. Results indicated that greater relational conflict resulted in lower friendship satisfaction for children with ASD, whereas the amount of conflict TD children experienced in their relationships was not associated with their reported amount of friendship satisfaction. Based on the current findings, it seems that when children with ASD perceive

conflict within their relationships, it is more damaging to their overall friendship satisfaction than for their TD peers. This is consistent with how children with ASD rated a lack of conflict as a greater friendship expectation as compared to TD children in the current study. It may be the case that children with ASD struggle to recognize that a friendship can be satisfactory despite the presence of conflict or that conflict for children with ASD may be more likely to include negative peer experiences such as bullying which harms the relationship. In addition, children with ASD may be less equipped to handle and effectively resolve conflicts with their friends when they emerge, whereas TD children can intuitively learn how to manage conflict in the context of their relationships and better maintain their friendships as a result. These possibilities suggest that children with ASD may benefit from social skills interventions specifically in the areas of social problem solving and conflict resolution; such support could serve the dual benefit of helping children to both better navigate interpersonal conflicts and also feel more satisfied within their relationships.

With regard to the second aim, I explored which domains of friendship quality were most closely associated with friendship satisfaction for children with ASD and TD children. Based on prior research showing significant correlations between all domains of friendship quality and friendship satisfaction for TD children (Ladd et al., 1996; Parker & Asher, 1993), I posited that for TD children, all domains of friendship quality would be significantly associated with friendship satisfaction (hypothesis 2a). Contrary to my hypothesis, none of the friendship quality domains correlated with friendship satisfaction for TD children. The findings of the current study are also contrary to the second part of hypothesis 2a, which stated that for children with ASD, friendship quality in the domains of companionship and security would be most closely associated with friendship satisfaction. Similarly as for the

TD group, no individual domain of friendship quality was significantly associated with friendship satisfaction for children with ASD. As was stated earlier, previous studies examining friendship satisfaction have assessed this construct with only a few questions which were all worded in a positive direction. Therefore, it is possible that the current measure of friendship satisfaction, which assesses potential areas of dissatisfaction as well as satisfaction, is capturing a more nuanced and complex view of this construct. Another interpretation may be that the friendship satisfaction measure, which focused both on best friendship and overall friendships, may be capturing a wider range of friendship experiences than did the quality measure, which focused on best friendships. Resultingly, the domains of friendship quality would likely account for a smaller proportion of friendship satisfaction. Thus, quality alone may not capture all aspects of what makes a friendship satisfying for either TD children or children with ASD. Future research should engage in a deeper exploration of satisfaction in a more qualitative manner to determine what other factors may contribute to feelings of satisfaction in the event of a low quality best friendship.

I further explored friendship expectations as a moderator of the associations between domains of friendship quality and friendship satisfaction within the ASD group. The current study utilized a novel measure of friendship expectations which resulted in a forced ranking system to indicate which domain of friendship children believe to be the most important. This measure was developed to align the measure of friendship expectations with the measure of friendship quality in order to more accurately assess the associations between the constructs. This results from this new measure were consistent with the only other quantitative study of the friendship expectations of children with ASD in finding that children with and without ASD rated expectation domains similarly to one another (Bottema-

Beutel et al., 2019). In the current study, children most frequently chose help as an important expectation they hold for their friendships, followed by expectations around closeness, security, companionship, and conflict. Contrary to hypothesis 2b, friendship expectations did not moderate the associations between any of the domains of friendship quality and friendship satisfaction for children with ASD. In other words, the associations between individual friendship quality domains and friendship satisfaction for children with ASD is not dependent upon their level of expectations within that domain. While the current study was statistically underpowered to detect interaction effects within the ASD sample due to the small sample size, it may be the case that for children with ASD, these friendship expectations are not very salient within the context of their friendships or that they hold their friendship expectations more lightly than hypothesized based upon the literature for TD children and adults (Hall et al., 2011; MacEvoy, Papadakis, Fedigan, & Ash, 2016). In that case, it would mean that whether or not a friend meets their friendship expectations would not have a significant impact on their friendship satisfaction.

Despite the lack of moderation, there were significant associations found between two domains of friendship expectations and friendship satisfaction. Specifically, for the domain of security, both security quality and security expectations contributed a significant amount of variance in a multiple regression model with friendship satisfaction as the dependent variable, however, these effects were in opposite directions such that quality had a positive association and expectations had a negative association with satisfaction. In other words, children with ASD who reported more security in their friendships reported higher satisfaction, and at the same time, children with ASD who reported greater security-related expectations were more likely to report lower satisfaction. This finding suggests that children

with ASD may experience unmet needs in the area of security resulting in lower satisfaction. It is possible that children with ASD have unrealistic expectations within this domain which is focused upon reliability and reconciliation. Given the young age of this sample of children with ASD, their friends may not have sufficiently advanced skills which are needed to navigate difficult social situations resulting in dissatisfaction within the relationship. Alternatively, given the known social difficulties faced by children with ASD in the school system, including peer rejection and bullying, the presence of security in their friendship may be critically important and their friends may be unable to live up to their high expectations.

For the domain of closeness, friendship expectations were positively associated with friendship satisfaction. Children with ASD who reported that it was more important to engage in behaviors reflecting emotional closeness and positive appraisal also reported higher levels of friendship satisfaction. It may be that, regardless of how well they feel their friends engage in these behaviors, children with ASD place a greater emphasis on closeness within their friendship are acting consistently with those values, contributing to a more satisfying friendship experience. Alternatively, given that this study was taken at a single time point and directionality cannot be inferred, it is also reasonable that children with ASD who feel satisfied with their friendships may come to expect more of the affective components of friendships from their close friends once other more basic needs have been met. Future research should elucidate the potential mechanisms of action between expectations of closeness and friendship satisfaction.

The final overarching aim of this study was to examine the relative strength of the associations between friendship quality, friendship satisfaction, and child well-being for children with ASD and TD children. The findings of the current study provided inconsistent

support for hypothesis 3, which stated that friendship satisfaction would be a stronger predictor of child well-being for children with ASD and friendship quality would be a lesser predictor of friendship quality for children with ASD as compared to TD children.

Hypothesis 3 was unsupported for the child well-being outcome of global self-worth such that there was no association between friendship quality or friendship satisfaction and global self-worth. For children's self-reported ratings of global self-worth, results of the current study are inconsistent with past findings such that children with ASD and TD children reported experiencing similar levels of self-worth. This finding was unexpected given that the same scale was utilized in the current study as the past studies with children and adolescents with ASD (Bottema-Beutel et al., 2019; Williamson et al., 2008). Further, in a multiple regression analysis, neither friendship quality nor friendship satisfaction were associated with children's ratings of global self-worth. However, partially consistent with one study that found multiple friendship quality domains including closeness were associated with self-worth for children and adolescents with ASD (Bauminger et al., 2004), the quality domain of closeness was strongly correlated with perceptions of self-worth for children with ASD in the current study. Having friends who care and express positive feelings towards a child with ASD may help to bolster their feelings of self-worth.

Hypothesis 3 was partially supported for the child well-being outcome of parent-rated quality of life such that diagnostic group did moderate the associations between parent-rated quality of life and both friendship quality and friendship satisfaction. Consistent with my expectations, friendship satisfaction was a stronger predictor of quality of life for children with ASD than TD children, however, inconsistent with my hypothesis, friendship quality was also a stronger predictor of quality of life for children with ASD than TD children.

Interestingly, while friendship satisfaction was positively associated with quality of life, friendship quality was negatively associated with quality of life for children with ASD. Given the cross-sectional nature of the findings, it may be the case that children whose parents rate them as having lower quality of life may be more likely to create friendships with other children who are more sensitive and responsive to the needs of a child with ASD. It could also be that those children with lower quality of life are provided with greater supports by parents or other caregivers to bolster their friendships resulting in a higher quality friendship than would be achieved by a child who is functioning more independently at a higher level. The positive association between friendship satisfaction and parent-rated quality of life for children with ASD is consistent with past research on adults with ASD indicating that positive perceptions of social support are associated with stronger quality of life (Bishop-Fitzpatrick et al., 2017; Moss et al., 2017; Tobin et al., 2014). This finding adds to the literature for children with ASD that positive feelings derived from a satisfying relationship may contribute more broadly to positive well-being. Surprisingly considering the associations found for parent-report of quality of life, hypothesis 3 was unsupported for the parent-proxy quality of life outcome such that diagnostic group did not moderate the association between friendship quality or friendship satisfaction and parent-proxy quality of life. While there were marginally significant positive associations between parent-proxy quality of life and both friendship quality and friendship satisfaction, these associations became non-significant once diagnostic group was accounted for and there were no interaction effects. Parent-proxy ratings of quality of life were found to more closely resemble the ratings of adolescents with ASD (ages 12-18) in previous research (Sheldrick et al., 2012), however, as the current study did not gather quality of life ratings directly from

children with ASD it cannot be discerned whether the lack of associations with the parent-proxy measure was due to the lack of concordance of the parent-proxy form in this younger age group of children with ASD or due to a true lack of association between friendship quality, satisfaction, and children's perceptions of their quality of life.

As both quality of life and global self-worth are broad constructs, it is not surprising that results of the current study were inconsistent with regard to the associations with friendship quality and friendship satisfaction. A brief measure may not capture all of the ways that friendships can affect children's well-being and it is to be expected that friendships would be only one of many factors that impact child well-being. In particular, within the social domain, children may have a meaningful best friendship, as assessed within the current study, but may also have additional friendships or peer networks that significantly contribute to both their social satisfaction and well-being. Future studies should seek look at friendships and peer relationships more broadly along with other determinants of well-being for children with ASD including age, adaptive and functional behaviors, education, and comorbid psychiatric conditions (Chiang & Wineman, 2014).

Conclusions and Clinical Implications

The current study provides initial evidence that children with ASD are less satisfied with their friendships than TD children and that friendship quality is a determinant of friendship satisfaction for children with ASD. The finding that children with ASD are less satisfied in their friendships logically flows from a significant amount of previous research documenting reduced friendship quality for children with ASD. However, to date, the literature indicated that children with ASD were similarly satisfied as their TD peers. While the hypotheses of the current study were developed based on assumptions that measures of

friendship quality were inaccurately capturing the construct of friendship quality for children with ASD, results of the current study suggest that, historically, the construct of friendship satisfaction may not have been assessed well and that children with ASD are in fact less satisfied with their friendships than was previously reported.

The current study emphasizes the fact that friendships matter for children with ASD. In addition to the finding that higher overall quality of friendships is associated with greater self-reported satisfaction for children with ASD, greater friendship satisfaction was also associated with greater parent-reported quality of life. While the current study was only a snapshot of a single timepoint, these findings are consistent with the likelihood of downstream positive effects of having satisfying friendships in middle childhood. In addition, specific domains of friendship also emerged as particularly important for children with ASD. In particular, children with ASD who reported less security and experiencing greater amounts of conflict within their best friendship also reported less friendship satisfaction, while children with ASD who reported experiencing less closeness within their best friendship also reported lower feelings of self-worth. Parents, teachers, and clinicians should be aware of the differential impact of conflict, security, and closeness on children's feelings of satisfaction and well-being to introduce interventions as necessary to bolster children's friendship quality in these areas. Notably, in addition to an opportunity to offer direct intervention to children with ASD through social skills or social problem solving interventions, the domains of conflict, security, and closeness are also very amenable to peer intervention. To reduce the burden on children with ASD to alter their own behaviors, peers can also be provided education and coaching to increase their understanding of their friends

with ASD, learn to effectively manage and resolve conflicts, and develop closer relationships.

Limitations

The findings of the current study must be interpreted in the context of some potential limitations. The current sample, like many other study samples in this field of study, is limited in size, particularly with regard to the ASD group, which limited the statistical power of the analyses. This reduced power may have reduced the ability to detect significant effects for within-group analyses for the ASD group. Due to the limited sample size, this study may not be generalizable to the broader population of children with ASD. Moreover, in the current study, there was a small amount of missing data on the friendship satisfaction measure due to the addition of these questions midway through the study; this missingness was not able to be addressed for analyses in which friendship satisfaction was the dependent variable resulting in decreased statistical power. An additional limitation is due to the non-equivalence of the ASD and TD groups on a measure of verbal ability. Thus, the possibility that some group differences were due to the elevated verbal abilities of the TD group as opposed to true group differences cannot be fully ruled out, however, attempts were made to statistically address this discrepancy which increases confidence in the results. Another limitation of the current study regards validity of measurement of some key variables. Both the friendship satisfaction and friendship expectation measures were developed specifically for use in the current study and have not been validated. Additionally, the current study was underpowered to complete tests of measurement equivalence to ensure equivalency across groups for both new measures as well as existing measures including the Friendship Qualities Scale.

Unfortunately, data collection for this study was impacted by the Covid-19 pandemic. In addition to altering the format of data collection, the onset of the pandemic likely resulted in reduced exposure to friends for the children who participated after initial quarantines were imposed. Inspection of the data did not indicate loss of friendship quality or satisfaction for children who participated after the onset of COVID-19, but as the pandemic persisted, the reality that children were not able to spend time with friends was viewed as a significant threat to the validity of the data and data collection terminated prior to obtaining the planned sample size.

Future Directions

The current study contributes to the literature on the friendships of children with ASD, particularly adding a critical new perspective on friendship satisfaction. Future studies should seek to validate friendship measures across both the TD and ASD populations to ensure results represent true group differences. To accomplish that goal, there is a need for additional qualitative research to elucidate the factors that contribute to friendship satisfaction for both TD children and children with ASD. The existing and/or novel friendship measures should also be aligned with one another, as was done in the current study, to support researchers' ability to make accurate inferences about associations between these friendship variables. Further, methods such as cognitive interviewing could be employed to ensure children with and without ASD are comprehending items similarly and consistently with the intended construct. Additionally, future studies should utilize longitudinal methods to help establish directionality of the associations between friendship quality, satisfaction, and well-being outcomes as well as larger sample sizes to improve generalizability. Findings from the current study suggest some potential avenues for

interventions that can support children in developing satisfying friendships. Future studies should examine how such interventions affect both perceptions of friendship quality and satisfaction, in addition to more global effects on children's well-being. Ultimately, there is still a significant amount that is not known about the friendships of children with autism, particularly with regard to their personal perceptions and internal experiences, which offers many future avenues for research to explore with the goal of supporting children with ASD to develop and maintain friendships that are rewarding and fulfilling.

Table 1

Sociodemographic characteristics of participants

Child Characteristics	M(SD) / %	
	ASD (n=22)	TD (n=36)
Age (Months)	120.50 (16.75)	116.61 (15.64)
Gender (% Male)	90.9%	58.3%
Grade		
2 nd - 3 rd	36.4%	33.4%
4 th - 5 th	36.4%	50.0%
6 th - 7 th	27.3%	16.7%
Classroom Placement		
General Education	40.9%	94.4%
Special Education	22.7%	0%
Integrated Classroom	36.4%	0%
Gifted Placement	0%	5.6%
Formal Diagnoses		
ASD/Autism/Pervasive Developmental Disorder	100%	0%
Attention Deficit Hyperactivity Disorder	54.5%	8.3%
Anxiety	9.1%	8.3%
Learning Disorder	4.5%	8.3%
Speech/Language Disorder	0%	2.8%
Sensory Processing Disorder	9.1%	0%
Race and Ethnicity		
Asian	9.1%	2.8%
Black	9.1%	0%
White (Latinx)	0%	5.6%
White (Non-Latinx)	72.7%	80.6%
Multi-Ethnic/Racial	4.5%	11.1%
Other	4.5%	0%
Primary Parent Education		
12 th grade/High school diploma/GED	4.5%	2.8%
Vocational school/Other non-college certificate	4.5%	0%
1-3 years college/Associate's Degree	9.1%	5.6%
College Degree	40.9%	19.4%
Master's Degree	31.8%	50.0%
Professional Degree	9.1%	22.2%
Household Income		
\$0 - \$50,000	9.1%	0%
\$50,001 - \$100,000	27.3%	16.7%
\$100,000 - \$150,000	36.4%	19.4%
\$150,000 +	22.7%	58.3%
Did not report	4.5%	5.6%

Table 2

Means of study measures for ASD and TD groups

Child Characteristics	M(SD)		t	p	d
	ASD (n=22)	TD (n=36)			
WASI-II VCI	98.77 (16.39)	114.19 (13.85)	-3.84	<.001	1.02
SRS-2 Total Scaled Score	74.09 (9.56)	47.08 (5.87)	13.36	<.001	3.40
Friendship Qualities Scale					
Companionship	3.52 (.80)	3.90 (.57)	-1.95	.06	.54
Conflict	2.27 (.87)	1.84 (.65)	2.16	.04	.56
Help	3.64 (.92)	4.09 (.74)	-2.07	.04	.54
Security	3.58 (.76)	4.13 (.72)	-2.80	.01	.74
Closeness	4.22 (.70)	4.51 (.51)	-1.62	.11	.47
Total	3.74 (.55)	4.16 (.46)	-3.16	<.01	.83
Friendship Expectations					
Companionship	8.73 (3.35)	7.31 (3.48)	1.53	.13	.41
Conflict	7.59 (3.20)	5.50 (3.44)	2.30	.03	.63
Help	10.36 (3.81)	12.75 (2.77)	-2.76	.01	.72
Security	9.00 (3.39)	8.64 (3.42)	.39	.69	.11
Closeness	9.31 (2.28)	10.81 (2.25)	-2.43	.02	.66
Friendship Satisfaction					
Original Scale (n=58)	11.13 (1.21)	11.33 (.79)	-.75	.46	.20
New Scale (n=51)	23.48 (5.23)	26.97 (2.73)	-2.80	.01	.84
Child Well-Being					
Global Self-Worth	3.30 (.49)	3.33 (.53)	-.25	.80	.06
PedsQL Parent Rating	49.17 (15.56)	80.42 (11.80)	-8.65	<.001	2.26
PedsQL Parent-Proxy Rating	53.18 (17.55)	80.17 (12.12)	-6.93	<.001	1.79

Table 3

Bivariate correlations between study variables for ASD and TD groups

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1		-.12	-.06	.12	.07	-.02	-.14	.30	.21	.44**	.37*	.03	.28	.33	.34*	.21	.10
2	.03		-.09	-.36*	.32	.15	.07	-.06	.14	.03	-.04	-.02	-.06	.23	-.08	.09	-.16
3	.18	-.20		.21	-.51**	-.76***	-.09	-.02	.16	-.55**	-.37*	-.18	-.39*	-.21	-.11	.03	-.07
4	-.05	-.56**	.02		-.53**	-.52**	-.41*	.10	-.10	-.11	.01	-.05	.01	-.04	.28	.12	.20
5	-.18	.42	-.51*	-.64**		.36*	-.18	-.00	-.19	.25	.05	-.14	.12	.16	.22	-.02	-.26
6	.08	.02	-.49*	-.24	.09		-.01	.05	.02	.44**	.33*	.26	.31	.28	-.22	-.17	-.04
7	-.01	.34	.08	.01	-.15	-.59**		-.19	.11	.04	.01	.14	-.03	-.25	-.19	.05	.18
8	-.12	.12	-.05	.09	-.27	.32	-.07		.14	.54**	.38*	.57***	.63**	.16	.10	.33*	.13
9	.71***	-.14	.31	-.18	-.06	.00	-.10	-.13		-.16	-.23	-.10	-.40*	.23	-.03	.19	.21
10	-.41	.41	-.52*	-.28	.46*	.25	.03	.31	-.47*		.75***	.64***	.88***	.25	.28	.24	.20
11	-.21	.54**	-.63**	-.46*	.62**	.45*	-.13	.34	-.06	.69***		.62***	.85***	.09	.03	.20	.20
12	-.26	.61**	-.32	-.48**	.63**	.03	.07	.06	-.04	.39	.65**		.79***	-.05	-.26	.30	.35*
13	-.52*	.53*	-.54**	-.26	.43*	.31	.00	.55**	-.54**	.87***	.79***	.60*		.08	.08	.24	.18
14	-.27	.38	-.08	.15	-.13	-.25	.46*	.24	-.26	.32	.32	.18	.41		.32	.27	.81
15	-.07	.53*	.00	-.16	.32	-.20	-.01	.14	-.14	.18	.30	.65**	.39	.15		.10	.07
16	-.20	.00	.27	.30	-.31	-.37	.25	-.21	-.06	-.35	-.29	-.01	-.24	.28	.07		.71***
17	-.36	.22	.47*	.03	-.16	-.52*	.30	-.16	-.31	-.15	-.28	.18	-.03	.20	.40	.73***	

Note. Correlations for the TD group are presented above the diagonal and correlations for the ASD group are presented below the diagonal. 1 = Age, 2 = WASI-II VCI standard score, 3 = Friendship Expectation (FE) Companionship, 4 = FE Conflict, 5 = FE Help, 6 = FE Security, 7 = FE Closeness, 8 = FQS Companionship, 9 = FQS Conflict, 10 = FQS Help, 11 = FQS Security, 12 = FQS Closeness, 13 = FQS Total Score, 14 = Friendship Satisfaction, 15 = Global Self-Worth, 16 = Parent-Reported Quality of Life, 17 = Parent-Proxy Quality of Life.

* $p < .05$ ** $p < .01$, *** $p < .001$

Table 4

Summary of multiple linear regression analysis for variables predicting friendship satisfaction (Aim 1)

FQS Variable	Model Variables	Model 1			Model 2			Model 3		
		<i>B</i>	<i>SE</i> <i>B</i>	β	<i>B</i>	<i>SE</i> <i>B</i>	β	<i>B</i>	<i>SE</i> <i>B</i>	β
Total	FQS	3.17	.99	.41***	2.16	1.08	.28*	.47	1.46	.06
	Group				-2.37	1.20	-.28*	-16.35	8.43	-1.90*
	FQS x Group							3.54	2.11	1.55 [†]
	R ²		.17			.23			.27	
	Cohen's f^2		.20			.29			.36	
Companionship	FQS	2.02	.82	.33**	1.28	.83	.21	.78	1.26	.13
	Group				-2.84	1.16	-.33*	-6.09	6.38	-.71
	FQS x Group							.86	1.67	.36
	R ²		.11			.20			.21	
	Cohen's f^2		.12			.25			.27	
Conflict	FQS	-1.35	.77	-.24 [†]	-.54	.79	-.09	1.077	1.20	.19
	Group				-3.18	1.19	-.37**	2.20	3.30	.26
	FQS x Group							-2.71	1.56	-.81 [†]
	R ²		.06			.17			.22	
	Cohen's f^2		.06			.20			.28	
Help	FQS	1.88	.64	.38**	1.37	.64	.28*	.95	.94	.19
	Group				-2.71	1.12	-.32*	-5.83	5.16	-.68
	FQS x Group							.79	1.28	.35
	R ²		.15			.23			.24	
	Cohen's f^2		.17			.30			.32	
Security	FQS	1.82	.70	.34**	1.15	.72	.22	.35	.95	.07
	Group				-2.76	1.17	-.32*	-9.86	6.62	-1.15 [†]
	FQS x Group							1.86	1.44	.79
	R ²		.12			.20			.23	
	Cohen's f^2		.14			.20			.30	
Closeness	FQS	1.22	.95	.18	.60	.90	.09	-.27	1.32	-.04
	Group				-3.31	1.13	-.39**	-10.39	7.88	-1.21
	FQS x Group							1.62	1.79	.81
	R ²		.03			.17			.19	
	Cohen's f^2		.03			.20			.23	

[†]p < .10 *p < .05 **p < .01 ***p < .001

Table 5

Summary of multiple linear regression analysis for variables predicting friendship satisfaction for children with ASD (Aim 2)

FQS/FE Variable	Model Variables	Model 1			Model 2			Model 3		
		<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Companionship	FQS	1.65	1.43	.24	1.69	1.43	.25	2.57	4.68	.38
	FE				-0.18	.14	-.10	.16	1.64	.10
	FQS x FE							-.10	.51	2.08
	R ²		.06			.07			.07	
	Cohen's f^2		.06			.08			.08	
Conflict	FQS	-1.63	1.30	-.26	-1.51	1.32	-.24	.55	3.01	.09
	FE				0.16	.34	.10	1.00	1.15	.62
	FQS x FE							-0.33	.44	-.59
	R ²		.07			.08			.10	
	Cohen's f^2		.08			.09			.11	
Help	FQS	1.74	1.15	.32	2.61	1.22	.47*	2.34	3.81	.42
	FE				-.46	.30	-.34	-.56	1.42	-.42
	FQS x FE							.03	.38	.11
	R ²		.10			.19			.19	
	Cohen's f^2		.11			.23			.23	
Security	FQS	2.20	1.40	.32 [†]	3.51	1.39	.52**	7.92	4.18	1.17*
	FE				-.76	.33	-.46*	.93	1.55	.57
	FQS x FE							-.49	.44	-1.44
	R ²		.11			.28			.32	
	Cohen's f^2		.12			.39			.47	
Closeness	FQS	1.35	1.59	.18	1.05	1.43	.14	4.22	5.53	.57
	FE				1.00	.44	.44*	2.53	2.62	1.12
	FQS x FE							-.38	.65	-.84
	R ²		.03			.23			.24	
	Cohen's f^2		.03			.30			.32	

Note. FE = Friendship Expectations

[†] $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

Table 6

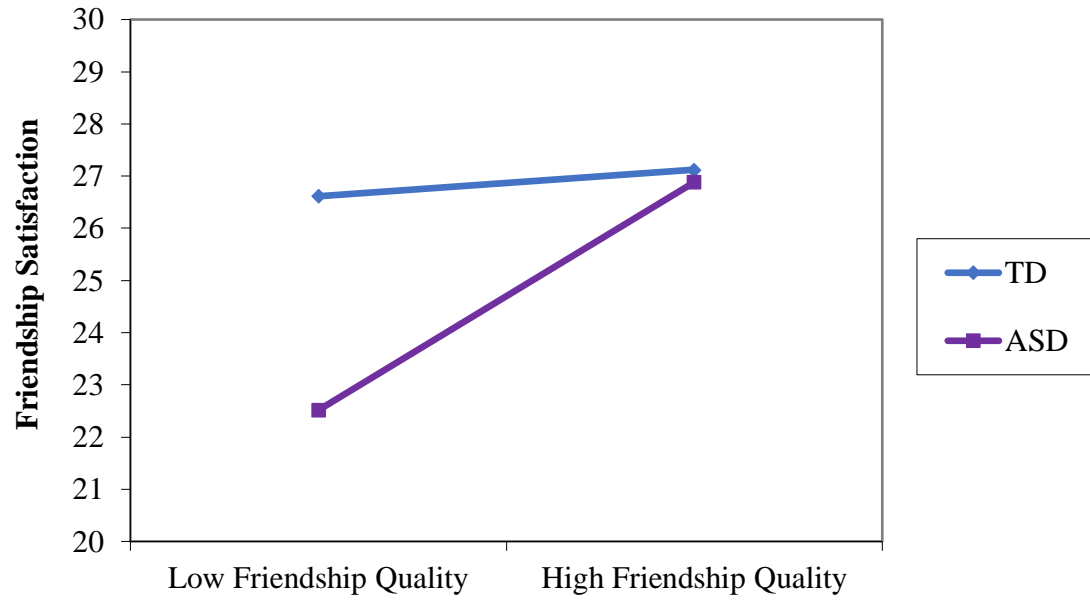
Summary of multiple linear regression analysis for variables predicting child well-being (Aim 3)

FQS/FE Variable	Model Variables	Model 1			Model 2			Model 3		
		<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Global Self-Worth	VCI	.01	.01	.08	.01	.01	.12	.01	.01	.09
	FQS	.14	.14	.14	.17	.14	.14	.07	.18	.08
	Sat	.01	.02	.07	.01	.02	.17	.03	.04	.26
	Group				.12	.16	.15	.04	1.42	.04
	FQS x Gr							.26	.29	.94
	Sat x Gr							-.04	.04	-.86
	R ²		.05			.06			.08	
	Cohen's <i>f</i> ²		.05			.06			.09	
Parent-Rated Quality of Life	FQS	7.07	5.00	.19	-.91	3.70	-.02	6.81	4.36	.18
	Satisfaction	1.38	.66	.29*	.45	.50	.09	-1.01	.82	-.21
	Group				-30.18	3.98	-.73***	-32.37	3.68	-.78***
	FQS x Gr							-20.68	6.85	-.36**
	Sat x Gr							2.63	.97	.45**
	R ²		.16			.58			.67	
	Cohen's <i>f</i> ²		.19			1.38			2.03	
Parent-Proxy Quality of Life	FQS	8.08	4.85	.22 [†]	1.39	3.96	.04	5.00	5.13	.14
	Satisfaction	1.11	.64	.24 [†]	.35	.51	.08	-.30	.92	-.07
	Group				-25.24	4.31	-.64***	-18.48	37.75	-.47
	FQS x Gr							-9.59	7.99	.75
	Sat x Gr							1.21	1.11	-.92
	R ²		.15			.47			.49	
	Cohen's <i>f</i> ²		.18			.89			.96	

[†]p < .10 *p < .05 **p < .01 ***p < .001

Figure 1

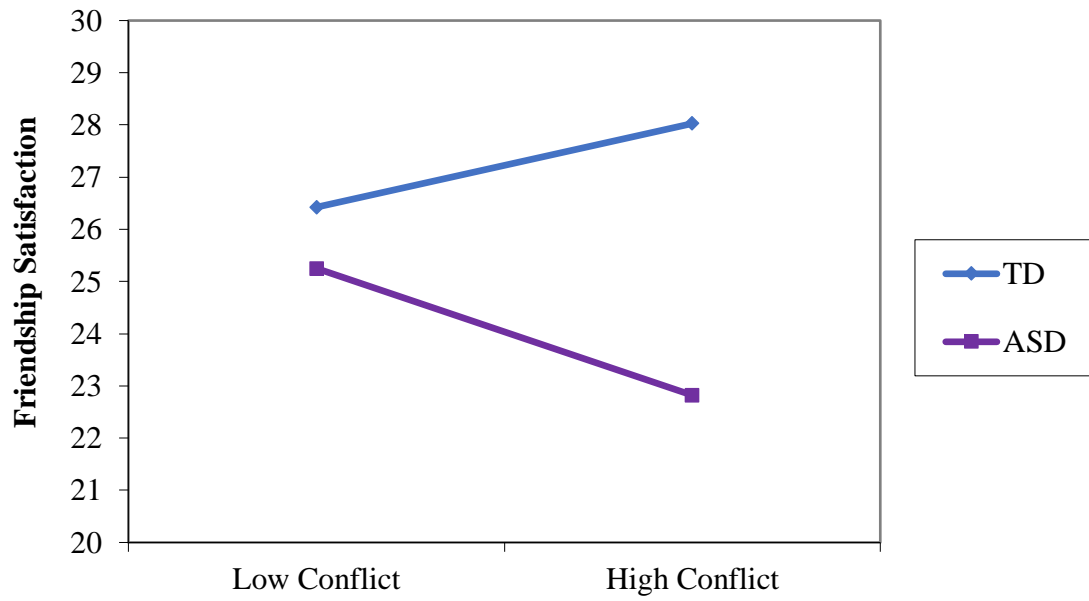
Interaction between FQS total score and diagnostic group on friendship satisfaction



Note. The interaction term was marginally significant. Only the simple slope for the ASD group was significant.

Figure 2

Interaction between FQS conflict score and diagnostic group on friendship satisfaction

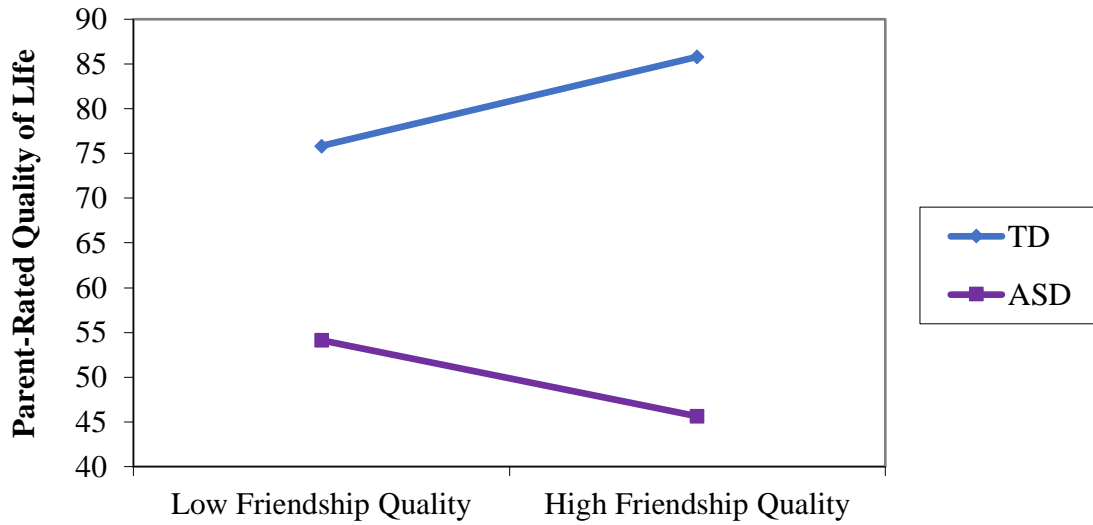


Note. The interaction term was marginally significant. Only the simple slope for the ASD group was significant.

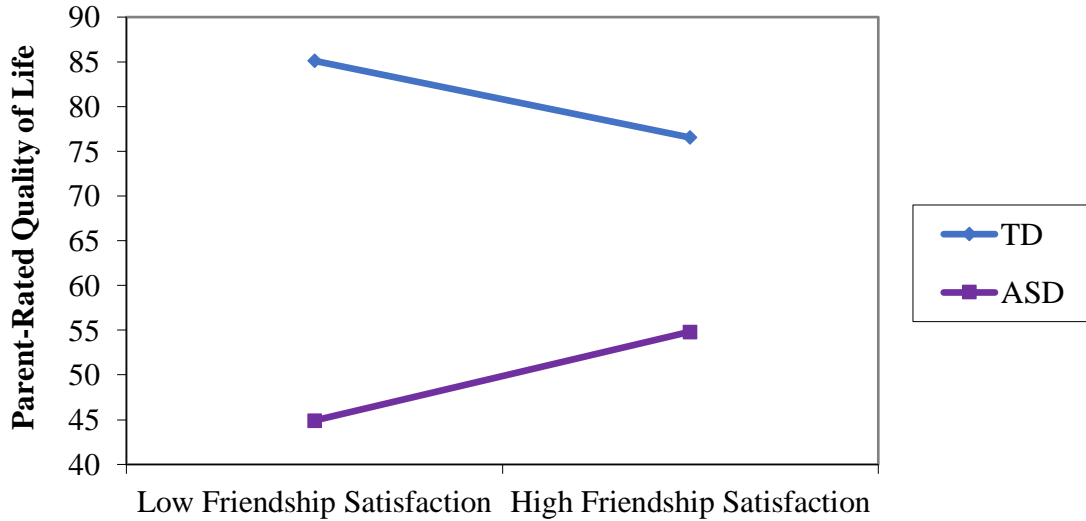
Figure 3

Interactions between friendship variables and diagnostic group on quality of life

(a) Interaction between friendship quality and diagnostic group on quality of life



(b) Interaction between friendship satisfaction and diagnostic group on quality of life



Note. For both interaction effects, only the simple slope for the ASD group was significant.

APPENDIX A

ITEM TEXT COMPARISON OF FRIENDSHIP QUALITIES SCALE AND FRIENDSHIP EXPECTATION MEASURE

Domain of Items	Friendship Qualities Scale (FQS) Items (Bukowski et al., 1994)	Friendship Expectations Items ("Friends should...")
Companionship	My friend and I spend all our free time together.	Spend time together
	My friend thinks of fun things for us to do together.	Do fun things together
Conflict ^a	I can get into fights with my friend.	Not get into fights
	My friend and I disagree about many things.	Agree about many things
Help	My friend helps me when I am having trouble with something.	Help each other
	My friend would stick up for me if another kid was causing me trouble.	Stick up for each other
Security	If I have a problem at school or at home, I can talk to my friend about it.	Talk about their problems
	If my friend and I have a fight or argument, we can say "I'm sorry" and everything will be alright.	Say sorry after a fight
Closeness	I feel happy when I am with my friend.	Feel happy when together
	Sometimes my friend does things for me, or makes me feel special.	Show they care for each other

^a Friendship Expectation item content in conflict domain is reversed from FQS items to put expectation in a positive direction consistent with other expectation domains.

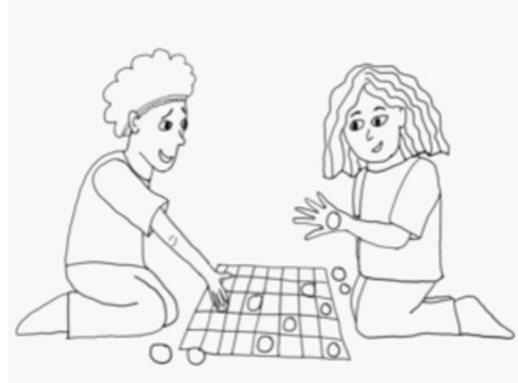
APPENDIX B

FRIENDSHIP EXPECTATION MEASURE SAMPLE ITEMS

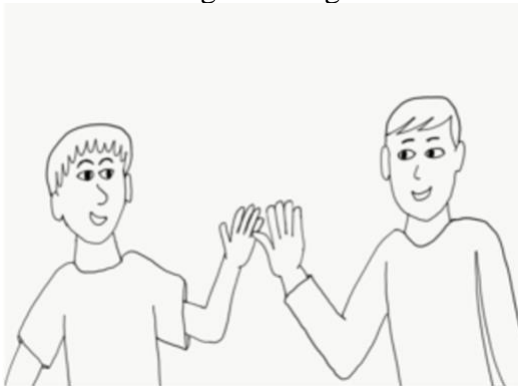
Spend time together



Do fun things together



Not get into fights



Agree about many things



Help each other



Stick up for each other



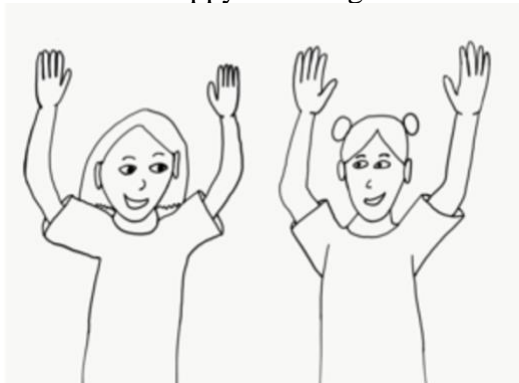
Talk about their problems



Say sorry after a fight



Feel happy when together



Show they care for each other



APPENDIX C

NEW FRIENDSHIP SATISFACTION MEASURE ITEMS

1. I wish my best friend treated me differently

Not at all True A Little True Somewhat True Pretty True Really True

2. There are things I don't like about my friendship with my best friend

Not at all True A Little True Somewhat True Pretty True Really True

3. I am satisfied with my friendship with my best friend

Not at all True A Little True Somewhat True Pretty True Really True

4. I wish my friends treated me differently

Not at all True A Little True Somewhat True Pretty True Really True

5. There are things I don't like about my friendships

Not at all True A Little True Somewhat True Pretty True Really True

6. I am satisfied with my friendships

Not at all True A Little True Somewhat True Pretty True Really True

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