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social sciences



Article

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Article

Characterizing Parent–Child Interactions in Families of Autistic Children in Late Childhood

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Abstract: Parent–child interactions are influential to a wide range of positive developmental processes in neurotypical children, yet contributions to our understanding of these interactions using observational methods in families of children on the autism spectrum are lacking. The aim of the current study is to investigate how autism symptoms might impact these interactions. We use a family discussion task to: (1) compare families of autistic children aged 8–12 years ($n = 21$) to families of typically developing children ($n = 21$, matched on age and cognitive abilities) on the observed levels of supportive and directive behaviors in the parent–child relationship, and (2) examine the associations between parent–child interaction characteristics and child functioning. Results showed no differences in the observed levels of supportive behavior exhibited by parents, but significantly less supportive behavior in autistic children compared to neurotypical children. In addition, parents of autistic children had higher levels of observed directive behavior compared to parents of neurotypical children. Levels of supportive behavior in parents and autistic children were negatively associated with child ADHD symptoms. Findings reinforce literature on younger children describing positive parenting characteristics and further rebuke historical accounts of negative parenting qualities of parents of autistic children.

Keywords: parent–child interactions; autism spectrum disorder; late childhood; mental health



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1. Introduction

The 21st century has seen significant advancements in understanding how to best support autistic individuals (a preferred term by autistic adults and parents, see [Kenny et al. \(2015\)](#)), yet, apart from intervention research, there has been surprisingly little research devoted to understanding the characteristics of social support that parents provide. Autistic individuals experience social communication difficulties that are evident across development ([American Psychiatric Association 2013](#)), and starting in the late 20th century, we developed evidence-based interventions that help improve social, communication, and adaptive skills. By the 21st century, many behavioral interventions occurred in the family home, and some began shifting their focus to training parents as mediators of these interventions (e.g., [Nevill et al. 2018](#); [Pickles et al. 2016](#)). Many parents of autistic children have become experts on their children's developmental strengths and challenges, how to manage difficult behaviors, and how to advocate for their children to receive appropriate services. Parents have gained new tools and a better understanding of autism, but how these multiple parenting roles might affect parent–child interactions is unclear. Parents may have gained better insight into the needs of their children, perhaps increasing opportunities and exhibitions of supportive behavior, or perhaps their increased managerial parenting roles might challenge or change the types of support they display. In the current study, we investigate whether families of autistic children can be characterized similarly to families of neurotypical youth in late childhood (ages 8 to 12). This will help us advance our fundamental knowledge of parent-child interactions just prior to adolescence. In

addition, our study is unique in using observation methods to study interactions during late childhood; observational methods have previously been used only in families with autistic children under age 5 (e.g., [Blacher et al. 2013](#)). We also investigate how these patterns are related to child characteristics and functioning. This study has the potential to help parents gain insights on how they provide support to their autistic children and may help service providers gain insights on how to better scaffold parent behaviors in consideration of the impact on parent–child relationships.

1.1. Theoretical Considerations in the Study of Families of Children on the Autism Spectrum

In the 21st century, research has extensively documented several impacts that autism has on family functioning, much of which concludes with urgent considerations for parents' mental health. Particularly, parents of autistic children are more likely to report feeling more parenting stress than parents of neurotypical youth and parents of children with other developmental delays, such as Down syndrome (e.g., [Abbeduto et al. 2004](#); [Estes et al. 2009](#); [Bristol and Schopler 1983](#)). The reasons for increased stress compared to other families of children with developmental disabilities is unclear, but guilt in the context of the historical precedent of blame on parents for causing autism ([Kuhn and Carter 2006](#)), a lower frequency of rewarding behaviors exhibited by autistic children, such as smiling and laughing with parents ([Kasari et al. 1990](#)), and the presence of challenging behaviors associated with autism ([Lecavalier et al. 2006](#)), have all been proposed as potential mechanisms for increased stress.

Much of the contemporary literature on families of autistic children describes how autism influences parent mental health and family routines. However, we need more data on how autism symptoms or the symptoms of associated conditions, such as anxiety or ADHD symptoms, might influence family processes, such as the quality of parent–child relationships or parent–child interactions. The social communication symptoms central to autism are manifested as limited joint engagement, eye contact, imitation, and/or interest in social play routines in children under 5. In later childhood, adolescence, and adulthood, these symptoms can also include difficulties understanding and relating to emotions, engaging in reciprocal interactions, and/or relating to the points of view of others. Some of these symptoms are related to challenges parents experience when interacting with their children. For example, autistic children display less effective communication and fewer expressions of enjoyment with their parents ([Beurkens et al. 2013](#)) and have fewer positive emotions and more negative emotions as reported by parents ([Capps et al. 1993](#); [De Pauw et al. 2011](#)). Some of these difficulties may influence the development of less positive parent–child interaction characteristics and relationships. Parents might feel discouraged after their repeated attempts to foster engagement during interactions which do not lead to displays of positive affect in their children, which may result in increased displays of negativity from a parent. In turn, their children may respond to these changes in parent behavior by displaying more challenging behaviors, creating a negative recursive pattern within the relationship. Yet, research on attachment demonstrated that the attachment relationship between parents and younger children is not affected much by autism symptoms. Young autistic children displayed more comfort-seeking behaviors and physical contact with their parents after separations than with strangers, and most autistic children did not differ from children with other developmental disorders in terms of behavioral evidence of secure or insecure attachment classifications ([Capps et al. 1994](#); [Sigman and Ungerer 1984](#); [Rogers et al. 1991](#)), although a minority do not react to separation from or reunion with caregivers ([Grzadzinski et al. 2014](#)).

While autism symptoms do not appear to impact attachment for most children, there remains a concern that increased parenting stress itself can lead to negative interaction patterns later in development. Similar to the mechanism by which economic stress undermines a parent's ability to maintain positive interactions with neurotypical children (see [Masarik and Conger 2017](#)), some of the behavioral challenges exhibited by autistic children may undermine parent coping skills and supportive behavior across time ([Schiltz](#)

et al. 2018). Over time, the behavioral challenges have the potential to develop coercive cycles of parent–child interactions, in which parent and child behaviors have been shaped into stable patterns of negativity, see *Patterson* (1982). As an example, longitudinal studies have demonstrated that parents of autistic children report increases in negative controlling behavior on days when they feel more parenting stress or after their children display high levels of externalizing behaviors, but this increased negative control is also related to more negative child adjustment and parent functioning (*De Clercq et al.* 2021; *Dieleman et al.* 2017, 2019). These findings highlight critical challenges for parents, but we need to understand the parent–child interaction beyond parent reports of relationship quality and parenting behaviors via questionnaires.

1.2. The Function of Parent–Child Interactions in Late Childhood

In late childhood, neurotypical children are increasingly able to get support from caregivers who are emotionally, but not always physically, present (*Bosmans and Kerns* 2015). Warmth and support in the parent–child relationship has been associated with fewer externalizing behaviors (*Goldstein et al.* 2005; *Rothenberg et al.* 2020), attenuated relations between peer stressors and depressive symptoms (*Healy and Sanders* 2018; *Stice et al.* 2004), and improved peer relationships (*Flynn et al.* 2018). In families characterized by low levels of warmth or high degrees of hostility, neurotypical adolescents engage with more deviant peers (*Benson and Buehler* 2012) and are at risk of the development of anxiety and depression (*Lippold et al.* 2021; *Sturge-Apple et al.* 2006). Neurotypical children benefit from having supportive parents with whom they can freely discuss problems, but who also help them make and enact their own decisions, which is known as “psychological autonomy-granting” (*Benito-Gomez et al.* 2020; *Steinberg* 2001).

Can we describe a sensitive and supportive parent of an autistic child similarly to sensitive parents of neurotypical youth in late childhood? Supportive behavior, evidenced by warmth and responsiveness, is universally beneficial for children’s development. In research on autism, studies have demonstrated robust longitudinal associations between supportive parenting and positive adjustment for autistic children (*De Clercq et al.* 2019). However, how much should parents of autistic children emphasize psychological autonomy in the context of the parent–child relationship? Parental directive behaviors are attempts to shape children’s behaviors or to increase compliance (*Ispa et al.* 2013). These behaviors might seem intrusive to neurotypical children’s autonomy, but may be appropriate for autistic children. Autistic children may need more direct instruction from parents on skills necessary for autonomy in late childhood, such as social and self-regulatory skills, compared to neurotypical children. *Freeman and Kasari* (2013) found that increased directive behaviors from parents, taught in the context of early intervention, resulted in increased joint engagement in younger autistic children during play. However, very little is known about the appropriateness or characteristics of directive behaviors for older autistic children, and it may be the case that high levels of parent directive behavior could limit opportunities for learning independence. Likely, there are variations from family to family that could be influenced by the severity of autism symptoms or symptoms of co-occurring conditions, such as ADHD, and we might expect higher levels of these symptoms to elicit increased directive behaviors in parents as they try to maintain a social interaction.

1.3. Current Study

There have been limited attempts to assess the parent–child interactions or relationships in families of autistic children outside of early childhood. Some studies have employed questionnaires, (e.g., *Chandler and Dissanayake* 2014; *Maljaars et al.* 2014; *De Clercq et al.* 2019), and several other studies have used the Five Minute Speech Sample (FMSS; e.g., *Smith et al.* (2008)), in which a parent describes their child uninterrupted for five minutes (*Magaña et al.* 1986). The FMSS is typically used to measure parent levels of expressed emotion, which consists of critical, hostile, or emotionally over-involved attitudes, and is a metric of an adverse family environment. The FMSS can also be coded for parental warmth,

consisting of positive and supportive statements about their children. While questionnaires can help to establish how both parents and children perceive their relationship, they can be biased and are limited portrayals of relationships. In addition, the FMSS, with a long history of use in psychiatric populations, offers a rich description of parent emotions in the context of the parent–child relationship, but does not allow for conclusions to be drawn about how parents and children interact. Using the FMSS (Magaña et al. 1986), studies have consistently found that mothers of autistic adolescents have high levels of warmth and praise and low levels of criticism when discussing their children, and that warmth is related to reductions in co-occurring externalizing and internalizing symptoms (Greenberg et al. 2006; Smith et al. 2008). However, as the FMSS is coded from parent interviews, there are concerns that these interviews can be biased in studies of autism or other developmental disabilities (Benson et al. 2011).

Observations of parent–child interactions are ideal for capturing both child and parent behavior in the context of the relationship (Acock et al. 2005). One observational measure used in neurotypical populations and in populations at risk for depression is the Iowa Family Rating Scales (IFIRS) (Melby et al. 1998). This rating scale, which is used to code a structured parent–child discussion task, can provide measures of parent and child interactive behaviors, including supportive behavior and directive behavior.

This study uses the IFIRS to examine interaction patterns across parents of neurotypical and autistic children. We posed three main research questions: (1) Do parent–child interaction characteristics differ between families of neurotypical and autistic children in late childhood when measured using the observer-based IFIRS coding? (2) Is there concordance between child and parent interaction characteristics during the discussions? (3) How do interaction characteristics relate to child autism symptoms and symptoms of co-occurring conditions within families who have autistic children?

For our first research question, we hypothesize there will be minimal differences in levels of support and warmth between parents of neurotypical youth and parents of autistic youth based on previous research showing minimal to no differences on parent behavior using observational methods in children under 5 (Blacher et al. 2013). We hypothesize that autistic children would display less overall supportive behavior compared to neurotypical children (e.g., Beurkens et al. 2013). We also hypothesize that parents of autistic children would display more directive behaviors compared to parents of neurotypical children due to increased need for scaffolding during a structured activity. Together, these data would provide rich contemporary data on the interaction characteristics of families of autistic children in late childhood.

For our second research question, we hypothesize that parent and child characteristics within families would be positively correlated, based on past evidence in intervention studies (Solomon et al. 2008). These associations represent a potential opportunity to promote social skill development—if parent and child values are associated, promotions of parent levels of supportive behavior can hopefully lead to increased displays of child levels of supportive behavior.

For our third research question, we hypothesize there to be negative associations between elements of supportive behavior in parent–child interactions and symptoms of autism, anxiety, depression, and ADHD, based on research on adolescents (Greenberg et al. 2006; Smith et al. 2008). Finally, we hypothesize that parent directive behavior will be positively associated with elevated symptoms of autism and co-occurring conditions, including depression, anxiety, and ADHD in children. Although cross-sectional, these associations may suggest either a need for increased scaffolding, or alternatively suggest there may be consequences to high degrees of parental directive behavior in autistic childhood at this point in development.

2. Method

2.1. Participants

Participants for this study were recruited as part of an ongoing study examining language, social, and cognitive functioning in autistic children and neurotypical children. Children aged 8 to 12 were recruited into the study if their parents reported either a previous diagnosis of autism or no known psychiatric disorder, and if their parents reported adequate verbal abilities for the assessment battery (e.g., can have a conversation with peers). Participants were recruited from the research clinic at the UC Davis MIND Institute, community education events, and local schools.

After enrollment into the study, the diagnosis of autism was confirmed by clinicians using the Autism Diagnostic Observation Schedule, 2nd edition (ADOS-2) (Lord et al. 2012), and further supported by parent ratings on the Social Communication Questionnaire (Rutter et al. 2003). In addition, children were included in the study if their standard score on the General Conceptual Ability was above 70, measured by the Differential Ability Scales, Second Edition (DAS-II) (Elliott 2007).

The current study consists of 42 subjects (21 with confirmed diagnosis of autism, 21 with neurotypical development) matched on age and general intellectual abilities measured by the DAS-II (See Table 1 for a summary of subject and family demographic information). Participants were mostly boys at a 1:4–1:5 ratio, reflective of the proportions of boys to girls diagnosed with autism in the US (Baio et al. 2018). In addition, there were no significant differences between groups on family living situation, family marital status, or annual family income. This research was conducted in compliance with the Institutional Review Board and written consent and assent were obtained from parents and participants at each visit.

Table 1. Child and Family Demographics.

	Autism (<i>n</i> = 21)	Neurotypical (<i>n</i> = 21)	<i>p</i> -Value
Males (%)	18 (86%)	20 (95%)	0.37
Chronological Age (SD)	10.10 (1.40)	10.42 (1.37)	0.46
DAS-II Verbal (SD)	102.57 (22.73)	108.67 (11.27)	0.28
DAS-II Nonverbal (SD)	98.71 (18.90)	101.00 (10.41)	0.63
DAS-II GCA (SD)	102.24 (18.78)	107.86 (11.60)	0.25
ADOS-2 CSS	6.52 (1.60)	NA	
Race/Ethnicity (%)			
Hispanic/Latino	2 (9.5%)	2 (9.5%)	
Asian	0 (0%)	2 (9.5%)	
Black/African American	3 (14.3%)	3 (14.3%)	
Native Hawaiian/Pacific Islander	1 (4.8%)	1 (4.8%)	
Caucasian	19 (90%)	17 (81%)	
Other	3 (14.3%)	2 (9.5%)	
Missing	1 (4.8%)	2 (9.5%)	
Mothers in Task (%)	20 (95.2%)	20 (95.2%)	
Child Living with Both Biological Parents (%)	15 (71.4%)	15 (71.4%)	
Parents Married (%)	16 (76.2%)	15 (71.4%)	
Annual Family Income (%)			

Table 1. *Cont.*

	Autism (<i>n</i> = 21)	Neurotypical (<i>n</i> = 21)	<i>p</i> -Value
Under \$30 K	1 (4.8%)		
\$30–\$49 K	3 (14.3%)		
\$50–\$74 K	3 (14.3%)		
\$75–\$99 K	2 (9.5%)		
\$100–\$ 149 K	6 (28.6%)		
Over \$150 K	5 (23.8%)		
Missing	1 (4.8%)		

Note: DAS-II = Differential Ability Scales, Second Edition, ADOS = Autism Diagnostic Observation Schedule, CSS = Calibrated Severity Score. Participants were allowed to select multiple race and ethnicity choices. *p*-values represent significance from independent samples *t*-tests for continuous variables. Mothers in Task describes the percentage of parents observed interacting with their children who were mothers of the participants (the remaining parents who were observed were biological fathers).

2.2. Procedure

Children and one of their parents (over 95% were mothers) came to the laboratory to complete a battery of cognitive, language, diagnostic measures, and questionnaires. Parents completed questionnaires while standardized assessments were administered to children. In addition, the parent and child were brought to a comfortable room with couches and a table where they were videotaped engaging in a structured discussion. Parents and children sat at a table near each other and were given a set of 28 cards to read and were asked to discuss the questions on the cards and continue talking until the examiner returned in 25 min. The cards contained topics such as chores, discipline, friends, and emotional events within the past year.

2.3. Measures

Each of the structured discussions was videotaped and coded using the Iowa Family Interaction Rating Scales (IFIRS) (Melby et al. 1998), which focus on the frequency and intensity of observable behaviors from each member of the dyad towards the other. Both verbal and nonverbal behaviors were considered for each code. Three coders received 20 h of training and needed to achieve 90% absolute agreement on five training videos before coding the current data set. To assess inter-rater reliability, 25% of the discussions were randomly selected to be coded by a second rater. In addition, reliability was assessed on videos when the main coder had questions or concerns about the determination of the behavior. In the current study, observed inter-rater reliability was adequate (mean ICC value = 0.86).

IFIRS: Supportive Behavior. Supportive behavior is a composite variable of seven scales from the IFIRS which were previously used in longitudinal examinations on family processes (Ackerman et al. 2011; Kim et al. 2001; Dinero et al. 2008). The scales used were warmth/support, communication, listener responsiveness, and prosocial, hostility (reverse coded), angry coercion (reverse coded), and antisocial (reverse coded). Warmth/support describes expressions of concern, empathy, or appreciation between family members. Communication describes how effectively partners convey ideas. Listener Responsiveness describes partner attentiveness and the ability to express interest. Prosocial describes cooperative and helpful behaviors. Hostility was coded as hostile, disapproving, rejecting, and critical behavior expressed towards the other family member. Angry coercion was indicated by behaviors that attempt to control or change the other family member's behavior with threats, blame, or hostile behaviors. Antisocial was indicated by behaviors that were self-centered, defiant, insensitive, or resistant. These scales are rated on a 9-point scale ranging from 1 (not at all characteristic) to 9 (mainly characteristic) separately for both family members by accounting for the frequency and intensity of the behaviors observed. They were averaged to compute the composite variable. Although the scales used can be separated into positive and negative interaction characteristics, we elected to combine these aspects of the interactions to produce a positive-oriented scale following the procedures

of past literature (e.g., [Dinero et al. 2008](#)), and due to the results of the exploratory factor analyses. The composite scale of supportive behavior had adequate internal consistency (parent $\alpha = 0.80$; child $\alpha = 0.87$).

IFIRS: Directive Behavior. Directive behavior is a composite variable of two scales from the IFIRS: dominance and lecture/moralize. Past research has defined a parent 'control' variable generated from the IFIRS dominance scale (e.g., [Anderson et al. 2015](#)), but we included the lecture/moralize scale in our directive behavior composite due to the conceptual similarities between the two scales. Dominance was coded as behaviors that served to control, influence, or dominate the opinions, actions, or points of view of others during the interactions. Lecture/Moralize was coded as the degree to which individuals presented information to partners in an intrusive, didactic, or overly pushy manner that did not allow for constructive conversation. The composite variable of directive behavior had adequate internal consistency ($\alpha = 0.69$) but was just under the commonly used value for desirable reliability of 0.70.

Child Functioning. To assess child maladaptive behaviors and social problems, parents completed the Child Behavior Checklist (CBCL) for school-aged children ([Achenbach and Rescorla 2001](#)). The CBCL is a measure of child behavioral problems and functioning. This study uses three of the available scales from the CBCL designed for children aged 6 to 18: Anxiety Problems, Depression Problems, and Attention Deficit Hyperactivity Disorder (ADHD) Problems. These scales were developed according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) diagnostic criteria for anxiety, depression, and ADHD. These scales are scored via a computer scoring program to produce standard scores and have adequate internal consistency (Anxiety: $\alpha = 0.79$, Depression: $\alpha = 0.81$, ADHD: $\alpha = 0.85$). The CBCL has been frequently used and validated in samples of autistic children (e.g., [Havdahl et al. 2016](#)).

Autism symptoms were assessed by a licensed clinical psychologist using the ADOS-2 ([Lord et al. 2012](#)). The clinical psychologist was certified as research reliable on the administration and scoring of the ADOS-2. The ADOS-2 is a semi-structured assessment between a clinician and a child consisting of a variety of different observational tasks the child is asked to participate in. It is widely considered the most valid and objective assessment of the autism diagnosis and it produces two domain scores, Social Affect and Restrictive and Repetitive Behavior, and a Calibrated Severity Score. Social Affect describes the extent to which a child has social-communication difficulties, such as the lack of appropriate social responses. Restrictive and Repetitive Behavior is characterized by the presence of abnormal sensory or motor behavior (e.g., hand flapping), or a child's discussion of a circumscribed interest at length. The Calibrated Severity Score yields a measure of autism spectrum-related symptoms that can be used to compare children with similar language skills and age. Within the current study, all children in the ASD group received the ADOS-2, Module 3. All children who were recruited as part of the autism group met the criteria for ASD on the ADOS-2. Children recruited into the neurotypical group were not administered the ADOS-2.

2.4. Data Analysis

Exploratory Factor Analysis on IFIRS Codes. Previous research has used composite scores and single-scale scores from the IFIRS (e.g., [Anderson et al. 2015](#); [Dinero et al. 2008](#)) that were identified using factor analysis in samples consisting of families that did not have children on the spectrum. Due to slight changes in our scale composites and a different population, exploratory factor analyses were conducted on the IFIRS codes for parents and children separately to validate our selection of composite scores. The Kaiser–Meyer–Olkin (KMO) test of sampling adequacy (parents, KMO = 0.81; children, KMO = 0.79) and Bartlett's test of sphericity (parents, $\chi^2(36) = 305.31$, $p < 0.001$; children $\chi^2(36) = 243.78$, $p < 0.001$) both indicated the adequacy of the factor model for the samples ([Gorsuch 1990](#)). Principal axis factoring was applied to 8 scales for each parent and each child. Examination of the scree plot led us to retain 2 factors for parents (explaining 77% of the total variance)

and 2 factors for children (explaining 71% of the total variance). Oblimin rotation was used as there was reason to expect that the factors could be correlated. Due to the small sample, factor loadings above 0.5 were used in the interpretation of the factor output (Stevens 1992). The results for both parent and child data revealed similar factor structures (see Supplementary Table S1). For both parent and child data, the supportive behavior factor consisted of high positive loadings for warmth, communication, listener responsiveness, and prosocial scales and high negative loadings for hostility, angry coercion, and antisocial scales. The directive behavior factor consisted of high positive loadings for the dominance and lecture/moralize scales.

Supportive Behavior Comparisons. Multilevel modeling was used to examine the comparisons between patterns of supportive behavior between parents or children by diagnostic group. The data were coded to identify family members within dyads (parent or child) for estimation as a fixed effect, and each dyad was given a unique numerical identifier that was applied to both individuals to be estimated as a random effect. Diagnostic group (autism or neurotypical) was also estimated as a fixed effect. The interaction between the fixed effect of family member and diagnostic group was then examined to explain the variance of supportive behavior coded from the IFIRS. To be conservative with the small sample size, the degrees of freedom were approximated using the Kenward–Roger adjustment. Due to the high levels of observed right skewness in the supportive behavior composite, the model was fitted to a gamma distribution, using the following equation using PROC GLIMMIX in SAS 9.4:

$$\text{SuppBeh}_{ij} = b_0i + b_1i \times \text{Diagnostic Group}_{ij} + b_2ij \times \text{Person}_{ij} + b_3i \times \text{Diagnostic Group}_i \times \text{Person}_{ij} + \varepsilon_{ij}$$

where Diagnostic Group = 0 for neurotypical, 1 for autism for individual i in dyad j , Person = 0 for Parent, 1 for Child.

Directive Behavior Comparisons. We used an ANOVA to examine diagnostic group differences on directive behavior exhibited by parents. To consider the likelihood of child interaction characteristics accounting for this group difference, we ran an ANCOVA including child supportive behavior as a covariate.

Associations with Child Functioning. We first compared the mean levels of anxiety, depressive, and ADHD problems between autistic and neurotypical children using t -tests. Pearson correlations were used to test the associations between the family interaction characteristics and child functioning variables. One participant did not fully complete the questionnaires and was excluded from the correlation analyses examining the associations between interaction characteristics and child characteristics. All data analyses were conducted using SAS, Version 9.4 (SAS 9.3) and SPSS, Version 25.

3. Results

3.1. Do Parent–Child Interaction Characteristics Differ by Diagnostic Group?

Supportive Behavior. Table 2 contains the means on the two IFIRS composite variables by family member and diagnostic group. There was a significant interaction between the fixed effect of family member and diagnostic group ($F(1,40) = 11.69$, $MSE = 0.05$, $p = 0.001$). The mean level of observed supportive behavior was significantly lower in autistic children as compared to parents of autistic children ($t(40) = -5.12$, $p < 0.001$, $d = -2.19$), neurotypical children ($t(69.01) = -2.76$, $p = 0.007$, $d = -1.44$), and parents of neurotypical children ($t(69.01) = -2.98$, $p = 0.004$, $d = -1.67$). There was no significant difference between parents of autistic children and parents of neurotypical children ($p = 0.30$), and there was no significant difference between the means of parents of neurotypical children and neurotypical children on the levels of supportive behavior ($p = 0.59$).

Table 2. Child and Parent IFIRS Composite Means by Diagnostic Group.

IFIRS Composite	Autistic Youth	Parents of Autistic Youth	Neurotypical Youth	Parents of Neurotypical Youth
Supportive Behavior	6.48 (1.42) ^{a,b,c}	7.99 (0.78) ^a	7.48 (0.87) ^b	7.63 (1.40) ^c
Directive Behavior	-	4.60 (1.82) ^g	-	3.48 (1.61) ^g

Note: Matched letters denote significant pairwise differences from univariate multilevel models ($p < 0.05$).

Directive Behavior. Parents of autistic children had higher observed levels of directive behavior than parents of neurotypical children ($F(1,40) = 4.45$, $MSE = 2.95$, $p = 0.04$, $d = 0.65$). The diagnostic group difference was significant after including child supportive behavior as a covariate: $F(1,39) = 4.69$, $MSE = 2.80$, $p = 0.04$, $d = 0.62$.

Associations between Parent and Child Interaction Characteristics. Within both diagnostic groups, there was a strong positive correlation between child and parent supportive behavior (Autism: $r(19) = 0.54$, $p = 0.01$; Neurotypical: $r(19) = 0.49$, $p = 0.02$). There was no significant relation between child supportive behavior and parent directive behavior in either group (Autism: $r(19) = -0.29$, $p = 0.21$; Neurotypical: $r(19) = -0.26$, $p = 0.25$).

3.2. Are Interaction Characteristics Related to the Characteristics of Children with ASD?

Table 3 contains the means and standard deviations of the child functioning variables for children on the autism spectrum and neurotypical children. Autistic children had higher levels of anxiety problems, depression problems, and ADHD problems, as measured by the CBCL.

Table 3. Means of Child Functioning Variables by Diagnostic Group.

	Autism	Neurotypical	<i>p</i> -Value
CBCL—Anxiety Problems	60.15 (9.18)	52.11 (3.29)	0.001
CBCL—Depression Problems	58.50 (8.59)	51.33 (1.94)	0.001
CBCL—ADHD Problems	65.50 (9.50)	53.11 (5.47)	<0.001

Note: CBCL = Child Behavior Checklist. All measures are parent-reported.

Child Characteristics and Parent Interaction Characteristics. Table 4 contains the correlation values between interaction variables and child functioning variables by family member. There were negative associations at a medium effect size between parent supportive behavior and ADHD problems ($r(18) = -0.37$, $p = 0.11$) and between parent supportive behavior and anxiety problems from the CBCL ($r(18) = -0.31$, $p = 0.18$), although neither was statistically significant. There was a significant relation between parent directive behavior and anxiety symptoms ($r(18) = 0.48$, $p = 0.03$).

Table 4. Pearson Correlations Between IFIRS and Characteristics of Children on the Autism Spectrum.

	Parent Supportive Behavior	Child Supportive Behavior	Parent Directive Behavior
ADOS-2 Total Score	0.07	-0.35	-0.19
CBCL Anxiety	-0.31	0.09	0.48 *
CBCL Depression	0.11	0.15	0.01
CBCL ADHD	-0.37	-0.49 *	-0.01

Note: ADOS-2 = Autism Diagnostic Observation Schedule; RRB = Repetitive and Restrictive Behaviors; CSS = Calibrated Severity Score; CBCL = Child Behavior Checklist. All measures parent-reported. * $p < 0.05$; $n = 20$.

Child Characteristics and Child Interaction Characteristics. There was a non-significant association with a medium effect size between the ADOS-2 total score and child supportive behavior ($r(18) = -0.35$, $p = 0.12$), indicating higher observed child supportive behavior was related to fewer autism symptoms, as rated by a clinician. In addition, there was a neg-

ative association between ADHD problems and child supportive behavior ($r(18) = -0.49$, $p = 0.02$).

4. Discussion

The 21st century has brought increased understanding of autism and evidenced-based treatments, but descriptive data on how autism might affect parent–child relationships in late childhood have been missing. While some of the challenges that parents of autistic children experience in their mental health have been explored, the current study expands upon our awareness of the support that parents provide their autistic children, and potential challenges they may face. Our aims were to (1) test whether parent–child interaction characteristics differ between families of neurotypical and autistic children in late childhood when coded from observations, (2) to investigate the concordance between child and parent characteristics, and (3) to examine how interaction characteristics relate to child autism symptoms and symptoms of co-occurring conditions.

There were no discernable differences between parents of autistic children and parents of neurotypical children in the levels of supportive behavior, a composite of positive oriented scales, such as warmth/support and listener responsiveness, and reverse coded negative oriented scales, such as hostility and angry coercion. These results resemble evidence from other studies finding no differences in the security of attachment, perceptions of parental availability, and positive parenting in families of autistic children compared to families of neurotypical children in middle to late childhood (e.g., [Chandler and Dissanayake 2014](#)). This pattern of results also echoes the historical and contemporary literature on parents of younger autistic children which has demonstrated only minor differences in the percentages of parent–child dyads with secure attachments as compared to families of neurotypical children (e.g., [Rogers et al. 1991](#); [Rutgers et al. 2007](#); [Teague et al. 2017](#)). The continuation of these findings into late childhood is a testament to the resiliency of parents of autistic children and their ability to foster positive developmental environments, often in the context of high levels of stress. Although empirical studies in the 20th century debunked the historical misconceptions that low levels of parental warmth might cause autism, colloquially known as the ‘refrigerator mother theory’, parents continue to feel stigmatized for their parenting behavior from community members and extended family members in terms of their parenting, especially when high amounts of externalizing symptoms are exhibited by their children ([Dale et al. 2006](#); [Gray 2002](#); [Neely-Barnes et al. 2011](#)). The current data offer a compelling portrayal of warmth, support, and responsiveness in parents of autistic children, and further rebuke historical misconceptions of low parenting quality in this population.

The symptoms of autism were not associated with parent supportive behavior. Theoretically, the symptoms of autism might complicate positive interaction patterns if they interfere with displays of engagement, reciprocity, and positive affect. In addition, many studies have documented high amounts of parenting stress in families of children on the autism spectrum, which could undermine a parent’s ability to positively engage over time. However, our data show that parents of autistic children had similar levels of supportive behavior to parents of neurotypical children, often in the presence of lower levels of supportive behavior exhibited by their children (although autistic children may display supportive behavior differently to their neurotypical peers). Supportive behavior was also strongly correlated between parents and children. This finding is consistent with studies that have employed observations of the parent–child dyad in families of autistic children. Increased parental positive affect through intervention has been associated with subsequent increases in children’s positive affect ([Solomon et al. 2008](#); [Siller and Sigman 2008](#); [Freeman and Kasari 2013](#)). If longitudinal evidence corroborates the reciprocating effects of supportive parent–child interaction characteristics, this evidence will further suggest that similar to interventions for younger autistic children (e.g., [Goods et al. 2013](#)), coaching supportive behaviors in parents may also be effective in augmenting children’s social behavior during late childhood.

Previous longitudinal studies on autistic adolescents have found bidirectional associations between indices of the parent–child relationship, as measured from the FMSS and mental health concerns, including internalizing symptoms, externalizing symptoms, and autism symptoms, (e.g., Orsmond et al. 2006; Smith et al. 2008; Woodman et al. 2015). Although limited due to our small sample size and the cross-sectional design, our correlation results support this past literature. We found that both parent and child supportive behavior was significantly associated with fewer ADHD symptoms rated by parents. This finding suggests that a child’s ability to regulate their attention may be associated with supportive characteristics of parent–child relationships. Perhaps, lower levels of warmth are exhibited by parents who are trying to get their child to focus on the structured discussion task. Alternatively, children with higher levels of ADHD symptoms may have difficulties attending to and communicating with their parent in a structured discussion, which would negatively impact the frequency of supportive behaviors children exhibit. In addition, our results resemble past research that has found that ADHD symptoms can increase negativity in the parent–child relationship in children without autism (e.g., Lifford et al. 2008) and, therefore, suggest similar mechanisms are plausible in families of autistic children. Future studies should examine parent–child interactions across structured and unstructured tasks to obtain a more holistic picture of these characteristics in late childhood.

Within our sample, there were significantly higher levels of directive behavior in parents of autistic children compared to parents of neurotypical children. Higher levels of parent directive behavior were associated with higher levels of child anxiety problems, but not depression, for children on the autism spectrum. This finding is preliminary and future studies are needed to understand the temporal relationship between anxiety symptoms and parent directive behavior. Past literature on neurotypical youth demonstrated that high levels of psychological control exhibited by parents during preadolescence were associated with higher levels of depression and anxiety in adolescence (Pettit et al. 2001). The reasoning used in these findings is that a child’s budding autonomy may be thwarted by an intrusive parent, thus shaping their insecurities and anxiety. However, our definition of directive behavior is different to the concept of “psychological control”, which contains characteristics of hostility (see Barber and Harmon (2002)). Our construct of directive behavior, which was a composite of the dominance and lecture/moralizing codes from the IFIRS, may not be associated with as many negative outcomes as a conceptual definition that includes hostility. Alternatively, parents may be providing more guidance when their children are anxious, in an effort to help alleviate these symptoms, which may be an effective approach. Many early interventions and parent-mediated therapy programs employ guided support and scaffolding to teach social, communication, and adaptive skills (e.g., Pickles et al. 2016), so autistic children appear to benefit from more directive parenting than neurotypical children. Given that anxiety is a concern for an estimated 42% of autistic adolescents with ASD (Simonoff et al. 2008), it will be important to continue to investigate the relation between parent directive behavior and anxiety to better understand how these characteristics are related over time.

Strengths and Limitations

Several limitations must be considered in the current results. First, the small sample size limit the generalizability of this study and our ability to make conclusions about results involving correlations. The participants had average levels of intellectual functioning and the majority were boys, so the current pattern of findings may not apply to families of autistic children with intellectual disability or to families of autistic girls. The cross-sectional design of the current study also limits our ability to draw conclusions about directionality. In addition, although we were able to gather rich family demographic information, we were unable to examine commonly known moderators of family processes in neurotypical development, including family income, race and ethnicity, and the gender of parents and children. Parenting and parent–child interactions likely have influence on the trajectory of autism symptoms and conditions that co-occur with autism. Researchers have called for

the examination of processes that moderate the relations between etiological risk factors and the severity of autism symptoms (Mundy et al. 2007), and parent–child interactions have been identified as a promising influence on the development of variability observed within the population (see McCauley et al. (2019)). Future research should investigate how varying family contexts moderate interaction characteristics and autism symptoms across time in families of autistic children.

In addition, the study does not address the possibility of genetic influences between children and parents, as we had no measure of genetic makeup or any measures of relevant symptoms in parents. For example, as autism and anxiety both have genetic etiological contributions, how parent levels of anxiety or phenotypical autism symptoms relate to the quality of parent–child interactions with their children is unknown. Levels of phenotypic autism symptoms in parents are related to their experience of parenting stress (Ingersoll and Hambrick 2011), but it is possible that these symptoms may create differences on observable interaction characteristics. Additionally, our study was limited by reliance on questionnaire data to examine the associations between child functioning and features of the parent–child interaction.

Our study has several strengths. First, we had a well-characterized sample of autistic children and used robust measures to verify diagnosis. Second, the sample was also matched on age, gender composition, and assessments of cognitive ability to a sample of neurotypical children, allowing us to better specify differences in family interaction characteristics. Third, we used an observational coding scheme that helped discover unique features of interactions that may not be adequately captured on parent-reported questionnaires. We have demonstrated that observational coding methodology is feasible and informative to the study of parent–child relationships in families of autistic children, so future research should strive to incorporate larger samples and more diverse measurements of child characteristics.

5. Conclusions

5.1. Implications for Parenting in the 21st Century

In the 21st century, parenting autistic children requires a balance between providing optimal support and direction. While neurotypical children tend to benefit from support and additional autonomy as they mature, autistic children may benefit from more directive parenting, as compared to neurotypical children, in addition to their parent’s support at least into late childhood. This is an important nuance, considering that parents are commonly employed to modify and scaffold their autistic children’s behavior through parent intervention programs. Critically, parents in the current study displayed high levels of warmth, engagement, and enjoyment during interactions with their children and these parent interaction characteristics were not associated with autism symptoms. While reports have documented high levels of parenting stress associated with autism, there remains little concern that autism itself instills negative patterns of parent–child interactions.

5.2. Implications for Future Research and Practice

The results of this study have implications for future research and practice. First, we need to better understand how the parent–child relationship in families of autistic children develops, and how families navigate interactions in the presence of social and communication challenges. Second, providers for families of autistic children should understand and emphasize that the developmental needs of autistic children are likely different than the needs of neurotypical youth in terms of parent support and autonomy-granting, and should converse with families about their child’s individual needs accordingly.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/socsci11030100/s1>, Table S1: Parent Demographic Information, Table S2: Factor Loadings on Iowa Family Interaction Scales.

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