Student-Teacher Relationships and Early School Adaptation of Children with ASD: A Conceptual Framework

Abbey S. Eisenhower, Hillary Hurst Bush & Jan Blacher

SCIENCE TO PRACTICE

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ABBEY S. EISENHOWER and HILLARY HURST BUSH

Department of Psychology, University of Massachusetts Boston, Boston, Massachusetts, USA

JAN BLACHER

Graduate School of Education, University of California, Riverside, Riverside, California, USA

In this conceptual article, we integrate existing literature on early school transitions, ecological systems theory, and student-teacher relationships to propose a framework for investigating the transition to school for children with autism spectrum disorders (ASD). A review of the literature suggests that the quality of early student-teacher relationships may play an important role in this process for young children with ASD. Factors important in predicting student-teacher relationship quality, and ultimately, early school outcomes, are derived from the existing literature, which is heavily focused on the experiences of typically developing children. Hypothesized direct effects of child characteristics, teacher factors, classroom/school characteristics, and parent-school connectedness on student-teacher relationship quality are set forth. Potential moderators of the relation between student-teacher relationship quality and child outcomes are proposed, including child cognitive functioning, child relationships with other school staff, classroom placement, and parent involvement. Continued research on these factors will help identify malleable targets for school-based intervention with teachers and children with ASD to enhance student-teacher relationship quality and, in turn, school adjustment for this student population.

Address correspondence to Abbey S. Eisenhower, PhD, Assistant Professor, Department of Psychology, University of Massachusetts Boston, 100 Morrissey Boulevard, Boston, MA 02125, USA. E-mail: abbey.eisenhower@umb.edu

The transition to school is a crucial milestone for all children, regardless of their disability status (Daley, Munk, & Carlson, 2011). Children entering school are confronted with the task of adapting their social and academic behavior patterns to fit the demands of the school environment (Pianta, 2010; Wildenger & McIntyre, 2012). In turn, the ability to adapt to the school context has important implications for children's long-term academic success, behavioral functioning, and social adjustment (e.g., Hughes, 2011; Schmitt, Pentimonti, & Justice, 2012).

For children with autism spectrum disorders (ASD), cognitive, social, adaptive, self-regulatory, and communicative deficits may make this adaptation process especially challenging. In this paper, we review the existing, limited research on student-teacher relationships (STRs) among young students with ASD; we also consider how research on the role of STRs, which is largely focused on typically developing (TD) students, informs our understanding of early school adjustment for children with ASD. We apply Bronfenbrenner's ecological systems theory, to outline the child-, parent-, teacher-, and school-related factors that may influence STRs, in addition to the ways in which STR quality may interact with these factors to predict school adjustment for children with ASD. We emphasize literacy development as a key outcome of successful STRs, given the foundational nature of literacy skills in children's early academic success. We further argue that additional correlational and longitudinal work is needed ultimately to identify potential interventions for improving STRs and enhancing children's academic and school adjustment.

ASD AND THE POWER OF EARLY EXPERIENCES

Recent prevalence rates categorize ASD as a common disorder (Gillberg, Cederlund, Lamberg, & Zeijlon, 2006; Kogan et al., 2009), with a current estimate of 1 in 68 children in the United States having ASD (Centers for Disease Control and Prevention, 2014). The rise of ASD is accompanied by a surge in service needs, an acute crisis for public schools across the U.S., as reflected in the 488% increase from 1998 to 2007 in the percentage of U.S. students aged 6–21 years classified as having ASD under the Individuals with Disabilities Education Act (U.S. Department of Education, 2012). The question is no longer *whether* public school teachers will encounter a child with ASD, but what they will do *when* this inevitably occurs (Blacher, Linn, & Zeedyk, 2015).

Appreciable differences in the overall cognitive and social development of children with ASD can be made through home-based early intervention

with parents (e.g., Howlin, Magiati, & Charman, 2009; Rogers & Vismara, 2008; Wong & Kwan, 2010), school-based programs with teachers (e.g., Lawton & Kasari, 2012; Strain & Bovey, 2011), and community-based group interventions (e.g., Eikseth, Klintwall, Jahr, & Karlsson, 2012). Yet, there is little research on the transition to early schooling for children with ASD, despite agreement that this may be a critical period to intervene in setting the stage for long-term school adjustment. In this paper, we focus on early relationships with teachers as a point of intervention, given that STRs are highly predictive of children's future school experiences (Hughes, 2011; Schmitt et al., 2012). Although the majority of existing literature on STRs and early school adaptation is focused on children without ASD; this research informs our understanding of the factors that may impact STR quality for children with ASD and how STR quality may contribute to their early school adjustment.

THE TRANSITION TO SCHOOL AND ASD

The entry into school reflects a qualitative shift in the context of children's development and brings a host of new challenges for young children with ASD, who may be at particular risk for poor school outcomes. These might include: academic underachievement (Basil & Reyes, 2003; Whitby & Mancil, 2009), disruptive behavior (Kaat, Gadow, & Lecavalier, 2013; Simonoff et al., 2008), emotion dysregulation (Mazefsky, Pelphrey, & Dahl, 2012), and peer rejection (Chamberlain, Kasari, & Rotheram-Fuller, 2007). ASD is associated with deficits in academic, communication, and relational domains from early childhood into adolescence and even adulthood (Cederlund, Hagbern, Billstedt, Gillberg, & Gillberg, 2008; Murray & Pianta, 2007). Fortunately, there are well-documented parenting programs and educational experiences that impact the social and behavioral symptoms of ASD (Pillay, Alderson-Day, Wright, Williams, & Urwin, 2011; Rocha, Schreibman, & Stahmer, 2007; Rogers et al., 2012), and many children do receive such early intervention prior to formal school entry. However, these programs rarely, if ever, involve public school teachers or school psychologists in the early school grades.

THEORETICAL FRAMEWORK FOR EARLY SCHOOL ADAPTATION FOR CHILDREN WITH ASD

Bronfenbrenner's (1979) ecological systems theory provides a helpful framework for understanding children's early adaptations to school, emphasizing as it does the importance of multiple levels of the child's environment in exerting both direct and indirect influences on child development. As demonstrated by the work of researchers such as Farmer and Farmer (1999),

Rimm-Kaufman and Pianta (2000), Seginer (2006), and others, ecological systems theory is relevant for understanding children as students, especially those at risk for adjustment difficulties such as children with ASD (Odom et al., 2004), by organizing the multiple school factors that may influence the transition to early schooling (Pianta, 2010). This theoretical perspective suggests examining not only direct contextual influences, such as parents, school, and peers (Bronfenbrenner's microsystem), but also the effects of associations between these contexts, such as parent-teacher relationships and parents' involvement in the school (the mesosystem), indirect factors such as the school administration or special education service systems affecting child experiences (the exosystem), and broader, societal factors such as laws and policies guiding classroom placement or service provision (the macrosystem). Finally, developmental changes over time for both the child and these systems (the chronosystem) warrant consideration; the temporal context, in which rates of ASD, ASD awareness, and treatment options are on the upswing, may indirectly impact children's adjustment by influencing parent and teacher perceptions, supports, and services received. In all, child, parent, teacher, classroom, and school factors are likely to influence school adjustment for young children with ASD.

A strong theoretical rationale for the importance of student-teacher relationships in children's school adjustment comes from attachment theory (Bowlby, 1969), which posits that young children who have close, positive relationships with the adults in their lives are better equipped to attend to their environment, communicate with adults (including teachers), and devote their energy toward learning (e.g., Sabol & Pianta, 2012). On the other hand, children who have conflictual, overly dependent, or detached relationships with important adults may be less emotionally secure, less willing to explore their environment, and less prepared to forge relationships with their teachers and to learn from them (Sette, Spinrad, & Baumgartner, 2013). While Kanner's (1943) original description of autism described a failure to develop emotional bonds or "affective ties" with parents, later research demonstrated the ability of children with ASD to exhibit attachment (Capps, Sigman, & Mundy, 1994) and to respond positively to their mothers' displays of sensitivity and responsivity (Blacher, Baker, & Kaladjian, 2012), although the specific attachment behaviors shown in ASD may differ in light of the deficits in social communication and social responsivity characteristic of ASD.

Research on the relationships between children with ASD and their parents can inform our understanding of these children's relationships with teachers. Parents of children with ASD report difficulty interpreting and responding to the unusual and limited communication of their young children with ASD; this may pose a particular risk to developing strong attachment, which is rooted in communication (Kobak, 1999; Wilkins, 2010). In turn, parents report feeling frustrated and inept when their attempts to communicate with their children with ASD are unsuccessful (Wilkins, 2010); globally,

they experience higher stress and depressive symptoms than parents of TD children or children with other disabilities (e.g., Carter, Martinez-Pedraza, & Gray, 2009; Weitlauf, Vehorn, Taylor, & Warren, 2012). Teachers, too, may be at risk of feeling frustrated or ineffective in their interactions with children with ASD. On the other hand, when parent synchronicity and sensitivity are strong and when frequent verbal prompts are employed by parents, young children with ASD show increased compliance and joint attention (Lemanek, Stone, & Fishel, 1993; Siller & Sigman, 2002). Thus, while children with ASD may initially elicit and/or experience a potential pattern of heightened stress, coercive interactions, and relational negativity with adults (Blacher, et al., 2012; Croft et al., 2001), synchronicity and sensitivity by adults may promote better child attention and compliance, two domains that are integral to positive STRs and academic engagement. In the school context, the quality of STRs similarly may depend on the teachers' ability to show synchronicity and sensitivity, especially in the presence of challenging child behavior.

While children's ASD symptoms and behavior problems may relate to poorer parent well-being, which in turn poses a threat to parent-child relationship quality (Van Hooste & Maes, 2003), these pathways are not deterministic. For example, in their study of 25 parent-child dyads, Beurkens, Hobson, and Hobson (2013) found that children's ASD symptoms were negatively correlated with observed parent-child interactive quality but not with parent-reported parent-child relationship quality, including parents' satisfaction, involvement, and communication within this relationship. In another study, Seskin and colleagues (2010) found that higher parent-rated parent-child attachment quality was associated with an increased ability to engage their children in reciprocal social interaction, imaginative thinking, and symbolic play. These interactive behaviors are particularly important because they have been enhanced successfully through intervention (e.g., Mahoney & Perales, 2003; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). These findings suggest variation in relationship quality that is not dictated by ASD symptom severity. Further, they speak to the importance of helping students with ASD build strong, attached relationships with teachers; as with parent-child attachment quality, when student-teacher attachments are strong, teachers may be better positioned to promote reciprocal interaction and to engage positively with these students.

EARLY STUDENT-TEACHER RELATIONSHIPS AND CHILDREN WITH ASD

Among TD children, STR quality in preschool, kindergarten, and first grade predicts adjustment in multiple domains, including behavioral adjustment (Silver, Measelle, Armstrong, & Essex, 2010), social acceptance (Arbeau,

Coplan, & Weeks, 2010), social competence (Griggs, Gagnon, Huelsman, Kidder-Ashley, & Ballard, 2009; Pianta & Stuhlman, 2004), school attitudes (Birch & Ladd, 1997), work habits (Hamre & Pianta, 2001), and academic performance including language arts, reading, and math (Hamre & Pianta, 2001; Peisner-Feinberg et al., 2001), both concurrently and in later grades. These longitudinal studies suggest that the pathway between STR quality and later adjustment may be a causal one, although this has not been experimentally tested. It is likely that students with ASD share many of the same benefits of positive early STRs. However, where students with and without ASD may differ significantly is in their ability to form close, positive STRs during the early school years.

Seeing that one of our main goals for the current paper was to provide a concise review of the research to date on STRs among young children with ASD, we performed a comprehensive literature search to identify empirical, peer-reviewed, English-language articles and dissertation studies on this topic. We conducted a search of the following databases: Academic Search Complete, CINAHL Complete, Educator's Reference Complete, ERIC, Google Scholar, MEDLINE, PsycINFO, and Teacher Reference Center. In doing so, we searched for key words "autism" or "Asperger," paired with either "student teacher relationship" or "teacher student relationship." No restriction was placed on publication date. This phase of the literature search yielded seven articles. Next, a second search was conducted by consulting the primary sources cited within the seven articles obtained through the database search; however, this did not yield any additional, unique articles. Sources were included based on relevance to STRs for students with ASD; specifically, we retained articles that included child participants with ASD, and in which STRs were a key independent variable, dependent variable, mediator, or moderator. We did not include articles that focused on a related topic, such as student-teacher communication, student-teacher interaction, or teachers' attitudes, without addressing STRs specifically.

As shown in Table 1, our review revealed only seven empirical, peer-reviewed studies (Blacher, Howell, Lauderdale-Littin, Gennaro, & Laugeson, 2014; Breeman et al., 2014; Brown & McIntosh, 2012; Eisenhower, Blacher, & Bush, 2014; Longobardi, Prino, Pasta, Gastaldi, & Quaglia, 2012; Prino, Pasta, Gastaldi, & Longobardi, 2014; Robertson, Chamberlain, & Kasari, 2003) and two dissertations (Howell, 2010; Locke, 2010) examining the STR quality of children with ASD. Of note, each of these seven studies was correlational and exploratory in nature; none tested the impact of an intervention to improve STRs between teachers and students with ASD. The findings of these existing studies suggest that children with ASD are at heightened risk for detached, conflictual STRs. Multiple studies of school-age children with and without ASD included a TD comparison group (Blacher et al., 2014; Locke, 2010;

TABLE 1 Summary of Studies Examining the Student-Teacher Relationships of Children with ASD

Study	ASD group	Comparison group	Measure(s) of STR quality	Other constructs measured (measure used)	Findings
Robertson, Chamberlain, & Kasari, 2003	2nd and 3rd grade students with verbal or full-scale IQs of at least 70 (M = 9 years), N = 12 (2 female) who were placed full-time in general education classes. ASD diagnoses were based on school designation and independent psychologist evaluations.	2nd and 3rd grade students (M = 9 years), n = 175; used for peer inclusion ratings, not compared on STR quality	*STRS* by teacher and SEAs	Child behavior problems (teacher-report on the *SNAP-IV Rating Scale*); Peer social inclusion in classroom (free recall paradigm; both ASD and non-ASD children responded); presence of paraprofessional support.	Behavior problems were associated with poorer STRs. Conflict was negatively associated with closeness and positively associated with dependency. STR quality did not differ by presence or absence of paraprofessional support. No significant differences in peer social inclusion between children with and without ASD; conflictual and dependent STRs associated with poorer social inclusion.

Study	Participants	Comparison group	STRS measure	Other measures	Results
Brown & McIntosh, 2012	Boys in K–3rd grade with ASD ($M = 7.5$ yrs) who were placed full-time in general education classes, $N = 15$. ASD grouping was based on school specialist's diagnosis and determination of interference with school performance.	No comparison group	STRS by teacher and SEAs	Child behavior problems (teacher-report on the BASC–2, Behavioral Symptoms Index score); teacher and SEA training in ASD; % of time child receiving general ed. curriculum.	Child behavior problems and percent of time receiving the general education curriculum (i.e., not a modified curriculum) were associated with student-teacher relationship quality, but not with student-SEA relationship quality. Teacher or SEA training in ASD did not predict relationship quality.
Longobardi et al., 2012	Students ($M = 7.5$ years), placed in general education classes ($N = 13$, including 11 boys and 2 girls) designated as high and low functioning (7 of each). Means of determining ASD diagnosis were not stated.	Four typically-developing classmates per student with ASD ($M = 6.7$ years, $N = 56$); the method for selecting these students was not described.	STRS, Italian version, by primary classroom teacher and support teacher	Social functioning (8-item peer nomination measure completed by all classmates); adaptive skills (teacher report on the ABI), and academic achievement (reports by primary teacher and support on a 2-item scale); age and experience of primary teacher and support teacher, child age.	Children with ASD had significantly higher conflict and lower closeness in STRs than children with TD; student-teacher dependency did not differ between groups. Support teachers' relationships with students with ASD showed significantly less conflict than those of primary teachers but did not differ in closeness or dependency. The primary teacher's age and experience related positively to STR quality for TD students but not for students with ASD. Child age, peer-nominated social functioning and teacher-reported adaptive skills were not associated with STR quality for children with ASD.

TABLE 1 Summary of Studies Examining the Student–Teacher Relationships of Children with ASD *(Continued)*

Study	ASD group	Comparison group	Measure(s) of STR quality	Other constructs measured (measure used)	Findings
Blacher et al., 2014	Students (*M* = 8.8 years) attending non-public schools for children with ASD, *N* = 36. ASD diagnosis was based on school report of a psychologist's diagnostic assessment.	Age-matched children with intellectual disability (ID; N = 38) and typical development (TD; N = 91)	*STRS* by teacher	Child behavior problems (parent-reported *CBCL* externalizing T score and teacher-reported *TRF* externalizing T score); social skills (parent- and teacher-reported *SSRS*); ASD symptom severity and autistic mannerisms (parent and teacher report on the *SRS*).	Children with ASD had significantly poorer STR quality (total quality, closeness, and conflict) than children with ID or TD. Teacher-reported externalizing behavior and social skills were associated with total STR quality, and parent-reported social skills, but not behavior problems, were associated with total STR quality. Overall, student–teacher closeness was more strongly related to social skills while student–teacher conflict was more strongly linked to behavior problems. Level of autistic mannerisms was associated with student–teacher closeness.
Breeman et al., 2014	414 students (*M* age = 10.1 years, range = 5–13 years; 87% male), attending special education schools in the Netherlands. Of these, 177 (43%) had ASD; authors did not test children with ASD as a distinct group. Other children included in the sample had ADHD (40%), ODD or CD (28%), anxiety (5%), mood disorder (3%), and other diagnoses (19%).	Authors included descriptive data collected from TD children to highlight differences between children in general/special education; however, the authors did not collect these data, and they were not included in any other analyses.	*STRS* (Dutch version) by teacher; Closeness subscale only	Teacher personal competence and well-being (Dutch version of the MBI); child peer interactions (Dutch version of the DCCS); prosocial behavior and peer dislike (via unlimited peer nominations); child behavioral/emotional problems (PBSI); child sex.	Multipath path models were used to test the relations between teacher characteristics, classroom social relationships, and child emotional and behavioral outcomes. Student–teacher closeness was tested both as a predictor and as an outcome variable. Student–teacher closeness was found to predict emotional and behavioral adjustment, prosocial behavior, and peer dislike, all in the expected directions. Further, emotional and behavioral adjustment were found

Study	Participants	Comparison group	Measure	Construct	Findings
	Diagnostic status was based on having a formal diagnosis from a licensed psychologist or psychiatrist; authors reviewed participants' school records.				to predict student-teacher closeness, as did teacher closeness. Note: All results reflect a mixed sample of children, including those with ASD and those with other diagnoses; subgroup analyses were not included.
Eisenhower et al., 2014	166 students with ASD (*M* age = 5 years, 8 months; 82% male), predominantly attending public schools (72%). ASD diagnosis was based on ADOS administered by researchers.	No comparison group	*STRS* by teacher	Child cognitive functioning (*WPPSI-III*); externalizing behavior problems (parent-reported *CBCL* externalizing T score and teacher-reported *TRF* externalizing T score).	Analyses showed a child-driven pathway through which child externalizing behavior problems predicted a decline in STR quality over time. Specifically, externalizing problems predicted increased student-teacher conflict from the fall to the spring of the school year, and they predicted increased student-teacher conflict and decreased student-teacher closeness in the fall of the following school year.
Prino et al., 2014	14 students with ASD; these participants were combined with students with Down syndrome (*N* = 18) for analysis. *M* age for students with ASD or DS = 7 years, 2 months, *SD* = 1 year, 8 months. Means of determining ASD diagnosis were not stated.	128 TD students (64 males, 64 females) were compared with students with ASD or SD. Authors also included samples of students with and without learning disabilities, and a sample of students with and without ADHD. Means of selecting controls were not stated.	*STRS*, Italian version, by primary classroom teacher and support teacher. Data not collected from support teachers for controls.	Child symptoms of hyperactive behaviors and distraction; measured by the *SDAI*, an 18-item Italian language questionnaire based on DSM-IV diagnostic criteria for ADHD.	Children with ASD were reported by teachers to have significantly greater student-teacher conflict and dependency, and significantly less student-teacher closeness relative to both TD students and students with DS.

TABLE 1 Summary of Studies Examining the Student-Teacher Relationships of Children with ASD *(Continued)*

Study	ASD group	Comparison group	Measure(s) of STR quality	Other constructs measured (measure used)	Findings
Howell, 2010	90 students (*M* age = 6.8 years, *SD* = 2.6 year) with educational diagnoses of "autistic-like behavior" who were attending public (*N* = 33) and non-public (*N* = 57) schools.	No comparison group	*STRS* by teacher	Child behavior problems (parent-reported *CBCL* total T score and teacher-reported *TRF* total T score); social responsiveness (parent and teacher report on the *SRS*); ASD symptom severity (parent and teacher report on the *GARS*); social cognition (child performance on the *TOM*); type of classroom and school setting; family income.	Children with higher behavior problems, lower social cognition, and lower social responsiveness had poorer quality STRs. Children in more restrictive educational classroom settings and those in non-public schools had more student-teacher conflict and less student-teacher closeness than those in less restrictive classrooms and those in public schools. Family income was positively associated with student-teacher closeness. Teachers' years of teaching experience was positively associated with student-teacher dependency but not with closeness or conflict.

| Locke, 2010 | 21 students with ASD (86% male; M age = 6.1 years, SD = 1 year) in general education classrooms (K-2nd grade). ASD status was determined by having a formal diagnosis from a licensed psychologist. | 21 TD children, selected from a larger study sample of 270 children, who were matched to the ASD participants on age, gender, grade, and classroom. | *STRS* by teacher | Child social skills (parent- and teacher-reported SRS and SSQ); social responsiveness (parent- and teacher-reported SRS); child friendships (child-reported SNFS). | Children with ASD, relative to TD children, showed significantly more student-teacher conflict and significantly less student-teacher closeness, although student-teacher dependency was comparable between groups. There was a significant main effect of teacher-reported children's social skills (SSQ) on student-teacher conflict, dependency, and overall STR quality. However, SSQ scores did not predict significantly student-teacher closeness. |

Note. ASD = autism spectrum disorders, TP = typically developing, SEA = special education assistant, *STRS* = Student-Teacher Relationship Scale (Pianta, 2001), *BASC-2* = Behaviour Assessment System for Children, Second Edition (Reynolds & Kamphaus, 2004), *CBCL* = Child Behavior Checklist for ages 1.5–5 and Child Behavior Checklist for ages 6–18 (Achenbach & Rescorla, 2000, 2001), *TRF* = Teacher Report Form (Achenbach & Rescorla, 2000, 2001), *SRS* = Social Responsiveness Scale (Constantino & Gruber, 2005), *MBI* = Maslach Burnout Inventory (Shaufeli & Van Dierendonck, 2000), *DCCS* = Dutch Class Climate Scale (Donkers & Vermulst, 2014), *PBSI* = Problem Behavior at School Interview (Erasmus Medical Center, 2000), *WPPSI-III* = Wechsler Preschool and Primary Scale of Intelligence, 3ʳᵈ edition (Wechsler, 2002), *SDAI* = Scala per l'individuazione di comportamenti di disattenzione e iperattività (Cornoldi et al., 1996), *GARS* = Gilliam Autism Rating Scale (Gilliam, 1995, 2006), *TOM* = Theory of Mind (Wellman & Liu, 2004), *SSRS* = Social Skills Rating Scale (Gresham & Elliott, 1990), *SSQ* = Social Skills Q-Sort (Locke, 2010), *SNFS* = Social Networks and Friendship Survey (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988).
All studies in Table 1 were cross-sectional. All studies reflect U.S. samples except for the study by Breeman and colleagues (2014), which was conducted in the Netherlands, and for the studies by Longobardi and colleagues (2012) and Prino and colleagues (2014), which were conducted in Italy.

Longobardi et al., 2012; Prino et al., 2014) and mean child ages ranging from 6.1 to 8 years. In these studies, children with ASD had poorer STR quality with their teachers than their TD peers, marked by higher conflict and lower closeness. Further, Blacher and colleagues (2014) found that STR quality for children with ASD was significantly lower than that of age-matched children with intellectual disability (ID), and Prino and colleagues (2014) found that STR quality was poorer for children with ASD when compared with children with Down syndrome. While Locke (2010) and Longobardi and colleagues (2012) found no differences between children with and without ASD on levels of dependency on teachers, Blacher and colleagues (2014) found higher dependency on teachers relative to TD children, a finding replicated by Prino and colleagues (2014) for their combined sample of children with either ASD or Down syndrome. Other studies of students with ASD have identified child factors associated with STR quality, including levels of problem behavior (Breeman et al., 2014; Brown & McIntosh, 2012; Eisenhower et al., 2014; Howell, 2010; Robertson et al., 2003), emotional adjustment (Breeman et al., 2014), and social cognition and responsiveness (Howell, 2010). Breeman and colleagues (2014) also identified a teacher factor—teacher competence—as a predictor of STR quality.

Given the cognitive challenges (e.g., rigid or "black and white" thinking, ID) and communication challenges (e.g., difficulty interpreting verbal and non-verbal cues, impaired ability to engage in back-and-forth conversation) often observed among children with ASD, teachers may play a more active, hands-on role in helping students with ASD meet the everyday demands of school. For example, teachers may facilitate peer relationships (e.g., encouraging a child with ASD to join a game or activity during recess), particularly in integrated classrooms. Ironically, the very social-communicative symptoms that may increase students' reliance on teachers are the same symptoms likely to impede the development of close, positive STRs. Due to the potentially amplified role of the teacher for students with ASD, research to identify means of enhancing teachers' ability to relate effectively to their students with ASD is especially important.

Research on STR quality among children with ID but without ASD informs our understanding of the experiences of children with ASD. Estimated rates of students with ASD who also have ID ranges from 31% (CDC, 2014) to 55% (Charman et al., 2011), introducing additional challenges for this subset of children that may affect relationship development. Kindergarteners and first graders with ID have lower student-teacher closeness and higher conflict and dependency with teachers relative to their TD peers (Eisenhower, Baker, & Blacher, 2007; McIntyre, Blacher, & Baker, 2006). This poorer STR quality for children with ID persisted across the early school years and with different teachers (Blacher, Baker, & Eisenhower, 2009).

CHILD CHARACTERISTICS PREDICTING STUDENT-TEACHER RELATIONSHIP QUALITY

Research among children without ASD indicates that a range of child characteristics predict the nature and quality of early relationships with teachers, including child gender and ethnicity (Mashburn, Hamre, Downer, & Pianta, 2006; Saft & Pianta, 2001), language and cognitive abilities (Justice, McGinty, Zucker, Cabell, & Piasta, 2013; Mashburn et al., 2008), temperament, including shyness, inhibition, and effortful control (Arbeau et al., 2010; Rudasill, 2011), and behavioral adjustment at school entry (Doumen et al., 2008; Hamre & Pianta, 2001; Silver et al., 2010). Consistent with ecological systems theory, these individual characteristics are likely to interact with the child's context to determine school outcomes. For children with ASD, we posit that STR quality may be influenced by comorbid internalizing and externalizing problems, social skills, emotion regulation, ASD symptom severity, and language functioning.

Externalizing and Internalizing Problems

Children and adolescents with ASD are at heightened risk for internalizing symptoms, including depression (Gadow, Guttmann-Steinmetz, Rieffe, & DeVincent, 2011), anxiety (Guttmann-Steinmetz, Gadow, DeVincent, & Crowell, 2010; Simonoff et al., 2008), specific phobia and obsessive compulsive disorder (Leyfer et al., 2006), as well as externalizing symptoms, including attentional problems and oppositional defiant disorder (Kaat et al., 2013; Simonoff et al., 2008). In fact, by age three, 46% of children with ASD and developmental delays in one sample already had clinically elevated internalizing and externalizing problems, compared with 10% of their TD counterparts (Eisenhower, Baker, & Blacher, 2005). Further, on comprehensive diagnostic interviews, 57% to 72% of children with ASD met criteria for at least one comorbid psychiatric disorder, and most of these children have had more than one comorbid disorder (Leyfer et al., 2006; Simonoff et al., 2008; van Steensel, Bogels, & de Bruin, 2013). The greater risk of behavioral and psychiatric problems facing children with ASD, especially when their ASD diagnosis is coupled with low cognitive functioning (Eisenhower et al., 2005), may interfere with the formation of positive STRs (Mahan & Matson, 2011). This may be particularly true when these symptoms are not fully understood by the teacher, suggesting a moderating role of teachers' knowledge about ASD and behavioral comorbidity.

Among TD children, relationships with teachers are stronger for children who start school with fewer externalizing problems (e.g., Doumen et al., 2008). Early externalizing problems (e.g., aggression, hyperactivity, rule-breaking behavior) have been shown to predict uniquely declines in

STR quality over time, and across multiple school years (e.g., Hamre & Pianta, 2001; Silver et al., 2010). Externalizing problems appear to be a strong, negative correlate of STR quality for children with ASD as well, as demonstrated by Brown and McIntosh (2012). In this study of 15 boys with ASD in inclusive, early elementary classrooms, problem behavior explained 52% of the variance in STR quality. Similarly, Robertson and colleagues (2003) found that children with ASD who had poorer quality STRs showed more behavior problems and were less socially included than other children with ASD. This study involved a sample of 12 high-functioning children with ASD, half of whom received paraprofessional support. These two studies focused on high functioning youth in inclusive classrooms and were cross-sectional rather than longitudinal in design. However, Eisenhower and colleagues (2014) found that externalizing behavior problems predicted poorer subsequent STR quality for children with ASD, much like Brown and McIntosh (2012), and that this relation carried into the following school year. Future research, including longitudinal studies with larger samples and a broader range of ASD severity, would help to determine how the relation between externalizing behavior and STR quality may vary and change over time for children with differing ASD severity and educational supports.

While externalizing problems have been found to more strongly predict negative STRs than internalizing problems (Birch & Ladd, 1998), internalizing problems also pose a risk to children's ability to forge relationships with their teachers. In a small Swedish sample, children with internalizing problems (but not externalizing problems) were found to have less close relationships with their teachers than did their peers without internalizing or externalizing problems (Henricsson & Rydell, 2004). Further, temperamental qualities related to internalizing and externalizing symptoms, including shyness and effortful control, have been shown to predict STR quality, especially levels of student-teacher conflict concurrently and in subsequent grades (Rudasill, 2011). Together, these findings suggest that internalizing problems, which are common among children with ASD (Bauminger, Solomon, & Rogers, 2010; Hallett, Ronald, Rijsdijk, & Happé, 2010), may interfere with the formation and maintenance of close relationships with their teachers.

Social Skills

As with TD children (Zhang, 2011) or those with ID (Blacher et al., 2009), the STRs of children with ASD are inevitably influenced by the social competence and relationship-building skills that children bring to the equation. Indeed, in Howell's (2010) study of 90 school-aged children with ASD, children's social responsiveness, as rated by both teachers and parents, predicted STR quality, as did performance on a social cognition task. Similarly, Locke (2010) found that teacher-reported social skills, as measured using the *Social*

Skills Q Sort, were negatively associated with student-teacher conflict, teacher dependency, and overall STR quality for young students with ASD. Among children with ASD, those with relatively poor social skills tend to under-achieve academically, while those with stronger social skills show academic outcomes at or above IQ-based expectations (Estes, Rivera, Bryan, Cali, & Dawson, 2011).

Other Child Factors Hypothesized to Predict STRs

Although existing research has yet to test this association, we expect that children's level of emotion regulation will be associated with the quality of their relationships with teachers. Recent findings by Breeman and colleagues (2014), who measured emotional adjustment alongside behavioral adjust-ment, suggested a bidirectional relation between emotional adjustment and student-teacher closeness for special education students broadly. Most re-search on emotional development among children with ASD has focused on emotion recognition, labeling, and emotional expression (e.g., Ben Shalom et al., 2006; Rieffe, Terwogt, & Kotronopoulou, 2007), and not on emotion regulation; however, problems with emotion regulation may underlie some of the core symptoms of ASD. For instance, elevated emotional reactions, which interfere with cognitive control, may partially account for the intense and prolonged episodes of perseveration common among individuals with ASD. Such elevated negative affect, combined with a failure to regulate the intensity and timing of one's emotions, may explain the rapid emotional esca-lation and heightened reactions, or "meltdowns," common in ASD (Mazefsky et al., 2012). Such difficulties with self-regulation, when they occur in the classroom, may lead to heightened conflict and fewer positive interactions with teachers for children with ASD (Fabes et al., 1999). In fact, the link between early self-regulation and later social relationships may be stronger for children at developmental risk than for TD children (Baker, Fenning, Crnic, Baker, & Blacher, 2007; Gerstein et al., 2011). For instance, among children with and without ID (but not ASD), emotion regulation abilities at age 3 not only predicted later STR quality by age 6, but also fully accounted for the poorer STR quality of children ID as opposed to those without ID (Eisenhower et al., 2007).

We also expect that language and communication functioning will pre-dict STR quality for young children with ASD, just as children's language skills have been associated with student-teacher communication, closeness and conflict among TD children (e.g., Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Ladd, Birch, & Buhs, 1999; Mashburn et al., 2006; Justice et al., 2013). To our knowledge, no study has examined the association between language or social communication and STR quality among chil-dren with ASD. We expect two aspects of language to be especially relevant:

(a) pragmatic language and (b) ASD-specific, stereotyped or unusual speech. Pragmatic language, which involves the ability to use language appropriately across social situations, is particularly impaired for many children with ASD; pragmatic skills are essential to forming and maintaining relationships with others, including peers and teachers (Coplan & Weeks, 2009). Speech patterns common in ASD—including stereotyped speech, odd or unusual intonation, prosody, volume, and pitch of speech, and echolalia—when present, may interfere with teachers' ability to form connections easily and readily with these students. As an example, in a sample of teachers working with students ages 3 through 7 with ASD, teachers were observed to respond inconsistently to communicative bids from students. Indeed, even though responses to a communication inventory suggested that teachers recognized that many of the pre-linguistic gestures, body movements, and facial expressions of students with ASD were in fact communicative attempts, only 24% of non-verbal communicative bids by these students received acknowledgement or response from teachers (Keen, Sigafoos, & Woodyatt, 2005). Possible explanations for this low response rate include not observing the behavior or intentionally ignoring an undesirable communicative behavior; nonetheless, these findings support the contention that these children may encounter less interactive or more detached relationships with teachers and, in turn, may experience the concurrent and long-term liabilities engendered by such relationship problems.

TEACHER CHARACTERISTICS PREDICTING STUDENT-TEACHER RELATIONSHIP QUALITY

Within an ecological systems framework, we consider the role of teachers themselves, given their place alongside parents and peers within the child's microsystem. Teacher strategies, experience, and training may impact their ability to foster STRs with children with ASD.

Teacher Strategies

The specific strategies teachers employ for making expectations clear to their students, and for providing them with emotional and behavioral support and scaffolding to meet these expectations, may be especially important for children with ASD. Effective teacher strategies for students with ASD are frequently rooted in evidence-based interventions, including Applied Behavior Analysis (ABA), the developmental, individual-difference, relationship-based model (DIR), also known as Floortime, and Pivotal Response Treatment (PRT). While tremendous research effort has been devoted to establishing and demonstrating evidence for these interventions, effective teacher strate-

gies are not necessarily complicated or resource-intensive. As outlined by Deris and Di Carlo (2013), effective strategies for educating students with ASD in inclusive classrooms include, but certainly are not limited to the following: posting classroom rules and schedules on the walls and referring students to these, providing a "quiet area" in the classroom, maintaining a regular schedule and alerting students of any changes to it in advance, and providing students with visual "menus" from which they can choose a coping skill to use, a preferred sensory toy, and the like. In a study of teachers of students with ASD in the Netherlands, Manti, Scholte, and Van Berckelaer-Onnes (2013) found that teacher strategies were captured by four domains: *instruction* (e.g., repetition of instructions and use of an individualized education plan), *emotional support* (e.g., initiating a positive relationship and highlighting students' positive qualities), *communication* (e.g., promotion of social skills and social cognition), and structure (e.g., managing daily routines, rewarding positive behavior). Of these four domains, teachers' provision of structure most strongly predicted positive outcomes for students with ASD, in both the short and long term, while teacher emotional support also predicted positive student outcomes in the long-term. In all, while the specialized educational needs of children with ASD can be addressed in many ways, research is needed to examine the effectiveness of various teaching approaches in promoting positive STRs.

To measure teachers' preparation to meet the needs of students with ASD, Hendricks (2011) conducted a large-scale online survey among 498 special education teachers with diverse training, years of experience, classroom settings, and ASD-specific teaching experience. Teachers reported low to moderate levels of *knowledge* about ASD and effective ASD-specific instructional practices, and similarly low to moderate levels of *implementation* of effective ASD-specific teaching practices. These levels of knowledge and implementation were lower than what would be hoped or expected for special education teachers, who are especially likely to encounter students with ASD over the course of their careers. A limitation of this study is the absence of student outcome data. Future research could examine how teacher reports were linked to outcomes for students with ASD. Nonetheless, the findings suggest a need for improved teacher education and skill-building in ASD, both on a pre-service and in-service level.

Teachers' Experience

In their study of over 700 general education, pre-kindergarten students nationwide, Mashburn and colleagues (2006) found that more experienced teachers reported lower levels of closeness with students, whereas teachers' level of education was not associated with STR quality. Contrasting research, also with a non-ASD sample, suggests that students whose teachers have less

overall teaching experience encounter more problems adjusting to school (Pianta, Cox, Taylor, & Early, 1999). For children with ASD, the impact of teachers' years of experience on STR quality remains unclear. In the only study we found addressing this, teachers with more years of experience rated their students with ASD as higher in dependency than did less experienced teachers, while ratings of student-teacher conflict and closeness did not differ by experience level (Howell, 2010). While distinct from teachers' experience level, a teacher's level of self-reported competence has also been positively associated with student-teacher closeness among Dutch children in special education settings, including children with ASD. On the other hand, teacher well-being was not correlated with student-teacher closeness.

Teacher Training

Many elementary teachers, including those who may teach children with ASD for all or part of the school day, report having little to no training in ASD, and lacking knowledge of ASD and effective teaching practices for this vulnerable population (Hendricks, 2011; National Research Council, 2001). A similar lack of ASD-specific training is reported by teaching assistants and paraprofessionals (Koegel & LaZebnik, 2004). In the study by Robertson and colleagues (2003), 83% of the general education teachers reported that they never had taught previously a student with ASD, and 50% never had taught a student identified as having any special education needs. Variability across states in teacher training and licensure requirements further contributes to the issue of under-preparedness (Müller, 2004). In addition to training issues, Scheuermann, Webber, Boutot, and Goodwin (2003) also identified the shortage and attrition of special education teachers, the lack of scope and depth of some training models, clashes in theoretical orientation, and reliance on unproven interventions as among the systemic issues that impact the delivery of educational services to children with ASD.

When adequate training is provided, it may lessen the impact of children's ASD symptoms and concomitant behavioral and social problems on their relationships with teachers. However, in the only study we found testing this question, Brown and McIntosh (2012) found that, among young children with ASD in general education classrooms, the general education teachers' level of ASD-specific training did not predict STR quality. Teachers' ASD-specific training also may enhance children's academic outcomes more broadly, above and beyond the impact of STR quality, by resulting in more appropriate and informed teaching in subject areas, such as reading. For example, teacher training in ABA has been shown to predict improvements in students' targeted academic skills (Grey, Honan, McClean, & Daly, 2005). Similarly, overall behavioral improvements have been observed when teachers were provided with intensive training in behavioral techniques (Lerman,

Vorndran, Addison, & Kuhn, 2004). In all, targeted, ASD-specific training and experience may help teachers effectively shape their students' behavior and learning experiences, and enhance STR quality.

CLASSROOM AND SCHOOL CHARACTERISTICS PREDICTING STUDENT-TEACHER RELATIONSHIP QUALITY

School administrative policies about classroom placement and parent-school decision-making around special education services occupy the child's mesosystem and exosystem within an ecological framework. Among children with ASD who are placed in general education classrooms, the percent of time children receive the general education curriculum, versus a modified curriculum, may predict STR quality: Brown and McIntosh (2012) found that children who received the general education curriculum for a greater proportion of the school day had higher STR quality. Similarly, children with ASD in more restrictive placements (e.g., mild-moderate special day classes, moderate/severe classrooms, and non-public schools) have poorer quality relationships with teachers, marked by more conflict and less closeness, than students in less restrictive educational settings (Howell, 2010). This may be due, in part, to the fact that more behaviorally challenged children are more likely to be in more self-contained settings (Howell, Lauderdale-Littin, & Blacher, 2013). In contrast, in a study of children with ID (6% of whom also had ASD), those in general education classrooms actually had *poorer* quality STRs than children with ID who were in special education classrooms, in spite of the fact that IQ was higher, on average, among those in general education classes (Blacher et al., 2009). The latter finding suggests that the kind of synchronous, sensitive, positive student-teacher interactions that may be crucial for positive STRs may be especially difficult in the context of general education classrooms, where teachers have less training in special education or ASD, and where larger class sizes may limit individual attention. Given the mixed results to date, the impact of classroom placement and curricular modifications on STR quality remains to be clarified.

STUDENT-TEACHER RELATIONSHIP QUALITY AS A PREDICTOR OF SCHOOL ADJUSTMENT

Existing studies of children with ASD have focused on STR quality as an outcome, instead of examining STR quality as a predictor of subsequent school outcomes. However, related research with TD children provides a strong rationale for examining the impact of early STR quality on subsequent school outcomes for children with ASD.

Predictor of Literacy Outcomes

Among TD children, less conflictual relationships with teachers in the early months of kindergarten predicted higher classroom participation and better academic achievement by the end of the kindergarten year (Ladd et al., 1999). In fact, children's relationships with teachers in kindergarten were demonstrated to predict uniquely grades in math and language arts, disciplinary infractions, and work habits in upper elementary school and, on some outcomes, into 8th grade (Hamre & Pianta, 2001). Literacy skills in particular appear to thrive in the context of positive student-teacher interactions: TD children who experience higher emotional support from teachers in kindergarten show greater gains in reading skills, namely phonological awareness, by first grade relative to children who receive less teacher support (Curby, Rimm-Kaufman, & Ponitz, 2009). Indeed, the development of literacy skills often depends on intensive, direct instruction from teachers, and thus may be particularly dependent on the quality of one's relationships with teachers. Overall, as the relational context within which academic learning occurs, early STR quality predicts greater achievement in reading (Hamre & Pianta, 2001) and language over time (Burchinal et al., 2002; Peisner-Feinberg et al., 2001).

Research examining the association between STR quality and reading skills for children with ASD is warranted, especially given their often uneven development of literacy skills and the potential need for extra instructional support (e.g., Grigorenko et al., 2002; Whalon & Hart, 2011). The limited research on literacy among children with ASD suggests that they may experience lagging or uneven literacy development, with low reading comprehension emerging as particularly problematic in later elementary grades, as in-class learning depends more heavily on reading (Davidson & Ellis Weismer, 2014). Relationships with teachers may be a means of curbing later comprehension-based learning problems.

Predictor of Externalizing Problems

Among TD youth, highly conflictual or dependent STRs in kindergarten predict a downward trend in adjustment, including more externalizing problems in subsequent grades than would be anticipated based on early kindergarten adjustment (e.g., Pianta, Steinberg, & Rollins, 1995). Doumen and colleagues (2008), using a cross-lagged model, demonstrated a transactional association between externalizing behavior and STR quality across kindergarten, whereby Time 1 aggressive behavior led to increased Time 2 teacher-child conflict, which in turn led to increased Time 3 aggressive behavior. By extension, relationships between children with ASD and their teachers may be susceptible to deterioration over time when externalizing behaviors emerge or persist during the early school years. Further, strained relationships with

teachers during early schooling may exacerbate existing externalizing problems for children with ASD. In a study of children with ASD over 1.5 years and across multiple classrooms and teachers, supported only the former pathway, with elevated externalizing problems leading to worsening STR quality over time, whereas early STR quality did not predict change in externalizing problems (Eisenhower et al., 2014).

Predictor of Internalizing Problems

Among TD children, little research has examined the impact of STR quality on internalizing symptoms. However, cross-sectional research shows a positive association between student-teacher conflict and dependency, and children's internalizing symptoms (Henriccson & Rydell, 2004). We posit that, for children with ASD, detached or conflictual STRs may exacerbate further internalizing difficulties. An absence of warmth, social support, and scaffolding from the teacher may have detrimental effects on children's social experiences, subsequent internalizing symptoms, and overall adjustment; on the other hand, close and supportive relationships with teachers may buffer children with ASD against internalizing symptoms, reducing anxiety and withdrawal and providing a context for overcoming internalizing symptoms in the school setting. Lastly, as with externalizing problems, the association between STRs and internalizing problems is likely to be a reciprocal one.

Predictor of Social Adjustment

In addition to academic and behavioral outcomes, early STRs also have been shown to predict social adjustment (e.g., Mashburn et al., 2008; Peisner-Feinberg et al., 2001), an association that we expect to hold for children with ASD. Among TD children, those who showed secure attachments with their preschool teachers subsequently received higher sociometric ratings of acceptance from classmates, were more empathetic with peers, less withdrawn and aggressive, and engaged in more complex peer play, compared with children who experience insecure student-teacher attachments (Howes, Matheson, & Hamilton, 1994). In fact, Howes and colleagues (1994) found that relationships with teachers were a stronger predictor of children's subsequent behavior with peers than were relationships with parents. Many symptoms and features of ASD, including difficulty interpreting verbal and non-verbal social cues, and difficulty engaging in reciprocal conversations, might impact the peer relations of children with ASD. In a large sample of Dutch children enrolled in special education (42% with ASD), student-teacher closeness was positively associated with prosocial behavior and negatively associated with peer dislike (Breeman et al., 2014). Promoting positive STRs

should be considered as a potential means of enhancing the early social adjustment of children with ASD.

STUDENT-TEACHER RELATIONSHIP QUALITY AS A PROTECTIVE FACTOR FOR CHILDREN AT RISK FOR ADVERSE OUTCOMES

Positive STRs appear to play a particularly strong role for children at high risk for adverse outcomes, by deflecting the course of their adjustment in school (e.g., Baker, 2006; Decker, Dona, & Christenson, 2007; Pianta et al., 1995; Tsai & Cheney, 2012). Indeed, there are stronger associations between STR quality and concurrent and/or subsequent school adjustment for high-risk than for low-risk children, with positive STRs acting as a compensatory resource or buffer against these risks. For instance, when children with high levels of behavior problems began kindergarten, STRs marked by low conflict and high closeness predicted better work habits, fewer disciplinary infractions, and lower rates of school suspension in later elementary school; this protective effect of the early STR was not seen for children who began school with low levels of behavior problems (Hamre & Pianta, 2001). Similarly, student-teacher closeness was linked most strongly to decreases in externalizing problems for children who began kindergarten with high externalizing behavior (Silver, Measelle, Armstrong, & Essex, 2005), while student-teacher conflict was linked most strongly to subsequent academic difficulties for children with elevated internalizing symptoms at baseline (Baker, Grant & Morlock, 2008). Likewise, strong STRs predicted enhanced academic achievement for TD children with insecure maternal attachments but not those with secure attachments (O'Connor & McCartney, 2007). Finally, in a study directly relevant to children with developmental risk, among kindergarteners with low academic readiness scores at school entry, those who had closer, less conflictual relationships with teachers were ultimately less likely to be retained or placed in special education programs by the end of the school year; this association held even after controlling for baseline levels of classroom noncompliance and behavior with peers (Pianta et al., 1995). In all, a positive STR may be especially pivotal as a buffer for children with behavioral, developmental, or social risk factors.

MODERATORS IN THE LINK BETWEEN STUDENT-TEACHER RELATIONSHIPS AND SCHOOL OUTCOMES

Other factors may moderate the association between STR quality and children's social and academic adaptation to school; these factors are discussed below.

Child Cognitive Functioning

Recent Center for Disease Control and Prevention findings (2014) indicate that roughly 46% of children with ASD have average or above average intellectual ability. There is growing evidence that these children, previously labeled with "high functioning autism" (HFA), can learn effectively in the general education classroom with preparation from early intervention and other supports (Koegel, Matos-Freden, Lang, & Koegel, 2012; see Odom et al., 2004 for a review; Sansosti & Sansosti, 2012). Children with HFA show fewer literacy and language difficulties than children with both ASD and ID but they, too, demonstrate interpersonal deficits that interfere with peer relationships. These children are also likely to have difficulty forming close, non-conflictual relationships with their teachers (Brown & McIntosh, 2012). We posit that the association between children's STR quality and academic development may be moderated by children's cognitive level. STR quality may predict academic development more accurately for children with ID than for those without ID, due to their greater need for teacher support in learning. On the other hand, children with HFA may benefit from strong STRs in ways more similar to TD youth, with positive STRs predicting improved behavioral and academic trajectories over time.

Children's Relationships with Other School Staff

Children with ASD are typically supported by a larger school team beyond the primary classroom teacher, including resource specialists, school psychologists, and in-class teaching assistants (also known as aides, therapists or paraprofessionals but referred to here as "aides"). These aides are usually assigned to the child with ASD on a one-to-one basis, though the ratio can vary. Brown and McIntosh (2012) found that the quality of children's relationships with aides was similar in levels of closeness, conflict, and dependency to that of their relationships with the primary classroom teachers. The aide's relationship with the child may impact the child's relationships with the primary classroom teacher, in addition to having a direct impact on the child's school adjustment (Kamps, Walker, Locke, & Delquadri, 1990; Symes & Humphrey, 2011). Further, the presence of, and quality of the relationship with, an aide may lessen or shape the effects of the primary STR on the child's school outcomes.

The child's relationship with an aide, if present, may be especially important due to the aide's proximity and interaction with the student (Carter, O'Rourke, Sisco, & Pelsue, 2009). Aides spend, on average, 86% of their time within three feet of their assigned students with disabilities (Giangreco & Broer, 2005). Findings regarding the potential impact of aides on the students' relationships with their primary classroom teachers and peers are currently mixed. There is some evidence that, in integrated classrooms, the

aide actually may interfere with a child's ability to develop a relationship with the primary teacher, as well as with peers (e.g., Marks, Schrader, & Levine, 1999; Symes & Humphrey 2011). Symes and Humphrey (2011) found that, when aides were present, students with ASD were less likely to be included socially and to work independently. Further, a study with young children with and without developmental disabilities in an inclusive preschool setting showed that both groups of children were significantly less likely to seek interactions with peers after having engaged in an adult-initiated interaction (Harper & McCluskey, 2003). On the other hand, Robertson and colleagues (2003) found no differences in student-teacher closeness, conflict, or dependency between children with ASD who did and did not have aide support. Further, teachers in inclusion classrooms are less likely to feel rejecting or conflicted toward their elementary students with disabilities when an aide was assigned to support the student (Cook, 2004). Students' own perceptions of aide support reflect the ambiguity of these findings, suggesting both an interfering role, in which the aide's presence precludes interaction with teacher or peers, and a beneficial role, in which the aide provides a sense of school belonging (Broer, Doyle, & Giangreco, 2005; Tews & Lupart, 2008). Relatedly, children's relationships with other school service providers (e.g., occupation or speech therapists) have not been shown to interfere with the closeness of the primary STR (Giangreco, Edelman, Luiselli, & MacFarland, 1997). In all, the limited research, though mixed, suggests that the presence of an aide may reduce the student's likelihood of benefiting from a close primary STR. Though the presence of an aide may enhance the child's learning and peer interactions, there is little evidence that it improves or complements the relationship with the primary classroom teacher; further research is needed to test this question empirically.

Classroom Placement

Children's classroom placement may also interact with STR quality in predicting school adjustment. Increasing numbers of children with ASD at all levels of cognitive functioning are being placed in general education classes, especially in the early grades; indeed, placement in the least restrictive environment is not only considered best practice (Harrower & Dunlap, 2001) but is also mandated by federal law under the Individuals with Disabilities Education Improvement Act (IDEA; 2004). However, the evidence is mixed regarding the impact of general education placement on STRs. As described earlier, children with ASD who received fewer curricular modifications or placement in a less restrictive classroom environment experienced better STRs than children receiving more curricular modifications or a more restrictive placement (Brown & McIntosh, 2012; Howell, 2010). There is clearly a need to examine placement while controlling for behavior problems and IQ in young children with ASD. In all, classroom placement (general ver-

sus special education) may have both a direct impact on STR quality and a moderating effect on the association between STR quality and school adjustment, altering not only the degree of opportunity children have to form relationships with teachers, but also the extent to which these relationships influence their academic development.

Parent-School Connectedness

Positive parent-school connectedness, including parental involvement in school and positive, collaborative parent-teacher relationships, may facilitate the development of positive STRs, in addition to fostering behavioral and academic gains more directly (Moes & Frea, 2002). Positive parent-teacher relations may pave the way for improved teacher knowledge of the child and more positive regard between teacher and student. Indeed, in a study of preschoolers with a range of disabilities or typical development, parent-teacher relationship quality was a strong predictor of STR quality for both groups (Chung, Marvin, & Churchill, 2005). The link between parent-teacher relationship quality and subsequent STR quality appears to be greater for children with social, economic, or behavioral risks (i.e., poverty, racial minority status, past behavior problems) than for children without such risks (Serpell & Mashburn, 2012), though effective parent-teacher collaborations may also be harder to achieve in the context of such risks (e.g., Vazquez-Nuttall, Li, & Kaplan, 2006).

In addition to the direct impact on STR quality, parent-school connectedness also may enhance, or moderate, the association between student-teacher interaction quality and children's school adjustment. Likewise, positive parent-teacher relationships may foster behavioral and academic adjustment for children with ASD by overriding or compensating for STR difficulties. This potential buffering effect of parent-teacher communication may be especially pronounced when teachers feel underprepared, under-resourced, or otherwise poorly equipped to help students with disabilities succeed (Chung et al., 2005). As increasing numbers of children with ASD are instructed by general education teachers, many of whom report feeling underprepared or who lack specific training for teaching students with ASD (Hendricks, 2011; National Research Council, 2001), the parental role may become more essential.

CONCLUSIONS AND IMPLICATIONS FOR RESEARCH AND PRACTICE IN SCHOOLS

For both TD children and those with ASD, student-teacher relationships play a crucial role. Improving STRs for children with ASD is an important goal

for future intervention studies, the results of which would benefit school psychologists as well, who are often tasked with facilitating the integration of children with ASD in general education classrooms.

There are limitations to the existing literature, particularly the paucity of studies on STR quality for children with ASD. As noted in our review, these are currently limited to seven peer-reviewed articles, and none of these involved an intervention to improve STR quality. Research to inform the development of STR interventions might include studies that prioritize examining how cognitive functioning, ASD symptom severity, classroom type, and the presence of classroom support staff relate to STR quality. For example, the association between externalizing or internalizing behavior and STR quality may be stronger for children with higher versus lower ASD severity, or for children with fewer educational supports. However, given the degree to which children with ASD are already involved in time-intensive treatments, the feasibility of additional child treatment is limited. Future research that focuses on identifying of parent- or teacher-based factors driving STRs or school adjustment for children with ASD would open the door to family- or school-focused interventions. In the absence of such research, the studies reviewed here have important implications for the work of school psychologists and can inform service delivery for students with ASD.

Improving Teachers' ASD-Specific Training

First, existing research suggests that few teachers have the ASD-specific training they need to relate most effectively to their students with ASD. For example, many elementary teachers, including those who may teach children with ASD for all or part of the school day, report having little to no training in ASD and low knowledge of effective teaching practices for this population (Hendricks, 2011; National Research Council, 2001). Further, in our recent study of teachers who had one or more students ages 4 through 8 with ASD in their classrooms, only 19% reported having received any professional training in ASD, in spite of the fact that 50% were teaching in classrooms where most or all students were receiving special education services. Two-thirds of teachers reported feeling "somewhat prepared" or "very prepared" to teach students with ASD, yet the sources of this sense of preparedness are unclear given the low rate of professional training in ASD (Eisenhower, Blacher, & Rodriguez, 2013). A similar lack of ASD-specific training has been reported by teaching assistants and paraprofessionals (Koegel & LaZebnik, 2004). Thus, further research ought to focus on professional development activities, beginning at the pre-service teaching level, to improve teachers' level of ASD-specific preparedness. Such additional training may take the form of improving teacher education within undergraduate and graduate-

level education programs, creating new continuing education offerings, or providing on-site training within schools and districts.

School psychologists are well-positioned to deliver ASD-specific training, consultation, and support to teachers, both informally and formally, at the school and district levels (National Autism Center, 2009), aligning well with the profession's emphasis on staying abreast of empirically supported practices for educating children with ASD (Williams, Johnson, & Sukhodolsky, 2005). For example, in line with the shift away from an assessment-based paradigm (Wilkinson, 2007; Sheridan & Gutkin, 2000), consultation efforts by school psychologists offer a means by which to train and support teachers of children with ASD. Consultation, an indirect mode of service delivery, is highly valued and preferred by teachers and school psychologists (Gilman & Gabriel, 2004; Kratochwill & Stoiber, 2000), in part because school psychologists are able to work within and across the school system (Segall & Campbell, 2012; Williams, Johnson, & Sukhodolsky, 2005).

Needs of General Education Teachers and Their Students with ASD

In line with the legal mandate that children with disabilities be educated in the least restrictive environment (LRE), full or partial inclusion is common, particularly for high-functioning children with ASD (Goodman & Williams, 2007). Many children garner both academic and social benefits from inclusion programming, which is considered a best practice for special education when possible. However, children in integrated or general education classrooms may be at a heightened risk for poor relationships with teachers compared with children in special education classes (Etscheidt, 2006; Hilton & Liberty, 1992). Indeed, in a study of children with intellectual disability, those in general education classrooms actually had poorer quality STRs than children with ID who were in special education classrooms, in spite of the fact that IQ was higher, on average, among those in general education classes (Blacher, Baker, & Eisenhower, 2009). This finding suggests that the kind of synchronous, sensitive, positive student-teacher interactions that may be crucial for positive STRs may be especially difficult in the context of general education classrooms, where teachers have less training in special education or ASD and where larger class sizes may limit individual attention.

The vulnerability of children with ASD in inclusion classrooms may interact with the lack of preparedness of many general education teachers to address the needs of students with ASD. While the Individuals with Disabilities Education Improvement Act (IDEIA, the reauthorization of IDEA) calls for the use of evidence-based intervention strategies delivered by highly qualified staff in both the general and special education environment, approximately 61% of general education teachers reported that existing teacher preparation programs do not impart the instructional and managerial tech-

niques needed to foster an inclusive environment (Scheuermann, Webber, Boutot & Goodwin, 2003). These findings clearly indicate that the majority of general education teachers, in spite of meeting requirements for state certification, lack significant preparation and coursework needed to instruct children with ASD successfully (Loiacono & Valenti, 2010; Scheuermann et al., 2003). School psychologists have a role in helping their teacher colleagues fill the gaps in ASD-specific training, most notably for general education teachers who may face the greatest need for relationship support with their students with ASD. Indeed, in the spirit of addressing this professional need, Seagall and Campbell (2012) reported that school psychologists maintained higher levels of ASD knowledge, experience, and better attitudes toward ASD than did general education teachers. Further research that incorporates the perspectives of school psychologists may inform the development of protocols that school psychologists can use to provide relationship support to teachers broadly, and in turn, advocate that teachers pay more attention to the emotional as well as academic competence of their young children with ASD (Buckley, Storino & Saarni, 2003).

Implications for the Academic Adjustment of Students with ASD

The ramifications of early STR quality for the academic outcomes of children with ASD, including academic behavior, skill development, and achievement over time, underscore the need for further study and intervention. Literacy skills, in particular, are arguably the foundation of academic development during the early school years. The National Reading Panel (National Institute of Child Health and Human Development, 2000) outlines five key components of reading (the "Big Five"), including phonics, fluency, vocabulary, comprehension, and phonemic awareness; the ultimate goal of reading, of course, is comprehension. Emerging research shows a distinct pattern in the literacy skills of children with ASD in regard to these domains: children with ASD frequently demonstrate alphabet, word knowledge, and phonemic awareness skills that are generally age-appropriate (Lindgren, Folstein, Tomblin, & Tager-Flusberg, 2009; Newman et al., 2007) or above average (Huemer & Mann, 2010; Mayes & Calhoun, 2003), but lower skills in reading comprehension and vocabulary (Grigorenko, Klin, & Volkmar, 2003; Nation, 1999). This profile appears to be consistent across the early elementary grades (Knight, Blacher, & Eisenhower, 2015). This relative weakness in reading comprehension calls for intervention. Notably, close relationships with teachers have been shown to predict better reading comprehension skills for children with ASD; cross-lagged panel analyses suggest that this link may be causal, with early STR quality predicting later improvements in reading comprehension (Blacher, Eisenhower, Tipton, Kaplan-Levy, & Wilson, 2013). Reading comprehension and vocabulary, both areas acknowledged in

national Common Core objectives, may be enhanced for children with ASD through improved relationships with teachers: early intervention to improve STRs may also enhance children's readiness to learn, and teachers' capacity to teach, crucial reading comprehension skills.

Overall, future research and practice that focuses on enhancing training and support to teachers around their relationships with students with ASD is warranted. The current may serves as a call to pay heightened attention to the student-teacher relationship and the ongoing training needs of teachers in serving children with ASD. School psychologists are well positioned to address both.

ACKNOWLEDGMENTS

FUNDING

REFERENCES

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms & profiles*. Burlington, VT: University of Vermont, Department of Psychiatry.

Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA school-age forms & profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.

Arbeau, K. A., Coplan, R. J., & Weeks, M. (2010). Shyness, teacher-child relationships, and socio-emotional adjustment in grade 1. *International Journal of Behavioral Development*, *34*, 259–269.

Baker, J. A. (2006). Contributions of teacher-child relationships to positive school adjustment during elementary school. *Journal of School Psychology*, *44*(3), 211–229.

Baker, J. K., Fenning, R. M., Crnic, K., Baker, B. L., & Blacher, J. (2007). Prediction of social skills in 6-year-old children with and without developmental delays: Contributions of early regulation and maternal scaffolding. *American Journal on Mental Retardation*, *112*, 375–391.

Baker, J. A., Grant, S., & Morlock, L. (2008). The teacher-student relationship as a developmental context for children with internalizing or externalizing behavior problems. *School Psychology Quarterly*, *23*(1), 3–15.

Basil, C., & Reyes, S. (2003). Acquisition of literacy skills by children with severe disability. *Child Language Teaching and Therapy*, *19*, 27–48.

Bauminger, N., Solomon, M., & Rogers, S. R. (2010). Externalizing and internalizing behaviors in ASD. *Autism Research*, *3*(3), 101–112.

Ben Shalom, D., Mostofsky, S. H., Hazlett, R. L., Goldberg, M. C., Landa, R. J., Faran, Y., . . . Hoehn-Saric, R. (2006). Normal physiological emotions but differences in expression of conscious feelings in children with high-functioning autism. *Journal of Autism and Developmental Disorders*, *36*, 395–400.

Beurkens, N. M., Hobson, J. A., & Hobson, R. P. (2013). Autism severity and qualities of parent-child relations. *Journal of Autism and Developmental Disorders*, *43*(1), 168–178.

Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology*, *35*, 61–79.

Birch, S. H., & Ladd, G. W. (1998). Children's interpersonal behaviors and the teacher-child relationship. *Developmental Psychology*, *34*(5), 934–946.

Blacher, J., Baker, B. L., & Eisenhower, A. S. (2009). Stability of student-teacher relationships across the early school years for children with and without intellectual disability. *American Journal on Intellectual and Developmental Disabilities*, *114*, 322–339.

Blacher, J., Baker, B. L., & Kaladjian, A. (2012). Syndrome specificity and mother-child interactions: Examining positive and negative parenting across contexts and time. *Journal of Autism and Developmental Disorders*, *43*(4), 761–774.

Blacher, J., Eisenhower, A., Tipton, L. A., Kaplan-Levy, S., & Wilson, J. (2013, August). *The development of early literacy skills among young children with ASD: Predictors of change over time across literacy skill domains*. Paper presented at the International Meeting for Autism Research, San Sebastian, Spain.

Blacher, J., Howell, E., Lauderdale-Littin, S., DiGennaro, F. D., & Laugeson, E. A. (2014). Autism spectrum disorder and the student teacher relationship: A comparison study with peers with intellectual disability and typical development. *Research in Autism Spectrum Disorders*, *8*, 324–333.

Blacher, J., Linn, R., & Zeedyk, S. (2015). The role of graduate schools of education in training autism professionals to work with diverse families. In D. Mitchell & R. Ream (Eds.), *Professional responsibility: The fundamental issue in education and healthcare reform* (pp. 231–246). New York, NY: Springer.

Bowlby, J. (1969). *Attachment and loss, Vol. 1: Attachment*. New York, NY: Basic Books.

Breeman, L. D., Wubbels, T., van Lier, P. A. C., Verhulst, F. C., van der Ende, J., Maras, A., . . . Tick, N. T. (2014). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education. *Journal of School Psychology*. Retrieved from http://dx.doi.org/10.1016/j.jsp.2014.11.005

Broer, S., Doyle, M., & Giangreco, M. (2005). Perspectives of students with intellectual disabilities about their experiences with paraprofessional support. *Exceptional Children*, *71*(4), 415–430.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (1994). Ecological models of human development. In *International Encyclopedia of Education* (2nd ed., Vol. 3, pp. 1643–1647). Oxford, UK: Elsevier.

Brown, J. A., & McIntosh, K. (2012). Training, inclusion, and behaviour: Effect on student-teacher and student-SEA relationships for students with Autism Spectrum Disorders. *Exceptionality Education International*, *22*, 77–88.

Buckley, M., Storino, M., & Saarni, C. (2003). Promoting emotional competence in children and adolescents: Implications for school psychologists. *School Psychology Quarterly*, *18*, 177–191.

Burchinal, M. R., Peisner-Feinberg, E., Pianta, R., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology*, *40*(5), 415–436.

Cairns, R. B., Cairns, B. D., Neckerman, H. J., Gest, S. D., & Gariepy, J. L. (1988). Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology*, *24*, 815–823.

Capps, L., Sigman, M., & Mundy, P. (1994). Attachment security in children with autism. *Development and Psychopathology*, *6*(2), 249–261.

Carter, A. S., Martinez-Pedraza, F. & Gray, S. A. (2009). Stability and individual change in depressive symptoms among mothers raising young children with ASD: Maternal and child correlates. *Journal of Clinical Psychology*, *65*(12), 1270–1280.

Carter, E., O'Rourke, L., Sisco, L., & Pelsue, D. (2009). Knowledge, responsibilities, and training needs of paraprofessionals in elementary and secondary schools. *RASE: Remedial & Special Education*, *30*(6), 344–359.

Cederlund, M., Hagberg, B., Billstedt, E., Gillberg, I. C., & Gillberg, C. (2008). Asperger syndrome and autism: A comparative longitudinal follow-up study more than 5 years after original diagnosis. *Journal of Autism and Developmental Disorders*, *38*, 72–85.

Centers for Disease Control and Prevention. (2014). Prevalence of Autism Spectrum Disorder –Autism and developmental disabilities monitoring network, 11 sites, United States, 2010. *Surveillance Summaries*, *63*(2), 1–21.

Chamberlain, B., Kasari, C., & Rotheram-Fuller, E. (2007). Involvement or isolation? The social networks of children with autism in regular classrooms. *Journal of Autism and Developmental Disorders*, *37*, 230–242.

Charman, T., Pickles, A., Simonoff, E., Chandler, S., Loucas T., & Baird, G. (2011). IQ in children with autism spectrum disorders: Data from the special needs and autism project (SNAP). *Psychological Medicine*, *41*, 619–627.

Chung, L., Marvin, C. A., & Churchill, S. L. (2005). Teacher factors associated with preschool teacher-child relationships: Teaching efficacy and parent-teacher relationships. *Journal of Early Childhood Teacher Education*, *25*(2), 131–142.

Constantino, J. N., & Gruber, C. P. (2005). *The social responsiveness scale (SRS) manual*. Los Angeles, CA: Western Psychological Services.

Cook, B. G. (2004). Inclusive teachers' attitudes toward their students with disabilities: A replication and extension. *The Elementary School Journal*, *104*, 307–320.

Coplan, R. J., & Weeks, M. (2009). Shy and soft-spoken: Shyness, pragmatic language, and socio-emotional adjustment in early childhood. *Infant and Child Development*, *18*(3), 238–254.

Cornoldi, C., Gardinale, M., Masi, A., & Pettenò, L. (1996). *Impulsività e autocontrollo: Interventi e tecniche metacognitive*. Trento, Italy: Erickson.

Croft, C., O'Connor, T. G., Keaveney, L., Groothues, C., Rutter, M., & the English and Romanian Adoption Study Team. (2001). Longitudinal change in parenting associated with developmental delay and catch-up. *Journal of Child Psychology and Psychiatry*, *42*, 649–659.

Curby, T. W., Rimm-Kaufman, S. E., & Ponitz, C. C. (2009). Teacher-child interactions and children's achievement trajectories across kindergarten and first grade. *Journal of Educational Psychology*, *101*(4), 912–925.

Daley, T. C., Munk, T., & Carlson, E. (2011). A national study of kindergarten transition practices for children with disabilities. *Early Childhood Research Quarterly*, *26*, 409–419.

Davidson, M. M., & Ellis Weismer, M. (2014). Characterization and prediction of early reading abilities in children on the autism spectrum. *Journal of Autism and Developmental Disorders*, *44*(4), 828–845.

Decker, D. M., Dona, D. P., & Christenson, S. L. (2007). Behaviorally at-risk African American students: The importance of student-teacher relationships for student outcomes. *Journal of School Psychology*, *45*, 83–109.

Deris, A. R. and Di Carlo, C. F. (2013). Back to basics: Working with young children with autism in inclusive classrooms. *Support for Learning*, *28*, 52–56.

Donkers, A., & Vermulst, A. A. (2014). Klimaatschaal: Handleiding [Class climate scale: Manual]. Uden, the Netherlands: Orthopraktijk Ad Donkers & Ad Vermulst.

Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., Luyckx, K., & Soenens, B. (2008). Reciprocal relations between teacher-child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, *37*, 588–599.

Eikseth, S., Klintwall, L., Jahr, E., & Karlsson, P. (2012). Outcome for children with autism receiving early and intensive behavioral intervention in mainstream preschool and kindergarten settings. *Research in Autism Spectrum Disorders*, *6*, 829–835.

Eisenhower, A., Baker, B. L., & Blacher, J. (2005). Preschool children with intellectual disability: Syndrome specificity, behavior problems, and maternal well-being. *Journal of Intellectual Disability Research*, *49*, 657–671.

Eisenhower, A. S., Baker, B. L. & Blacher, J. (2007). Early student-teacher relationships of children with and without intellectual disability: Contributions of behavioral, social, and self-regulatory competence. *Journal of School Psychology*, *45*, 363–383.

Eisenhower, A. S., Blacher, J., & Bush, H. H. (2014). Longitudinal associations between externalizing problems and student-teacher relationship quality for young children with ASD. *Research in Autism Spectrum Disorders*, *9*, 163–173.

Eisenhower, A., Blacher, J. & Rodriguez, G. (2013, August). *The early student-teacher relationships of children with ASD in relation to school adjustment*. Presented at the American Psychological Association, Honolulu, HI.

Erasmus Medical Center (2000). *Problem behavior at school interview*. Rotterdam, the Netherlands: Author.

Estes, A., Rivera, V., Bryan, M., Cali, P., & Dawson, G. (2011). Discrepancies between academic achievement and intellectual ability in higher-functioning school-aged children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *41*(8), 1044–1052.

Etscheidt, S. (2006). Behavioral intervention plans: Pedagogical and legal analysis of issues. *Behavioral Disorders*, *31*(2), 223–243.

Fabes, R. A., Eisenberg, N., Jones, S., Smith, M., Guthrie, I., Poulin, R., . . . Friedman, J. (1999). Regulation, emotionality, and preschoolers' socially competent peer interactions. *Child Development*, *70*, 432–442.

Farmer, E. M. Z., & Farmer, T. W. (1999). The role of schools in outcomes for youth: Implications for children's mental health services research. *Journal of Child and Family Studies*, *8*(4), 377–396.

Gadow, K. D., Guttmann-Steinmetz, S., Rieffe, C., & DeVincent, C. J. (2011). Depression symptoms in boys with autism spectrum disorder and comparison samples. *Journal of Autism and Developmental Disorders*, *42*(7), 1353–1363.

Gerstein, E. D., Pedersen y Arbona, A., Crnic, K. A., Ryu, E., Baker, B. L., & Blacher, J. (2011). Developmental risk and young children's regulatory strategies: Predicting behavior problems at age five. *Journal of Abnormal Child Psychology*, *39*(3), 351–364.

Giangreco, M., & Broer, S. (2005). Questionable utilization of paraprofessionals in inclusive schools: Are we addressing symptoms or causes? *Focus on Autism and Other Developmental Disabilities*, *20*(1), 10–26.

Giangreco, M. F., Edelman, S. W., Luiselli, T. E., & MacFarland, S. Z. (1997). Helping or hovering? Effects of instructional assistant proximity on students with disabilities. *Exceptional Children*, *64*, 7–18.

Gillberg, C., Cederlund, M., Lamberg, K., & Zeijlon, L. (2006). Brief report: The autism epidemic. The registered prevalence of autism in a Swedish urban area. *Journal of Autism and Developmental Disorders*, *36*, 429–435.

Gilliam, J. (1995). *GARS: Gilliam Autism Rating Scale*. Austin, TX: Pro-Ed.

Gilliam, J. (2006). *GARS-2: Gilliam Autism Rating Scale – 2nd ed*. Austin, TX: Pro-Ed.

Goodman, G., & Williams, C. M. (2007). Interventions for increasing the academic engagement of students with autism spectrum disorders in inclusive classrooms. *TEACHING Exceptional Children*, *39*(6), 53–61.

Gresham, F. M., & Elliott, S. N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.

Grey, I. M., Honan, R., McClean, B., & Daly, M. (2005). Evaluating the effectiveness of teacher training in applied behaviour analysis. *Journal of Intellectual Disabilities*, *9*(3), 209–227.

Griggs, M. S., Gagnon, S. G., Huelsman, T. J., Kidder-Ashley, P., & Ballard, M. (2009). Student-teacher relationships matter: Moderating influences between temperament and preschool social competence. *Psychology in the Schools*, *46*, 553–567.

Grigorenko, E. L., Klin, A., Pauls, D. L., Sent, R., Hooper, C., & Volkmar, F. (2002). A descriptive study of hyperlexia in a clinically referred sample of children

with developmental delays. *Journal of Autism and Developmental Disorders*, *32*, 3–11.

Grigorenko, E. L., Klin, A., & Volkmar, F. (2003). Annotation: Hyperlexia: disability or superability? *Journal of Child Psychology and Psychiatry*, *44*(8), 1079–1091.

Guttmann-Steinmetz, S., Gadow, K. D., DeVincent, C. J., & Crowell, J. (2010). Anxiety symptoms in boys with autism spectrum disorder, attention-deficit hyperactivity disorder, or chronic multiple tic disorder and community controls. *Journal of Autism and Developmental Disorders*, *40*, 1006–1016.

Hallett, V., Ronald, A., Rijsdijk, F., & Happé, F. (2010). Association of autistic-like symptoms and internalizing traits during early childhood: A longitudinal twin study. *American Journal of Psychiatry*, *167*(7), 809–817.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, *72*, 625–638.

Harper, L. V., & McCluskey, K. S. (2003). Teacher-child and child-child interactions in inclusive preschool settings: Do adults inhibit peer interactions? *Early Childhood Research Quarterly*, *18*, 163–184.

Harrower, J. K., & Dunlap, G. (2001). Including children with autism in general education classrooms: A review of effective strategies. *Behavior Modification*, *25*(5), 762–784.

Hendricks, D. (2011). Special education teachers serving students with autism: A descriptive study of the characteristics and self-reported knowledge and practices employed. *Journal of Vocational Rehabilitation*, *35*(1), 37–50.

Henricsson, L., & Rydell, A. (2004). Elementary school children and behavior problems: Teacher-child relations and self perception. A prospective study. *Merrill-Palmer Quarterly*, *50*, 111–138.

Hilton, A., & Liberty, K. (1992). The challenge of ensuring educational gains for students with severe disabilities who are placed in more integrated settings. *Education and Training of the Mentally Retarded*, *27*(2), 167–175.

Howell, E. (2010). *Elementary school children with autism spectrum disorders: Predictors of the student-teacher-relationship* (Unpublished doctoral dissertation). University of California, Riverside, CA.

Howell, E., Lauderdale-Littin, S., & Blacher, J. (2013). Educational placement for children with autism spectrum disorders: Social skills and behavior problems as predictors. *Education and Training in Autism and Developmental Disabilities*, *48*, 469–478.

Howes, C., Matheson, C. C., & Hamilton, C. E. (1994). Maternal, teacher, and child care history correlates of children's relationships with peers. *Child Development*, *65*, 264–273.

Howlin, P., Magiati, I., & Charman, T. (2009). Systematic review of early intensive behavioral interventions for children with autism. *American Journal on Intellectual and Developmental Disabilities*, *114*, 23–41.

Huemer, S. V., & Mann, V. (2010). A comprehensive profile of decoding and comprehension in autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *40*(4), 485–493.

Hughes, J. N. (2011). Longitudinal effects of teacher and student perceptions of teacher-student relationship qualities on academic adjustment. *Elementary School Journal, 112*, 38–60.

Individuals with Disabilities Education Improvement Act of 2004, Pub. L. No. 108-446. (2004). Retrieved from http://idea.ed.gov/explore/view/p/%2Croot%2Cstatute%2C

Justice, L. M., McGinty, A. S., Zucker, T., Cabell, S. Q., & Piasta, S. B. (2013). Bi-directional dynamics underlie the complexity of talk in teacher-child play-based conversations in classrooms serving at-risk pupils. *Early Childhood Research Quarterly, 28*, 496–508.

Kaat, A. J., Gadow, K. D., & Lecavalier, L. (2013). Psychiatric symptom impairment in children with autism spectrum disorders. *Journal of Abnormal Child Psychology, 41*(6), 959–969.

Kamps, D., Walker, D., Locke, P., & Delquadri, J. (1990). A comparison of instructional arrangements for children with autism served in a public school setting. *Education & Treatment of Children, 13*(3), 197–215.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child, 2*, 217–250.

Keen, D., Sigafoos, J., & Woodyatt, G. (2005). Teacher responses to the communicative attempts of children with autism. *Journal of Developmental and Physical Disabilities, 17*(1), 19–33.

Knight, E., Blacher, J., & Eisenhower, A. (2015). *Literacy development in autism: Predicting reading comprehension using AIMSWeb early literacy measures*. Unpublished manuscript.

Kobak, R. (1999). The emotional dynamics of disruptions in attachment relationships: Implications for theory, research, and clinical intervention. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 21–43). New York, NY: Guilford.

Koegel, L. K., & LaZebnik, C. (2004). *Overcoming autism*. New York, NY: Viking-Penguin.

Koegel, L., Matos-Freden, R., Lang, R., & Koegel, R. (2012). Interventions for children with autism spectrum disorders in inclusive school settings. *Cognitive and Behavioral Practice, 19*(3), 401–412.

Kogan, M. D., Blumberg, S. J., Schieve, L. A., Boyle, C. A., Perrin, J. M., Ghandour, R. M., . . . van Dyck, P. C. (2009). Prevalence of parent-reported diagnosis of autism spectrum disorder among children in the US, 2007. *Pediatrics, 124*, 1395–1403.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development, 70*, 1373–1400.

Lawton, K., & Kasari, C. (2012). Teacher-implemented joint attention intervention: Pilot randomized controlled study for preschoolers with autism. *Journal of Consulting and Clinical Psychology, 80*(4), 687–693.

Lemanek, K. L., Stone, W. L., & Fishel, P. T. (1993). Parent-child interactions in handicapped preschoolers: The relation between parent behaviors and compliance. *Journal of Clinical Child Psychology, 22*, 68–77.

Lerman, D. C., Vorndran, C. M., Addison, L., & Kuhn, S. (2004). Preparing teachers in evidence-based practices for young children with autism. *School Psychology Review, 33*(4), 510–526.

Leyfer, O. T., Folstein, S. E., Bacalman, S., Davis, N. O., Dinh, E., Morgan, J., . . . Lainhart, J. E. (2006). Comorbid psychiatric disorders in children with autism: Interview development and rates of disorders. *Journal of Autism and Developmental Disorders, 36,* 849–861.

Lindgren, K. A., Folstein, S. E., Tomblin, J. B., & Tager-Flusberg, H. (2009). Language and reading abilities of children with autism spectrum disorders and specific language impairment and their first-degree relatives. *Autism Research, 2*(1), 22–38.

Locke, J. J. (2010). *Teachers' perceptions of social skills in relation to perceived relationships: Analysis of elementary-aged children with autism spectrum disorder* (Unpublished doctoral dissertation). University of California, Los Angeles, CA.

Loiacono, V., & Valenti, V. (2010). General education teachers need to be prepared to co-teach the increasing number of children with autism in inclusive settings. *International Journal of Special Education, 25*(3), 24–32.

Longobardi, C., Prino, L. E., Pasta, T., Gastaldi, F. G. M., & Quaglia, R. (2012). Measuring the quality of teacher-child interaction in autistic disorder. *European Journal of Investigation in Health, Psychology and Education, 2*(3), 103–114.

Mahan, S., & Matson, J. L. (2011). Children and adolescents with autism spectrum disorders compared to typically developing controls on the Behavioral Assessment System for Children, Second Edition (BASC-2). *Research in Autism Spectrum Disorders, 5*(1), 119–125.

Mahoney, G. & Perales, F. (2003). Using relationship-focused intervention to enhance the social-emotional functioning of young children with autism spectrum disorders. *Topics in Early Childhood Special Education, 23*(2), 77–89.

Manti, E., Scholte, E. M., & Van Berckelaer-Onnes, I. A. (2013). Exploration of teaching strategies that stimulate the growth of academic skills of children with ASD in special education school. *European Journal of Special Needs Education, 28*(1), 64–77.

Marks, S. U., Schrader, C., & Levine, M. (1999). Paraeducator experiences in inclusive settings: Helping, hovering, or holding their own? *Exceptional Children, 65,* 315–328.

Mashburn, A., Hamre, B., Downer, J., & Pianta, R. (2006). Teacher and classroom characteristics associated with teachers' ratings of pre-kindergartners relationships and behaviors. *Journal of Psychoeducational Assessment, 24,* 367–380.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., . . . Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79*(3), 732–749.

Mayes, S. D., & Calhoun, S. L. (2003). Ability profiles in children with autism: Influence of age and IQ. *Autism, 7*(1), 65–80.

Mazefsky, C. A., Pelphrey, K. A., & Dahl, R. E. (2012). The need for a broader approach to emotion regulation research in autism. *Child Development Perspectives, 6*(1), 92–97.

McIntyre, L. L., Blacher, J., & Baker, B. L. (2006). The transition to school: Adaptation in young children with and without developmental disability. *The Journal of Intellectual Disability Research, 50,* 349–361.

Moes, D., & Frea, W. D. (2002). Contextualized behavioral support in early intervention for children with autism and their families. *Journal of Autism and Developmental Disorders*, *3*, 519–533.

Müller, E. (2004). Autism endorsements: State approaches. *National Association of State Directors of Special Education (NASDSE)*. Retrieved from http://www.projectforum.org/doc.stateapproachesautism.pdf

Murray, C., & Pianta, R. C. (2007). The importance of teacher-student relationships for adolescents with high incidence disabilities. *Theory into Practice*, *46*, 105–112.

Nation, K. (1999). Reading skills in hyperlexia: A developmental perspective. *Psychological Bulletin*, *125*, 338–355.

National Autism Center. (2009). *Findings and conclusions of the National Standards Project: Addressing the need for evidence-based practice guidelines for autism spectrum disorders*. Randolph, MA: National Autism Center.

National Institute of Child Health and Human Development. (2000). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups* (NIH Publication No. 00-4754). Washington, DC: U.S. Government Printing Office.

National Research Council (2001). *Educating children with autism*. Washington, DC: National Academy Press.

Newman, T. M., Macomber, D., Naples, A. J., Babitz, T., Volkmar, F., & Grigorenko, E. L. (2007). Hyperlexia in children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *37*(4), 760–774.

O'Connor, E., & McCartney, K. (2007). Examining teacher-child relationships and achievement as part of an ecological model of development. *American Educational Research Journal*, *44*(2), 340–369.

Odom, S. L., Vitztum, J., Wolery, R., Lieber, J., Sandall, S., Hanson, M. J., . . . Horn, E. (2004). Preschool inclusion in the United States: A review of research from an ecological systems perspective. *Journal of Research in Special Educational Needs*, *4*(1), 17–49.

Peisner-Feinberg, E. S., Burchinal, M. R., Clifford, R. M., Culkin, M. L., Howes, C., Kagan, S. L., . . . Yazejian, N. (2001). The relation of preschool child-care quality to children's cognitive and social developmental trajectories through second grade. *Child Development*, *72*, 1534–1553.

Pianta, R. C. (2001). *Student–Teacher Relationship Scale: Professional manual*. Odessa, FL: Psychological Assessment Resources Inc.

Pianta, R. C. (2010). Going to school in the United States: The shifting ecology of transition. In S. L. Kagan & K. Tarrant (Eds.), *Transitions for young children: Creating connections across early childhood systems* (pp. 33–44). Baltimore, MD: Paul H. Brookes Publishing.

Pianta, R. C., Cox, M. J., Taylor, L., & Early, D. (1999). Kindergarten teachers' practices related to the transition to school: Results of a national survey. *The Elementary School Journal*, *100*, 71–86.

Pianta, R. C., Steinberg, M. S., & Rollins, K. B. (1995). The first two years of school: Teacher-child relationships and deflections in children's classroom adjustment. *Development and Psychopathology*, *7*, 297–312.

Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review*, *33*, 444–458.

Pillay, M., Alderson-Day, B., Wright, B., Williams, C., & Urwin, B. (2011). Autism spectrum conditions—Enhancing nurture and development (ASCEND): An evaluation of intervention support groups for parents. *Clinical Child Psychology and Psychiatry*, *16*(1), 5–20.

Prino, L. E., Pasta, T., Gastaldi, F. G. M., & Longobardi, C. (2014). A study on the relationship between teachers and students with special needs. *International Journal of Developmental and Educational Psychology*, *1*(3), 119–127.

Reynolds, C. R., & Kamphaus, R. W. (2004). *BASC-2: Behavior Assessment System for Children, 2nd ed*. Circle Pines, MN: American Guidance Service.

Rieffe, C., Terwogt, M. M., & Kotronopoulou, K. (2007). Awareness of single and multiple emotions in high-functioning children with autism. *Journal of Autism and Developmental Disorders*, *37*(3), 455–465.

Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology*, *21*, 491–511.

Robertson, K., Chamberlain, B., & Kasari, C. (2003). General education teachers' relationships with included students with autism. *Journal of Autism and Developmental Disorders*, *33*(2), 123–130.

Rocha, M. L., Schreibman, L., & Stahmer, A. C. (2007). Effectiveness of training parents to teach joint attention in children with autism. *Journal of Early Intervention*, *29*, 154–172.

Rogers, S. J., Estes, A., Lord, C., Vismara, L., Winter, J., Fitzpatrick, A., . . . Dawson, G. (2012). Effects of a brief early start Denver model (ESDM)-based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry*, *51*(10), 1052–1065.

Rogers, S., & Vismara, L. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child & Adolescent Psychology*, *37*, 8–38.

Rudasill, K. M. (2011). Child temperament, teacher-child interactions, and teacher-child relationships: A longitudinal investigation from first to third grade. *Early Childhood Research Quarterly*, *26*, 147–156.

Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher-child relationships. *Attachment & Human Development*, *14*, 213–231.

Saft, E. W., & Pianta, R. C. (2001). Teachers' perceptions of their relationships with students: Effects of age, gender, and ethnicity of teachers and children. *School Psychology Quarterly*, *16*, 125–141.

Sansosti, J. M., & Sansosti, F. J. (2012). Inclusion for students with high-functioning autism spectrum disorders: Definitions and decision making. *Psychology in the Schools*, *49*(10), 917–931.

Shaufeli, W. B., & Van Dierendonck, D. (2000). *Handleiding van de Utrechtse Burnout schaal (UBOS)* [Manual of the Dutch Burnout Scale (UBOS)]. Lisse, the Netherlands: Swets & Zeitlinger.

Scheuermann, B., Webber, J., Boutot, E. A., & Goodwin, M. (2003). Problems with personnel preparation in autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, *18*(3), 197–206.

Schmitt, M. B., Pentimonti, J. M., & Justice, L. M. (2012). Teacher-child relationships, behavior regulation, and language gain among at-risk preschoolers. *Journal of School Psychology*, *50*(5), 681–699.

Segall, M. J., & Campbell, J. M. (2012). Factors relating to education professionals' classroom practices for the inclusion of students with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6, 1156–1167.

Seginer, R. (2006). Parents' educational involvement: A developmental ecology perspective. *Parenting: Science and Practice*, *6*(1), 1–48.

Serpell, Z. N., & Mashburn, A. J. (2012). Family-school connectedness and children's early social development. *Social Development*, *21*, 21–46.

Seskin, L., Feliciano, E., Tippy, G., Yedloutschnig, R., Sossin, K. M., & Yasik, A. (2010). Attachment and autism: Parental attachment representations and relational behaviors in the parent-child dyad. *Journal of Abnormal Child Psychology*, *38*(7), 949–960.

Sette, S., Spinrad, T. L., & Baumgartner, E. (2013). Links among Italian preschoolers' socioemotional competence, teacher–child relationship quality, and acceptance. *Early Education & Development*, *24*(6), 851–864.

Siller, M., & Sigman, M. (2002). The behaviors of parents of children with autism predict the subsequent development of their children's communication. *Journal of Autism and Developmental Disorders*, *32*, 77–89.

Silver, R. B., Measelle, J. R., Armstrong, J. M., & Essex, M. J. (2005). Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and the teacher-child relationship during the school transition. *Journal of School Psychology*, *43*(1), 39–60.

Silver, R. B., Measelle, J. R., Armstrong, J. M., & Essex, M. J. (2010). The impact of parents, child care providers, teachers, and peers on early externalizing trajectories. *Journal of School Psychology*, *48*, 555–583.

Simonoff, E., Pickles, A., Charman, T., Chandler, S., Loucas, T., & Baird, G. (2008). Psychiatric disorders in children with autism spectrum disorders: Prevalence, comorbidity, and associated factors in a population-derived sample. *Journal of the American Academy of Child & Adolescent Psychiatry*, *47*(8), 921–929.

Solomon, M., Ono, M., Timmer, S., & Goodlin-Jones, B. (2008). The effectiveness of parent-child interaction therapy for families of children on the autism spectrum. *Journal of Autism and Developmental Disorders*, *38*(9), 1767–1776.

Strain, P. S., & Bovey, E. (2011). Randomized, controlled trial of the LEAP model of early intervention for young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, *31*(3), 133–154.

Symes, W., & Humphrey, N. (2011). School factors that facilitate or hinder the ability of teaching assistants to effectively support pupils with autism spectrum disorders (ASDs) in mainstream secondary schools. *Journal of Research in Special Educational Needs*, *11*(3), 153–161.

Tews, L., & Lupart, J. (2008). Students with disabilities' perspectives of the role and impact of paraprofessionals in inclusive education settings. *Journal of Policy and Practice in Intellectual Disabilities*, *5*(1), 39–46.

Tsai, S., & Cheney, D. (2012). The impact of the adult-child relationship on school adjustment for children at risk for serious behavior problems. *Journal of Emotional and Behavioral Disorders*, *20*(2), 105–114.

U.S. Department of Education, Office of Special Education and Rehabilitative Services, Office of Special Education Programs (2009). *28th Annual Report to Congress on the Imple-mentation of the Individuals with Disabilities Education Act, 2006, 1*. Washington, DC: U.S. Government Printing Office.

Van Hooste, A., & Maes, B. (2003). Family factors in the early development of children with Down syndrome. *Journal of Early Intervention*, *25*(4), 296–309.

van Steensel, F. A., Bögels, S. M., & de Bruin, E. I. (2013). Psychiatric comorbidity in children with autism spectrum disorders: A comparison with children with ADHD. *Journal of Child and Family Studies*, *22*(3), 368–376.

Vazquez-Nuttall, E., Li, C., & Kaplan, J. P. (2006). Home-school partnerships with culturally diverse families: Challenges and solutions for school personnel. *Journal of Applied School Psychology*, *22*(2), 81–102.

Wechsler, D. (2002). *Wechsler Preschool and Primary Scale of Intelligence – Third Edition (WPPSI-III)*. San Antonio, TX: The Psychological Corporation.

Weitlauf, A. S., Vehorn, A. C., Taylor, J. L., & Warren, Z. E. (2012). Relationship satisfaction, parenting stress, and depression in mothers of children with autism. *Autism*, *18*(2), 194–198.

Wellman, H. M., & Liu, D. (2004). Scaling of theory of mind tasks. *Child Development*, *75*, 523–541.

Whalon, K. J. & Hart, J. E. (2011). Children with autism spectrum disorder and literacy instruction: An exploratory study of elementary inclusive settings. *Remedial and Special Education*, *32*(3), 243–255.

Whitby, P., & Mancil, G. (2009). Academic achievement profiles in children with high functioning autism and Asperger syndrome: A review of the literature. *Education and Training in Developmental Disabilities*, *44*(4), 551–560.

Wildenger, L. K., & McIntyre, L. L. (2012). Investigating the relation between kindergarten preparation and child socio-behavioral school outcomes. *Early Childhood Education Journal*, *40*(3), 169–176.

Wilkins, D. (2010). I'm not sure what I want (and I don't know how to get it): How do social care workers perceive the parental relationships of children with autistic spectrum conditions?. *Journal of Social Work Practice*, *24*(1), 89–101.

Williams, S. K., Johnson, C., & Sukhodolsky, D. G. (2005). The role of the school psychologist in the inclusive education of school-age children with autism spectrum disorders. *Journal of School Psychology*, *43*, 117–136.

Wong, V. N., & Kwan, Q. K. (2010). Randomized controlled trial for early intervention for autism: A pilot study of the Autism 1-2-3 project. *Journal of Autism and Developmental Disorders*, *40*(6), 677–688.

Zhang, X. (2011). Parent-child and teacher-child relationships in Chinese preschoolers: The moderating role of preschool experiences and the mediating role of social competence. *Early Childhood Research Quarterly*, *26*, 192–204.