Published in final edited form as:

Am J Intellect Dev Disabil. 2009 September ; 114(5): 322–339.

Student–Teacher Relationship Stability Across Early School Years for Children With Intellectual Disability or Typical Development

Jan Blacher,
University of California, Riverside

Bruce L. Baker, and
University of California, Los Angeles

Abbey S. Eisenhower
University of Massachusetts-Boston

Abstract

Student–teacher relationships of 37 children with moderate to borderline intellectual disability and 61 with typical cognitive development were assessed from child ages 6–8 years. Student–teacher relationship quality was moderately stable for the typical development group, but less so for the intellectual disability group. At each assessment these relationships were poorer for children with intellectual disability. Child behavior problems consistently predicted more conflict, whereas social skills predicted more closeness. Accounting for these child characteristics reduced the status group difference to nonsignificance. Earlier student–teacher relationships predicted subsequent changes in child behavior problems and social skills. Student–teacher relationships in the intellectual disability group were significantly lower for children in regular than special classes by age 8.

It is now well-established that positive student–teacher relationships in the early grades relate to multiple indicators of later school success, not only in academics (Hamre & Pianta, 2001; Pianta & Stuhlman, 2004) but also in socioemotional functioning (Decker, Dona, & Christenson, 2007). A key question, then, is, What child characteristics are predictive of a positive student–teacher relationship? In observational studies (Ladd, Birch, & Buhs, 1999; Ladd & Burgess, 2001), researchers have found that cognitive abilities of kindergarten children related positively to both student–teacher relationships and peer acceptance. There also is some evidence that children who enter kindergarten with developmental risk characteristics other than cognitive risk factors (e.g., behavior problems, low socio-economic status [SES]) will experience a less positive relationship with their teachers than will children who have more typical development (J. Baker, 2006).

In the present study, we examined the student–teacher relationships among children with intellectual disability, as well as a comparison group of children with typical development, from kindergarten through second grade. We expand on the “risk” literature by focusing on students with intellectual disability and build upon cross-sectional studies by examining stability in relationships with longitudinal methodology. We employed the Student–Teacher Relationship Scale—STRS (Pianta & Nemitz, 1991), the most widely used measure of such

relationships, assessing them from the perspective of the teacher. The STRS was designed to assess conflict, closeness, and dependency in the teacher's relationship with a particular child.

There is some evidence that student–teacher relationships are moderately stable across the early school years, despite the child usually having different teachers from year to year. O'Connor and McCartney (2006) followed 419 children across child care, kindergarten, and first grade. In regression analyses, controlling for many other variables, these investigators found that the quality of the student–teacher relationship in child care significantly predicted the student–teacher relationship in kindergarten and first grade, and the student–teacher relationship in kindergarten significantly predicted the relationship in first grade. Pianta and Stuhlman (2004) obtained teacher ratings for 490 children in preschool, kindergarten, and first grade (4, 5, and 6 years of age) and examined STRS subscales. Conflict scores were moderately correlated across time and teacher, $r_s = .32$ to $.40$, and correlations of closeness scores across time points were slightly lower, $r_s = .21$ to $.31$. The authors suggested that relational conflict may be more stable across teachers than is relational closeness because of the salience of stable child characteristics, such as temperament and behavior problems. Relational closeness, on the other hand, may depend more on the interpersonal styles of the teachers. Using repeated measures analyses, these researchers found that across the three assessments both Conflict and Closeness scores decreased slightly but statistically significantly, indicating that as these children got older and entered more structured school environments, their relationships with teachers were less conflictual, but also less close. The stability of student–teacher relationships when children have an intellectual disability has not been examined to our knowledge. In the present study, we analyzed the strength of associations from kindergarten to second grade.

If student–teacher relationships are stable to some degree, then what are the likely child risk factors that influence the quality of the relationship with each successive teacher? Among child and family demographics, gender, race, and SES have been implicated as risk factors. Student–teacher relationships have been reported to be poorer with boys than girls and with minority than white-non-Hispanic children (Birch & Ladd, 1997; Hamre & Pianta, 2001; Ladd et al., 1999). In these same studies, lower student–teacher relationships were found with children from families with fewer resources, such as low levels of family income or parental education. Also, there is considerable evidence that learning and/or behavioral risk factors adversely affect the student–teacher relationship; these are variously determined from low scores on school achievement tests, problems identified by standardized behavior rating scales, risk for referral to special education, or psychological referrals (Decker et al., 2007; Fergusson, Horwood, & Lynskey, 1994; Pianta, Nimetz, & Bennett, 1997). In a large cross-sectional study of risk within a sample of disadvantaged children, selected by eligibility for school lunch programs, J. Baker (2006) assessed 1,310 children from kindergarten through fifth grade. At every age, children who scored higher on academic and more favorably on behavioral indicators also had better student–teacher relationships. Moreover, the author noted that those children with developmental vulnerabilities who had positive relationships with their teachers were “significantly advantaged relative to similarly affected peers who lacked such relationships” (p. 224).

Child behavior problems have been found to have an especially adverse effect on early student–teacher relationships (Eisenhower Baker, & Blacher, 2007; Ladd et al., 1999; Ladd & Burgess, 1999; Murray & Murray, 2004; O'Conner & McCartney, 2006; Pianta, Steinberg, & Rollins, 1995). However, there is some evidence that, over time, student–teacher relationships also impact child behavior problems (e.g., Hamre & Pianta, 2001, 2005). In one encouraging study, Silver, Measelle, Armstrong, and Essex (2005) found that children with high initial externalizing behavior but also high student–teacher closeness decreased their externalizing behaviors from kindergarten through third grade. Another child domain that has received very little study is child social competence; in one study Eisenhower et al. (2007) found that student–

teacher relationships were lower for children with poor social skills, independent of behavior problems.

Following the logic of the studies cited above, we predicted that children with more than only at-risk status (e.g., those who already met diagnostic criteria for intellectual disability) would have poorer student–teacher relationships than would typically developing or mildly at-risk children. Children with intellectual disability are at heightened risk for clinically significant behavior problems (Dekker, Kost, VanderEnde, & Verhulst, 2002), roughly three times as high as their typical peers (Baker, Blacher, Crnic, & Edelbrock, 2002; Emerson, 2003). Moreover, an increasing percentage of children with intellectual disability are fully included in typical classrooms, especially in kindergarten and early elementary school. Given their cognitive disadvantage and heightened behavior problems, as well as typical classroom teachers' relatively more limited experience in educating children with disabilities, we anticipated greater dependency and conflict and less closeness in these student–teacher relationships. If poorer student–teacher relationships were found, it would be important to determine the extent to which they related to child characteristics, such as behavior problems and social skills, as well as to aspects of the educational setting, such as placement in special or regular education classrooms. In the present study, we considered both child and setting characteristics in relation to student–teacher relationships.

Two earlier reports from our longitudinal study of children with and without intellectual disability set the stage for the present study. Pianta's STRS was used in both studies. McIntyre, Blacher, and Baker (2006) examined adaptation to kindergarten for a subsample of children with intellectual disability ($n = 24$) or typical cognitive development ($n = 43$) and found that children with intellectual disability already had poorer teacher-reported student–teacher relationships relative to their typically developing peers. Eisenhower et al. (2007) subsequently examined all 140 children in the larger longitudinal sample when they had reached age 6 and were in kindergarten or first grade; these included most of the children who had been in the McIntyre et al. (2006) analyses one year earlier. Of these, 58 children had intellectual disability and 82 were typically developing. The children with intellectual disability had significantly poorer student–teacher relationships than did the typical 6-year-olds, with significantly higher scores on Conflict and Dependency and lower scores on Closeness. We examined concurrent (age 6) and early (age 3) predictors of student–teacher relationships. At age 6, three child measures each fully mediated (accounted for) the relationship between intellectual disability and student–teacher relationship quality: mother-reported behavior problems, teacher-reported behavior problems, and teacher-reported social skills. Moreover, children's self-regulatory skills assessed in laboratory tasks at age 3 were predictive of STRS scores at age 6 and fully mediated the relationship between intellectual disability status and student–teacher relationship quality. Thus, this study demonstrated the importance of child behavior problems and social skills, as well as the self-regulatory abilities that underlie both, for the prediction of student–teacher relationships, because these fully accounted for the lower student–teacher relationship quality for children with intellectual disability. Within-group analyses showed that these variables predicted student–teacher relationship quality for typical children as well as for those with intellectual disability.

In the present study, we expanded upon earlier findings to consider four primary questions involving student–teacher relationships examined longitudinally. The first three questions focused on children with intellectual disability in relation to children with typical development. Question 1: (a) Are STRS scores moderately stable across the early school years? and (b) Do intellectual disability group children continue to have lower STRS scores than do typical development group children? We examined STRS scores longitudinally across ages 6, 7, and 8 years. Question 2: Does student–teacher relationship quality continue to be accounted for by child behavior problems and social skill deficits across time? We examined the relationship

between teacher assessment of these child characteristics and STRS scores at each assessment. We also included three demographic variables (child gender and race, mother's last completed grade in school) as control variables. Question 3: Do earlier student–teacher relationships predict changes over time in child behavior problems and/or social skills? The fourth question involved only the subsample of children with intellectual disability; Question 4: Is classroom placement (regular vs. special education class) related to student–teacher relationship quality? Children with intellectual disability who are in mainstreamed settings might be expected to have lower STRS scores because they would be likely to have lower academic and social skills, and possibly higher behavior problems, relative to their typically developing classmates. We compared STRS scores for children who have intellectual disability and are in regular classes with children who have intellectual disability and are in special classes at ages 6, 7, and 8.

Method

Participants

Participants were 98 children with intellectual disability ($n = 37$) or typical development ($n = 61$) as well as their parents and teachers. Families had been recruited into a longitudinal study when the child was 3-years-old. The study from which this sample was drawn concerns the development of behavior problems and psychopathology in children with and without intellectual disability, and the sample was recruited at age 3 specifically to include children with intellectual disability as well as typical development. Families were from rural Pennsylvania (16%) and Southern California (84%). Families of children with intellectual disability were recruited primarily through regional agencies that provide and purchase diagnostic and intervention services for individuals with developmental disabilities. The families in this study were a subsample of the 140 participants in the Eisenhower et al. (2007) study at age 6. We included the 98 families for whom we had later obtained STRS measures at child ages 7 and 8 years. The present sample did not significantly differ from families without complete data on any variable assessed at age 6 that is reported on in the present study.

Children in the current sample were classified as having intellectual disability if, at age 5 years, they scored 84 or below on the Stanford-Binet Intelligence Scale-IV—Stanford-Binet (Thorndike, Hagen, & Sattler, 1986), a measure of cognitive functioning, and also scored 84 or below on the Vineland Adaptive Behavior Scales—VABS (Sparrow, Cicchetti, & Balla, 2005), a measure of adaptive functioning. Five children in the longitudinal sample with IQs below 85 were excluded from the present sample because their VABS score was greater than 84. Of the 37 children in the intellectual disability group, 9 scored in the borderline; 20, in the mild; and 8, in the moderate intellectual disability range (American Psychiatric Association, 2000). Children with borderline intellectual disability, as defined in the *Diagnostic and Statistical Manual of Mental Disorders—DSM IV-TR* (American Psychiatric Association, 2000), were included in the intellectual disability group, consistent with some previous reports from this longitudinal study (Blacher & Baker, 2007). Including borderline intellectual disability was deemed appropriate here in order to encompass the range of children whose low level of cognitive functioning is likely to interfere with their social and academic experiences in school. The diagnoses of the intellectual disability group were undifferentiated developmental delay (16); cerebral palsy (8), autism spectrum disorder/pervasive developmental disorders (6); other neurological disorders (4); and Down syndrome (3). The main outcome variable, the student–teacher relationship (described below), did not differ by diagnostic group. Children in the typical development group were recruited primarily through preschools and day care centers. They scored 85 or above on the Stanford-Binet at age 5, were not born prematurely, and did not have a developmental disability.

Table 1 shows child, parent, and classroom demographic characteristics by status group at child age 6, our initial focus of analyses. For the combined sample, 62% of the children were boys; by race and ethnicity, 59% were Caucasian; 17%, Hispanic; 6%, African American; and 17%, other or mixed ethnicities. Because recruitment had initially focused on intact families, 83% of mothers were married or living with a partner for at least 6 months. On average, mothers were 37.8 years old ($SD = 6.2$) and fathers, 40.3 years old ($SD = 6.6$). Overall, 45% of mothers and 60% of fathers had a bachelor's degree or further education. Sixty-six percent of families earned more than \$50,000 annually.

Mother's grade in school was unrelated to the dependent variables STRS Total, Conflict, and Closeness. Family income was unrelated to STRS Total or Conflict, but it was related significantly to closeness at ages 6 and 8; thus, income was covaried in analyses involving status (though with negligible effects).

The primary teacher was female for 96% of the children. All but 5 children in the sample were in kindergarten (79%) or first grade (16%); 4 children from the intellectual disability group were in preschool and 1 child from the typical development group was in second grade. As would be expected, children in the intellectual disability group were more likely to be in special education classes and were in smaller classes, with more teachers, on average. However, at age 6 years, 40.5% of the intellectual disability group children were in regular education classes. At age 6 only two teachers had more than 1 child in the total sample in their classrooms (2 each); at child age 7 no teacher had more than 1 participating child, whereas at child age 8, two teachers had more than 1 participating child (2 each). Due to the small degree of overlap in teachers, we did not nest our child data within classrooms.

Procedure

Data were obtained in a laboratory session (child age 5) and via parent-completed and teacher-completed questionnaires (ages 6, 7, and 8). All procedures were approved by the Institutional Review Boards of the three universities involved (Penn State University, UCLA, and UC Riverside). The longitudinal study began when the children were 3 years of age; informed consent was obtained at this time and again at child age 6 years, at the start of a continuation grant. At child age 5, families came to the center, where examiners administered the Stanford-Binet to the child, and the VABS to the mother. These measures were used to classify children as having intellectual disability or typical development.

At age 6, generally within 1 month of the child's 6th birthday, experimenters conducted home visits, at which time they collected parent-completed questionnaires. The age 6 teacher-report measures were completed in the spring of the school year, so that teachers would have sufficient time to get to know the child before completing the measures. Thus, teacher-report measures were mailed to teachers in the March closest to children's 6th birthday. For completion of school measures, parents were asked to designate the main classroom teacher (not aide or instructional assistant) with whom the child spent the most time. Parent and teacher measures were obtained at child ages 7 and 8 in the same way.

Measures

Stanford-Binet Intelligence Scale-4th Edition—This standardized test of intelligence is appropriate for children with and without intellectual disability; it yields a composite standard IQ with a mean of 100 and an SD of 16. It has high internal consistency (Glutting, 1989) and sufficient evidence for its validity (Thorndike et al., 1986). The Composite IQ was used to determine the intellectual disability status groups for the present study. Table 1 shows Stanford-Binet and VABS scores by status group.

Vineland Adaptive Behavior Scales—The VABS is a structured interview assessing the adaptive behavior of children and adults with or without disabilities. In the present study, mothers were respondents and the subscales used were Communication, Daily Living Skills, and Socialization. These were combined to form the adaptive behavior composite standard score ($M = 100$, $SD = 15$), with a Cronbach alpha coefficient of .93. The adaptive behavior composite standard score was used to confirm the intellectual disability status of children with Stanford-Binet scores of 84 or below.

Classroom Climate (Eisenhower et al., 2007)—This is a 12-item teacher-completed survey of the demographics of the child's school and classroom. A question about the respondent's classroom was used to classify the child with intellectual disability as being in a regular or special class. Another question was about the percentage of each day that the child spent in a regular classroom (< 25%, 26 to 50%; 51 to 75%; > 75%). This was used to further establish classroom placement category for children with intellectual disability.

The Student–Teacher Relationship Scale—The STRS is a 28-item self-report instrument designed to assess a teacher's perception of her or his relationship with a target student. Item scores range from 1 to 5 (1 = definitely does not apply; 2 = not really; 3 = neutral, not sure; 4 = applies somewhat; and 5 = definitely applies). This measure was designed to be used for children 3 to 8 years of age and contains three subscales: Conflict (12 items) measures the teacher's feelings of negativity and conflict with the student (e.g., “This child and I always seem to be struggling with each other”); Closeness (11 items), the teacher's feelings of affection and open communication with the student (e.g., “I share an affectionate, warm relationship with this child”); and Dependency (5 items), the teacher's perception of the student as overly dependent (e.g., “This child asks for my help when he/she really does not need help”). The total score can range from 28 to 140, with higher scores indicating a better student–teacher relationship. The score is computed using the following formula: Total Score = (72 – Conflict) + Closeness + (30 – Dependency). Pianta (2001) reported adequate reliability and validity. In the present sample, alphas were .86 (Conflict), .78 (Closeness), .57 (Dependency), and .73 (Total).

Teacher Report Form (TRF)—This teacher version of the Child Behavior Checklist—CBCL (Achenbach, 1991) is used extensively with school-age children (Achenbach, 2007). There are 112 items indicating child problems. The respondent indicates for each item whether now or within the past 2 months, the problem is (0) not true, (1) somewhat or sometimes true, or (2) very true or often true. The teacher report form of the CBCL produces a total behavior problems T score with a mean of 50 and an SD of 10, broadband externalizing problems and internalizing problems T scores, and eight narrowband scale scores. In the present study, we primarily utilized the total behavior problems T scores; in this sample, alpha was .95. In one analysis we also used the total T score of the parent-report CBCL, which is very similar.

Social Skills Rating System (SSRS)—Teacher—Child social skills were evaluated using the teacher form of the SSRS-T (Gresham & Elliott, 1990), which measures the domains of Cooperation (10 items), Assertion (10 items), and Self-Control (10 items). Scale scores can be converted to standard scores ($M = 100$, $SD = 15$), with higher scores indicating better social skills. The Social Skills total standard score, used in the present analyses, had an alpha of .94 in the standardization sample (Gresham & Elliott, 1990). In one analysis we also used the parent version (SSRS-P), which is very similar.

Results

Preliminary Analyses

Analyses included Pearson correlations, independent sample *t* tests, and hierarchical multiple linear regressions. We examined the distributions of the primary variables (STRS Total, Conflict, and Closeness; TRF Total; SSRS Total) at each of the three time points (child ages 6, 7, and 8). Data points that were more than 3 *SDs* above or below the mean of a variable were considered to be outliers. Seven data points were determined to be outliers; all were extreme in the high direction. As suggested by Cohen, Cohen, West, and Aiken (2002), all outliers were set equal to plus 3 *SDs* from the mean in order to reduce the influence of extreme data points.

We examined the intercorrelations of the three subscales of the dependent variable, student–teacher relationships, at child ages 6, 7, and 8. Conflict and Closeness were modestly negatively related; correlations at ages 6 and 7 were $-.38, p < .001$, each. At child age 8, the correlation of $-.20$ was not significant. Dependency was unrelated to Closeness at all three ages. Dependency was moderately related to Conflict; correlations ranged from $.45$ to $.57$, all $ps < .001$. In reporting analyses involving the student–teacher relationships, we have included the Total score, Conflict, and Closeness. Consistent with the literature, we have not included analyses of Dependency to save space, but also because this scale is short (5 items), has the lowest alpha, is difficult to interpret, and has findings parallel to those for Conflict.

Stability of Student–Teacher Relationship Ratings Across Three Child Ages

Table 2 shows the correlations of STRS scores across child ages. Total score correlations indicated moderate stability, ranging from $r = .44$ to $.52$, in the combined sample. Total score stability was moderate in the typical development sample, all $ps < .001$, but lower and nonsignificant in the intellectual disability sample. Although the stability was greater in the typical development than intellectual disability group, the difference between status group correlations was only significant between ages 7 and 8 (computed from Preacher, 2002). Considering STRS subscales, we found that conflict stability was high for the typical development group (ranging from $.52$ to $.66, p < .001$). Stability coefficients for the intellectual disability group were not significant and were significantly lower than coefficients for the typical development group between ages 6–7 and 7–8. Closeness stability was moderate and similar for the two status groups.

Because it was possible that having the same teacher at two annual assessments would result in higher stability in STRS scores, this was examined. Only a minority of children in the combined sample had the same teacher at ages 6 and 7 (18%) or ages 7 and 8 (13%). Separate student–teacher relationship total correlations were run for children with the same teacher versus different teachers across the assessment points. From age 6 to 7, the correlations were virtually the same, $r = .49$ same teacher, $.47$ different. From age 7 to 8, contrary to expectations, the correlation was lower with the same teacher, $r = .30$, than with different teachers, $r = .51$, although not significantly so.

Status Group Differences in Student–Teacher Relationships Across Child Ages 6, 7, and 8

Table 2 also shows means and *SDs* across time for STRS variables for intellectual disability and typical development groups. The STRS total scores are also shown graphically in Figure 1. Independent *t* tests by status at each age showed the intellectual disability group to have significantly lower STRS total scores than did the typical development group. Considering subscales, the reported teacher relationships were poorer with intellectual disability group children in every case, with six of the nine *t* tests reaching statistical significance. Conflict was marginally higher at age 6 and significantly higher at ages 7 and 8. Dependency (not shown in Table 2) also was marginally higher at age 6, $t = 1.85, p = .07$, and significantly higher at ages

7 and 8, $t_s = 4.12$ and 4.15 , respectively, $ps < .001$. Closeness was significantly lower at ages 6 and 7 but not at age 8. Thus, the status group differences found when children entered school were maintained across the next 2 years.

In the present combined sample, the 50th percentiles were 119, 116, and 116.5 across time (ages 6, 7, and 8 years). The typical development group medians were at the 64th, 62nd, and 65th percentiles, respectively, of the combined sample, whereas the intellectual disability group medians were at the 33rd, 32nd, and 33rd percentiles, respectively. By way of comparison, in Pianta's (2001) normative sample of children 4 to 8 years old, the 50th percentile score was 117 (shown in Figure 1).

STRS and Child Characteristics: Behavior Problems, Social Skills, and Demographics

Table 2 also shows stability across assessment points for teacher-rated child behavior problems and social skills. The combined sample means were highly similar across child ages for both measures and the inter-age correlations were moderate to high, even though assessments were 1 or 2 years apart and usually completed by different teachers. Typical development group means were significantly lower for behavior problems and higher for social skills than were the means of intellectual disability group scores on every measure. Typical development stability coefficients for behavior problems were higher than intellectual disability coefficients, and significantly so at age 8 years. Typical development and intellectual disability stability for social skills scores were similar.

Interrelationships among the teacher measures were examined in the combined sample. Child behavior problems and social skills were highly negatively correlated at the child ages 6, 7, and 8 year assessments, $r_s = -.75, -.76$, and $-.72$, respectively, all $ps < .001$. Child behavior problems were highly negatively related to the concurrent STRS Total scores, at the ages 6, 7, and 8 year assessments, $r_s = -.71, -.66$, and $-.75$, respectively, all $ps < .001$. Child social skills were highly positively related to the concurrent STRS Total scores, at the age 6, 7, and 8 year assessments, $r_s = .60, .62$, and $.69$, respectively, all $ps < .001$. Table 3 shows correlations between the predictor variables of interest (child demographics, status group, behavior problems, and social skills) and STRS Total, Conflict, and Closeness scores.

To examine the relative contributions of these child characteristics to STRS Total, Conflict, and Closeness scores, we ran hierarchical regression analyses at each assessment point, with the STRS scores as the dependent variables. In each regression, the demographic variables child gender, child race (Caucasian, non-Hispanic vs. non-Caucasian) and mother's last completed grade in school were entered in Step 1. Status group (typical development, intellectual disability) was entered in Step 2. Behavior problems and social skills were converted to z scores and entered in Step 3. The Behavior Problems $\times$ Status Group and the Social Skills $\times$ Status Group interactions, created by multiplying the z scores, were entered in Step 4. Table 4 shows the standardized beta weights in the final model at each child age; the interaction terms are not included, as neither approached significance at any age. The demographic variables of child age and mother education were unrelated to STRS scores. Gender was significantly related to closeness at ages 7 and 8, with teachers reporting greater closeness with girls than with boys. Status group had some modest relationships with STRS scores. Child behavior problems were significantly related to STRS Total at each assessment, and child social skills, although a trend at age 6, contributed significantly at ages 7 and 8. Subscale analyses, however, made the role of these child characteristics clearer. Conflict was strongly predicted by behavior problems but not by social skills, whereas closeness was strongly predicted by social skills but not by behavior problems. The proportions of STRS total variance explained by the variables of interest were 53%, 53%, and 64%.

All of the primary variables of interest were gathered from teachers, introducing the problem of shared method variance. Fortunately, we had parent-report versions of the CBCL and the SSRS, although they were obtained up to 6 months apart from the teacher measures. To consider these independent measures, we re-ran the above hierarchical regressions, substituting mothers' reported behavior problems and social skills scores for those of the teachers. In the final model, mother-reported behavior problems entered significantly for STRS Total and Conflict scores in all three analyses but did not enter in any Closeness analysis. Neither status group nor social skills entered in any analysis. Although there was significant variance explained at each assessment, the percentages decreased considerably from the analyses using teacher data to 19%, 35%, and 15%, respectively.

STRS and Child Outcomes

We examined whether earlier student–teacher relationships (at ages 6 and 7 combined) were predictive of later teacher reported child behavior problems and/or social skills (at age 8). First, we converted the STRS Total scores at ages 6 and 7 to z scores and summed them for a combined measure of the student–teacher relationships over these 2 years. Next, we multiplied this z score by the two-level status z score (intellectual disability, typical development) to create an interaction term. We then ran two hierarchical multiple regressions; final model standardized Betas are shown in Table 5. For the first analysis the dependent variable was the TRF Total score at age 8. We entered the TRF Total score at age 6 in Step 1, the z scores for status group and the STRS variable in Step 2, and the STRS $\times$ Status Group interaction in Step 3 (to determine whether the prediction was different in the two status groups). In the final model, accounting for 47% of the variance, age 8 behavior problems were significantly associated with age 6 behavior problems, $p < .05$, but also associated significantly with the earlier STRS score, $p = .001$, and status group, $p < .01$. Children with lower student–teacher relationships at age 6–7 and/or children with intellectual disability showed significantly greater increase in behavior problems by age 8. The interaction term did not approach significance, indicating that the student–teacher relationships did not operate differently for children with typical development and intellectual disability. We ran a parallel regression analysis to predict child social skills at age 8. In this final model, accounting for 49% of the variance, age 8 social skills were significantly associated with age 6 social skills, $p < .001$, but also associated significantly with the STRS combined score, $p < .01$. Children with lower student–teacher relationships at age 6–7 showed significantly less gain in social skills assessed at age 8. Neither status group nor the interaction term was significant. Thus, better earlier student–teacher relationships (generally in kindergarten and first grade) predicted decreased externalizing and internalizing problem behaviors and increased social skills by the age 8 (generally second grade) assessment.

In the analyses above, we used the TRF Total score to represent behavior problems. We also ran all analyses separately using the TRF Externalizing and Internalizing broadband scores to determine whether either type of behavior problem was more predictive of STRS scores. Overall, Externalizing scores tended to be related more strongly to student–teacher relationships. In analyses by child age, parallel to those reported in Table 4, Internalizing TRF scores were significant only at child age 6 for STRS Total and Conflict scores, whereas Externalizing TRF scores were significant, $p < .001$, at every age for STRS Total and Conflict scores. Consistent with Table 5, STRS Closeness scores were not related to either broadband score. In analyses predicting child age 8 behavior problems from child age 6 student–teacher relationships, parallel to those in Table 5, STRS combined scores predicted changes in both Externalizing, unstandardized beta = $-.42$, $p < .01$, and Internalizing, unstandardized beta = $-.25$, $p < .05$. Status group did not enter into either equation.

STRS and Classroom Setting for Children With Intellectual Disability

We examined whether the classroom placement of children with intellectual disability was related to the teachers' perception of the student–teacher relationships. All children in the intellectual disability group had special education eligibility. The classroom setting variable was determined by the setting in which the student spent the most time: special education classroom ($\leq 50\%$ in regular classroom) or regular classroom ($> 50\%$ in regular classroom). The percentage of children with intellectual disability spending greater than 50% of their school day in a regular class was 40.5 at age 6, 31.4 at age 7, and 25.7 at age 8 (linear time effect, $F [1, 34] = 5.67, p = .02$). These students were in the highest regular classroom category ($> 75\%$ of their day) except for 1 child at age 6, 2 at age 7, and 1 at age 8. Children with intellectual disability in a regular classroom at age 8 were primarily in the borderline intellectual disability group ($n = 7$), with 3 in the mild and none in the moderate intellectual disability groups.

The STRS was completed by the teacher in the child's primary classroom in all but one case at each time point; these exceptions were excluded from the analysis. Table 6 shows total STRS scores for the children with intellectual disability at ages 6, 7, and 8 years by type of classroom. Children with intellectual disability who were in regular classrooms received progressively lower total STRS scores over time; by age 8, this classroom setting difference was marginally significant, $t = 2.01, p = .05$. With regard to subscales, the STRS Conflict score did not differ at any age; the Closeness score (not shown) was significantly lower for children with intellectual disability in the regular classroom at age 6, $t = 2.10, p = .04$, and age 7, $t = 2.74, p = .01$; at age 8, the difference was not significant. In examining the classroom placement further, we found that teacher-rated social skills, as well as Total and Externalizing behavior problems did not significantly differentiate children with intellectual disability in the two types of classroom at any age; Internalizing behavior problem scores were higher for children with intellectual disability in the regular classroom at age 8, $t = 2.15, p = .04$. However, Stanford-Binet scores, which had been assessed at child age 5 years, were significantly higher for children with intellectual disability in the regular education classroom than in the special education classroom at every age. Thus, in these exploratory analyses, by the third year of school (mostly second grade), the children who were still mainstreamed had higher cognitive ability but also marginally poorer student–teacher relationships compared with children who have intellectual disability and were in special education classes.

Discussion

We assessed the student–teacher relationship quality for children with intellectual disability and a comparison group of children with typical development. Eisenhower et al. (2007) previously reported that student–teacher relationship quality was lower at age 6 for a sample of children with intellectual disability than for their typically developing peers. We followed this sample over the subsequent 2 years and addressed four primary questions. The first question asked whether student–teacher relationship quality would be moderately stable over time and whether the lower student–teacher relationship quality for children with intellectual disability would continue. Correlations across time were moderate for children with typical development but lower for those with intellectual disability. Teachers of children with intellectual disability continued to report poorer quality student–teacher relationships across the early elementary school years. These children experienced significantly less student–teacher closeness and more conflict and dependency each year relative to their typically developing peers. We note that our intellectual disability sample (with IQs from the moderate to borderline range) did not include children with severe or profound intellectual disability, and, thus, we do not know whether the present findings would generalize to teachers of children with more severe levels of intellectual disability.

This pattern of negative relationships over time could be hypothesized to have a cumulative impact on these children's sense of self-worth, social development, attachment style with adults, and school engagement, taking an increasingly greater toll on their ability to form relationships and relate positively with authority figures. These concerns were voiced by Howes, Phillipsen, and Peisner-Feinberg (2000), who reported consistency in teacher–child relationships from preschool to kindergarten and interpreted this as children developing models of teacher–child relationships in early childhood and then applying these models to subsequent kindergarten relationships. Although in the present study we can only speak about the impact of negative student–teacher relationships on the child's behavior problems and social skills (see below), future researchers could examine whether poorer quality early student–teacher relationships exact a cumulative impact on the psychological, relational, and academic adjustment of children with intellectual disability and the mechanisms involved. In such research investigators might also examine the extent to which one or more experiences of a more positive relationship with a teacher can compensate for this effect and buffer children against a prolonged pattern of strained student–teacher relationships over time.

The second question asked whether the status group differences in student–teacher relationship quality continued to be accounted for by child behavior problems and social skill deficits. Consistent with earlier research assessing these factors at age 6 (Eisenhower et al., 2007), we continued to find that differences in the student–teacher relationship quality between the intellectual disability and typical development groups were not due primarily to the IQ difference between them, but, rather, to the greater behavior problem excesses and social skill deficits present in the intellectual disability sample. Thus, even as children get older and academic skills take on increasing importance in the classroom, children with intellectual disability continue to be most hindered by behavioral and social factors when it comes to building relationships with teachers. This finding is consistent with Hastings and Brown's (2002) study of teacher burnout, where child behavior problems were associated with special education teachers' emotional exhaustion. It is also consistent with related research on the impact on parents of raising a child with intellectual disability, where parenting stress is attributable more to behavior problems and social skill deficits than to intellectual disability (B. Baker et al., 2003; Floyd & Gallagher, 1997; Neece & Baker, 2008), as well as a study of children with autism spectrum disorder, in which Lecavalier, Leone, and Wiltz (2006) found that externalizing behavior problems were associated with parent and teacher stress more than any other child or caregiver characteristic measured.

Although the STRS measure is usually considered as a Total score, there appears to be value in examining the subscales of Conflict and Closeness because the correlates of these subscales differed. In final regression models, child behavior problems, but not social skills, were associated with teacher-reported conflict at all three ages. Conversely, child social skills, but not behavior problems, were associated with teacher-reported closeness at all three ages.

In the present analyses, teacher-rated behavior problems and social skills accounted for about half of the STRS variance. Yet, it seems reasonable that teacher characteristics and contextual factors that were not examined here would account for student–teacher relationship variance beyond child behavior problems and social skills. Several researchers in studies of children with typical development have examined teacher characteristics and found that, beyond child variables, lower student–teacher relationships are predicted when teachers hold authoritarian attitudes, report more depression and lower self-efficacy, and/or are observed to provide less emotional support in the classroom (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Hamre & Pianta, 2004; Hamre, Pianta, Downer, & Mashburn, 2008; Pianta et al., 2005). Too, contextual variables, such as teacher training, ancillary staff, other classroom resources, institutional support, or classroom composition, would likely impact student–teacher relationships. In a large-scale study of kindergarten classrooms in Belgium, Buyse et

al. (2008) found that teachers in classrooms in which students were generally high in externalizing and internalizing behavior problems had poorer student–teacher relationships, especially with children who themselves exhibited high externalizing behaviors. Future investigators could profitably explore teacher and school characteristics together with the child characteristics we considered in the present study.

We also examined the relationship of student–teacher quality to three child demographic characteristics found by other researchers to relate to student–teacher relationships (Birch & Ladd, 1997; Hamre & Pianta, 2001; Ladd et al., 1999). Here, neither child race/ethnicity nor mother's education related to STRS score at any time point. Child gender related to STRS Total score at age 7 (first grade), and to the Closeness subscale at ages 7 and 8, with teachers reporting higher quality relationships with girls. O'Connor and McCartney, reporting on a much larger sample, found this same child gender relationship only in first grade.

The third question asked whether earlier student–teacher relationships related to changes in child behavior problems and/or social skills over time. We have cited some evidence that early student–teacher relationships impact later child behavior problems (Hamre & Pianta, 2001, 2005; Silver et al., 2005), but this subsequent impact had not been studied in children with intellectual disability or in the domain of social skills. Our analyses indicated that more positive student–teacher relationships reported by teachers at child ages 6 and 7 years combined were significantly associated with decreases in behavior problems as well as increases in social skills by age 8. These associations were not influenced by whether the child had typical development or intellectual disability. It is of note that when one studies student–teacher relationships over time, the usual case is that children have different teachers every year. Finding predictive associations should be more difficult, to the extent that different teacher characteristics and contextual variables beyond the child's characteristics also influence teacher ratings at each point. Thus, the present findings suggest a prominent role of child characteristics in affecting teacher–student relationships.

The fourth question considered the classroom context to ascertain whether placement of children with intellectual disability in a regular versus special education class is related to student–teacher relationship quality. This question was exploratory, given the modest sample size and the absence of measures of teacher characteristics. Interestingly, we found that children with intellectual disability in mainstream classrooms had poorer student–teacher relationships, which reached borderline statistical significance at age 8 years. This difference occurred despite the facts that the mainstreamed children did not differ from their special class peers in behavior problems or social skills and that they had higher IQs. This finding, if replicated, would be of some concern, given the strong advocacy to place children with intellectual disability in mainstreamed classroom settings whenever possible. Although a mainstream environment may have many advantages not assessed here, it also may confer a heightened risk for poorer student–teacher relationships. Future research is needed in which investigators focus specifically on the relationship experiences of mainstreamed children with intellectual disability in the classroom. These exploratory findings would need to be replicated with a larger sample of children and, perhaps, limited to children with mild intellectual disability because most of the age 8 children in the regular classroom were classified as having borderline intellectual disability. Determining what might be the most advantageous educational environment for children with borderline intellectual disability is a separate, but important, research focus. Moreover, in further studies researchers could determine the teacher, classroom, and peer variables that might affect classroom adjustment. In particular, there is likely to be great variability among general education teachers regarding their level of training and experience specific to educating children with intellectual disability. Related research suggests that teachers with less overall teaching experience have students who encounter more problems adjusting to school (Pianta, Cox, Taylor, & Early, 1999). Other factors that might

influence the student–teacher relationships of children with intellectual disability in mainstream classrooms include teachers' (a) attitudes and attributions regarding children's intellectual disability or behavior problems, (b) training in behavior management strategies, and (c) behavioral and academic expectations.

One limitation of the present study is reliance primarily on teachers' reports for both the outcome variable (student–teacher relationship quality) and the predictor variables (e.g., behavior problems, social skills). We addressed shared method variance by substituting mother measures. Although mothers' reports of behavior problems also related to student–teacher relationship quality, the variance explained was considerably less. The difference is important to note but difficult to interpret, not only because mothers and teachers saw the child in very different contexts and with measures sometimes taken months apart, but also because these measures are, to some degree, perceptions rather than objective indicators. The literature would be strengthened by studies including classroom observational measures of behavior problems, social skills, and student–teacher relationship quality as well as parent and/or child perspectives on the quality of the student–teacher relationship.

Implications for Intervention

The present findings underscore the importance of early intervention efforts for children with intellectual disability that are aimed not only at developing cognitive capacities, but also at reducing child behavior problems and building social competence (Baker & Feinfield, 2007). Effective programs prior to school entry and throughout early elementary school could help equip children for positive student–teacher interactions. Although early intervention programs for children who are at risk or developmentally delayed have been deemed effective (Shonkoff & Meisels, 2000), the focus and best outcomes have been in the cognitive, rather than socioemotional, domain (Blok, Fukkink, Gebhardt, & Leseman, 2005). Early child intervention programs that promote children's behavioral and emotional self-regulation and social competence, in addition to cognitive development, could reduce the challenges that we have found to drive much of the student–teacher relationship. There is considerable evidence that parent training/education programs involving families of children at early school ages are effective in directly reducing child behavior problems and indirectly reducing parenting stress (Feinfield & Baker, 2004), which exacerbate child difficulties and social skills deficits (Neece & Baker, 2008).

With regard to the school's contribution, the studies discussed above highlight the importance of breaking the cycle of poor relationships for children with intellectual disability. Interventions that are focused on the child domains that relate to student–teacher relationship and/or on building teachers' skills for relating to children with intellectual disability may be especially effective, particularly for children with borderline or mild intellectual disability, who are more likely to be mainstreamed for much of the day. Although there are few such programs focused on intellectual disability, a number of school-based programs primarily for young typically developing children concentrate on supporting children's socioemotional development (Fox & Hemmeter, 2009; Reid, Webster-Stratton, & Hammond, 2007). Given the high rates of some degree of inclusion of young children with milder intellectual disability, it is important to assess whether these types of programs benefit them as well.

Also, planners of school intervention programs have attempted, with some success, to ensure that at-risk children have at least one positive adult–child relationship at school as a means of improving school engagement. For example, in the Check & Connect program, Sinclair, Christenson, Evelo, and Hurley (1998) assigned middle school students with disabilities to a monitor, who served as a source of support and school connectedness. The monitor checked in with the student at least monthly to evaluate his or her progress, encourage the student's continued school engagement, and help the student to problem-solve about school issues. The

researchers found that by 9th grade, the treatment group children, compared to controls, were showing improved school engagement—including greater academic competence, fewer behavior problems, and greater likelihood of completing homework. The challenges facing younger children with intellectual disability differ markedly from those of middle school students, however, and it remains to be seen whether the presence of this type of support person, or a different intervention, could improve the school trajectory of younger, elementary-age children with intellectual disability.

Acknowledgments

The project described here was supported by Award R01HD034879 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health and Human Development or the National Institutes of Health. This article is based on the activities of the Collaborative Family Study (Keith Crnic, principal investigator; Bruce L. Baker, Jan Blacher, and Craig Edelbrock, co-principal investigators). This study has been conducted at three sites: Pennsylvania State University; University of California, Los Angeles; and University of California, Riverside. We appreciate the assistance of the Collaborative Family Study staff and research assistants and are especially grateful for the participation of the families and teachers who were so generous with their time.

References

- Achenbach, TM. Manual for the Teacher's Report Form and 1991 Profile. Burlington: University of Vermont, Department of Psychiatry; 1991.
- Achenbach, TM. Applications of the Achenbach System of Empirically Based Assessment to children, adolescents, and their parents. In: Smith, SR.; Handler, L., editors. *The clinical assessment of children and adolescents: A practitioner's handbook*. Hillsdale, NJ: Erlbaum; 2007. p. 327-344.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. Vol. 4th. Arlington, VA: Author; 2000. Text rev.
- Baker BL, Blacher J, Crnic KA, Edelbrock C. Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal on Mental Retardation* 2002;107:433–444. [PubMed: 12323068]
- Baker, BL.; Feinfeld, KA. Early intervention and parent education. In: O'Reilly, G.; Walsh, P.; Carr, A.; McEvoy, J., editors. *The handbook of intellectual disability and clinical psychology practice*. London: Brunner-Routledge; 2007. p. 336-370.
- Baker BL, McIntyre LL, Blacher J, Crnic K, Edelbrock C, Low C. Preschool children with and without developmental delay: Behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research* 2003;47:217–230. [PubMed: 12787154]
- Baker J. Contributions of teacher-child relationships to positive school adjustment during elementary school. *Journal of School Psychology* 2006;44:211–229.
- Birch SH, Ladd GW. The teacher-child relationship and children's early school adjustment. *Journal of School Psychology* 1997;35:61–79.
- Blok H, Fukkink RG, Gebhardt EC, Leseman PPM. The relevance of delivery mode and other programme characteristics for the effectiveness of early childhood intervention. *International Journal of Behavioral Development* 2005;29:35–47.
- Buyse E, Verschueren K, Doumen S, Van Damme J, Maes F. Classroom problem behavior and teacher-child relationships in kindergarten: The moderating role of classroom climate. *Journal of School Psychology* 2008;46:367–391. [PubMed: 19083364]
- Decker DM, Dona DP, Christenson SL. Behaviorally at-risk African American students: The importance of student-teacher relationships for student outcomes. *Journal of School Psychology* 2007;45:83–109.
- Dekker MC, Koot HM, van der Ende J, Verhulst FC. Emotional and behavioral problems in children and adolescents with and without intellectual disability. *Journal of Child Psychology and Psychiatry* 2002;43:1087–1098. [PubMed: 12455929]

- Eisenhower AS, Baker BL, Blacher J. Early student-teacher relationships of children with and without intellectual disability: Contributions of behavioral, social, and self-regulatory competence. *Journal of School Psychology* 2007;45:363–383.
- Emerson E. Prevalence of psychiatric disorders in children and adolescents with and without intellectual disability. *Journal of Intellectual Disability Research* 2003;47:51–58. [PubMed: 12558695]
- Feinfield KA, Baker BL. Empirical validation of a treatment for families of young children with externalizing problems. *Journal of Clinical Child and Adolescent Psychology* 2004;33:182–195. [PubMed: 15028552]
- Fergusson DM, Horwood LJ, Lynskey MT. A longitudinal study of early childhood education and subsequent academic achievement. *Australian Psychologist* 1994;29:110–115.
- Floyd FJ, Gallagher EM. Parental stress, care demands, and use of support services for school-age children with disabilities and behavior problems. *Family Relations* 1997;46:359–371.
- Fox, L.; Hemmeter, M. A programwide model for supporting social emotional development and addressing challenging behavior in early childhood settings. In: Sailor, W.; Dunlap, G.; Sugai, G.; Horner, R., editors. *Handbook of positive behavior support*. New York: Springer; 2009. p. 177–202.
- Glutting JJ. Introduction to the structure and application of the Stanford-Binet Intelligence Scale-Fourth Edition. *Journal of School Psychology* 1989;27:69–80.
- Gresham, FM.; Elliott, S. *Social Skills Rating System*. Circle Pines, MN: American Guidance Service; 1990.
- Hamre BK, Pianta RC. Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development* 2001;72:625–638. [PubMed: 11333089]
- Hamre BK, Pianta RC. Self-reported depression in non-familial caregivers: Prevalence and associations with caregiver behavior in child-care settings. *Early Childhood Research Quarterly* 2004;19:297–318.
- Hamre BK, Pianta RC. Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development* 2005;76:949–967. [PubMed: 16149994]
- Hamre BK, Pianta RC, Downer JT, Mashburn AJ. Teachers' perceptions of conflict with young students: Looking beyond problems behaviors. *Social Development* 2008;17:115–136.
- Hastings RP, Brown T. Coping strategies and the impact of challenging behaviors on special educators' burnout. *Mental Retardation* 2002;40:148–156. [PubMed: 11925269]
- Howes C, Phillipsen LC, Peisner-Feinberg E. The consistency of perceived teacher-child relationships between preschool and kindergarten. *Journal of School Psychology* 2000;38:113–132.
- Ladd GW, Birch SH, Buhs ES. Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development* 1999;70:1373–1400. [PubMed: 10621962]
- Ladd GW, Burgess KB. Charting the relationship trajectories of aggressive, withdrawn, and aggressive/withdrawn children during early grade school. *Child Development* 1999;70:910–929. [PubMed: 10446726]
- Ladd GW, Burgess KB. Do relational risks and protective factors moderate the linkages between childhood aggression and early psychological and school adjustment? *Child Development* 2001;72:1579–1601. [PubMed: 11699688]
- Lecavalier L, Leone S, Wiltz J. The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *Journal of Intellectual Disability Research* 2006;50:172–183. [PubMed: 16430729]
- McIntyre LL, Blacher J, Baker BL. The transition to school: Adaptation in young children with and without intellectual disability. *Journal of Intellectual Disability Research* 2006;50:349–361. [PubMed: 16629928]
- Murray C, Murray KM. Child level correlates of teacher-student relationships: An examination of demographic characteristics, academic orientations, and behavioral orientations. *Psychology in the Schools* 2004;41:751–762.
- Neece CL, Baker BL. Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behaviour problems and social skills. *Journal of Intellectual Disability Research* 2008;52:1114–1128. [PubMed: 18513339]

- O'Connor E, McCartney K. Testing associations between young children's relationships with mothers and teachers. *Journal of Educational Psychology* 2006;98:87–98.
- Pianta, RC. The Student–Teacher Relationship Scale. Charlottesville: University of Virginia; 2001.
- Pianta RC, Cox MJ, Taylor L, Early D. Kindergarten teachers' practices related to the transition to school: Results of a national survey. *Elementary School Journal* 1999;100:71–86.
- Pianta RC, Howes C, Burchinal M, Bryant D, Clifford R, Early C, et al. Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science* 2005;9:144–159.
- Pianta RC, Nimetz SL. Relationships between children and teachers: Associations with classroom and home behavior. *Journal of Applied Developmental Psychology* 1991;12:379–393.
- Pianta RC, Nimetz SL, Bennett E. Mother–child relationships, teacher–child relationships, and school outcomes in preschool and kindergarten. *Early Childhood Research Quarterly* 1997;12:263–280.
- Pianta RC, Steinberg MS, Rollins KB. The first two years of school: Teacher-child relationships and deflections in children's classroom adjustment. *Development and Psychopathology* 1995;7:297–312.
- Pianta RC, Stuhlman MW. Teacher-child relationships and children's success in the first years of school. *School Psychology Review* 2004;33:444–458.
- Preacher, KJ. Calculation for the test of difference between two independent correlation coefficients (Computer software). 2002. Available from <http://www.quantpsy.org>
- Reid MJ, Webster-Stratton C, Hammond M. Enhancing a classroom social competence and problem-solving curriculum by offering parent training to families of moderate to high risk elementary school children. *Journal of Clinical Child and Adolescent Psychology* 2007;36:605–620. [PubMed: 18088218]
- Shonkoff, JP.; Meisels, SJ., editors. Handbook of early childhood intervention. Vol. 2nd. New York: Cambridge University Press; 2000.
- Silver RB, Measelle JR, Armstrong JM, Essex MJ. Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and the teacher-child relationship during the school transition. *Journal of School Psychology* 2005;43:39–60.
- Sinclair MF, Christenson SL, Evelo DL, Hurley CM. Dropout prevention for youth with disabilities: Efficacy of a sustained school engagement procedure. *Exceptional Children* 1998;65:7–21.
- Sparrow, SS.; Cicchetti, DV.; Balla, DV. Vineland Adaptive Behavior Scales. Vol. 2nd. Circle Pines, MN: American Guidance Service; 2005.
- Thorndike, RL.; Hagen, EP.; Sattler, JM. Stanford-Binet Intelligence Scale. Vol. 4th. Chicago: Riverside; 1986.

Figure 1.

Student-Teacher Relationship Scale Total Score by status group across child ages 6, 7, and 8 years. TD = typical development. ID = intellectual disability. Norm = normative sample mean of 117.

Table 1

Participant, Teacher, and Classroom Demographics at Child Age 6 Years

Demographic	Typical development (<i>n</i> = 61)		Intellectual disability (<i>n</i> = 37)		χ^2 or <i>t</i> ^a
	Mean/%	SD	Mean/%	SD	
Child					
Gender (% boys)	59.0		67.6		0.53
Race (% Caucasian, non-Hispanic)	65.6		48.6		2.08
Mean Stanford-Binet IQ	104.5	11.5	60.5	13.2	17.28***
Mean VABS ^b	104.5	16.5	61.0	10.4	16.00***
Parent					
Mean mother age in years	37.8	5.6	37.6	7.2	0.20
Mean father age in years	40.0	6.3	40.8	7.1	0.55
Mean mother grade in school	15.8	2.5	14.5	1.7	3.25**
Mean father grade in school	16.0	2.7	15.2	2.1	1.45
Mother marital status (% married)	88.5		73.0		2.88
Mother employment (% working)	67.2		48.6		2.58
Family income (% ≥ \$50,000)	75.4		51.4		4.94*
Teacher and classroom					
Child in special education (% greater than half of day)	0		40.5		46.14***
Mean no. students in class	19.1	4.9	14.1	5.7	4.41***
Mean no. teachers in class:	1.9	0.7	3.0	1.3	4.35***
Attends public school (%)	79.7		91.9		1.74

^a Chi squares in boldface.

^b Vineland Adaptive Behavior Scales.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2
Pearson Correlations of Primary Measures Across School Assessments by Group

Assessment/Group	Age 6		Age 7		Age 8		Correlations (rs)		
	Mean	SD	Mean	SD	Mean	SD	Age 6-7	Age 7-8	Age 6-8
<i>STRS^d</i>									
Total TD ^b	119.8	12.7	118.9	13.0	117.2	13.5	.48***	.56***	.46***
Total ID ^c	113.0	10.7	109.3	11.9	110.4	10.5	.28	.26	.24
TD vs. ID	$t = 2.72^{**}$		$t = 3.56^{**}$		$t = 2.64^{*}$		$z = 1.10$	$z = 1.70^{*}$	$z = 1.17$
<i>Conflict TD</i>									
Conflict TD	18.8	7.6	19.0	7.8	18.9	8.3	.66***	.66***	.52***
Conflict ID	20.9	6.5	22.4	7.0	22.6	7.5	.19	.26	.26
TD vs. ID	$t = 1.76$		$t = 2.15^{*}$		$t = 2.22^{*}$		$z = 2.67^{**}$	$z = 2.38^{*}$	$z = 1.44$
<i>Closeness TD</i>									
Closeness TD	45.2	5.3	44.8	5.9	43.1	6.1	.37***	.41***	.32*
Closeness ID	42.2	6.6	41.8	6.8	42.8	6.1	.36	.32	.38*
TD vs. ID	$t = 2.47^{*}$		$t = 2.32^{*}$		$t = 0.27$		ns	ns	ns
<i>TRF^d</i>									
TD	49.3	5.8	50.5	10.0	49.4	10.5	.63***	.70***	.60***
ID	59.8	5.8	62.3	7.7	60.6	6.6	.31	.49**	.14
TD vs. ID	$t = 5.56^{***}$		$t = 5.71^{***}$		$t = 5.15^{***}$		ns	ns	$z = 2.61^{**}$
<i>SSRS^e</i>									
TD	101.5	12.1	103.0	12.2	101.4	11.9	.56***	.61***	.63***
ID	88.6	11.1	88.1	12.3	90.1	12.2	.50**	.67***	.48***
TD vs. ID	$t = 5.53^{***}$		$t = 5.86^{***}$		$t = 4.58^{***}$		ns	ns	ns

^a Student-Teacher Relationship Scale.

^b Typical development.

^c Intellectual disability.

^d Teacher Report Form.

^e Social Skills Rating System.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Correlations of Independent Variables With Dependent Variables by Age

Age/Variable ^a	SSRS Total	STRS ^b Conflict	STRS Closeness
Age 6			
Child gender (1 = girl, 2 = boy)	-.07	.06	-.09
Child race (0 = other; 1 = Caucasian)	.05	.02	-.16
Mother education	.00	.07	.09
Status (TD, ID)	-.27**	.17	-.24*
Behavior problems (TRF Total)	-.71***	.75***	-.28**
Social Skills (SSRS Teacher)	.60***	-.51***	.40***
Age 7			
Child gender (1 = girl, 2 = boy)	-.36***	.25*	-.34**
Child race (0 = other; 1 = Caucasian)	.07	-.03	-.01
Mother education	-.02	.07	.00
Status (TD, ID)	-.35**	.22*	-.23*
Behavior problems (TRF Total)	-.66***	.65***	-.29**
Social skills (SSRS Teacher)	.62***	-.56***	.46***
Age 8			
Child gender (1 = girl, 2 = boy)	-.14	.04	-.28**
Child race (0 = other; 1 = Caucasian)	.08	-.04	.09
Mother education	.04	.02	.05
Status (TD, ID)	-.26**	.22*	-.03
Behavior problems (TRF Total)	-.75***	.75***	-.23*
Social skills (SSRS Teacher)	.69***	-.58***	.41***

^aTD = typical development, ID = intellectual disability, SSRS = Social Skills Rating System, TRF = Teacher Report Form.

^bStudent-Teacher Relationship Scale.

Table 4

Regressions on Student–Teacher Relationship Scale Subscales by Age and Standardized Beta

Model	Standardized beta		
	STRS ^a Total	STRS Conflict	STRS Closeness
Child age 6 final model			
Child gender (1 = female; 2 = male)	-.01	-.01	-.10
Child race (0 = non-Caucasian; 1 = Caucasian)	.03	.00	.12
Mother grade in school	-.03	-.04	-.01
Status (0 = typical development; 1 = intellectual disability)	.16 ^(*)	-.26 ^{**}	-.03
Child Behavior Problems (TRF ^b Total score)	-.63 ^{***}	.90 ^{***}	-.07
Child Social Skills (Teacher SSRS ^c Total)	.21 ^(*)	.03	.43 ^{**}
Model 1 (Demographics), $R^2 = .01$			
Model 2 (Demographics, Status), $R^2 = .07$			
Model 3 (Demographics, Status, Behavior Problems, Social Skills), $R^2 = .53$			
Child age 7 final model			
Child gender (1 = female; 2 = male)	-.22 ^{**}	.10	.27 ^{**}
Child race (0 = non-Caucasian; 1 = Caucasian)	.05	-.03	-.04
Mother grade in school	-.07	.12	-.05
Status (0 = typical development; 1 = intellectual disability)	.05	-.19 ^(*)	-.02
Child Behavior Problems (TRF Total score)	-.38 ^{**}	.56 ^{***}	.20
Child Social Skills (Teacher SSRS Total)	.35 ^{**}	-.24 ^(*)	.57 ^{***}
Model 1 (Demographics), $R^2 = .13$			
Model 2 (Demographics, Status), $R^2 = .22$			
Model 3 (Demographics, Status, Behavior Problems, Social Skills), $R^2 = .53$			
Child age 8 final model			
Child gender (1 = female; 2 = male)	-.06	-.06	-.31 ^{**}
Child race (0 = non-Caucasian; 1 = Caucasian)	.07	-.01	.16 ^(*)
Mother grade in school	-.04	.07	-.02
Status (0 = typical development; 1 = intellectual disability)	.15 ^(*)	-.16 ^(*)	.21 [*]
Child Behavior Problems (TRF Total score)	-.56 ^{***}	.74 ^{***}	.17
Child Social Skills (Teacher SSRS Total)	.36 ^{***}	-.15	.63 ^{***}
Model 1 (Demographics), $R^2 = .02$			
Model 2 (Demographics, Status), $R^2 = .10$			
Model 3 (Demographics, Status, Behavior Problems, Social Skills), $R^2 = .64$			

^a Student–Teacher Relationship Scale.^b Teacher Report Form.^c Social Skills Rating System.^(*) $p < .10$.^{*} $p < .05$.^{**} $p < .01$.^{***} $p < .001$.

Table 5

Regressions of Earlier Teacher Ratings on Age 8 Dependent Variables Behavior Problem (TRF Total Scores) and Social Skill Scores and Final Models

Predictor variable	Behavior problems age 8 St. Beta ^a	Social skills age 8 St. Beta
Age 6 score ^b	.24 [*]	.41 ^{***}
STRS ^c (age 6 and 7 combined)	-.42 ^{**}	.31 ^{**}
Status Group	.27 ^{**}	-.11
STRS × Status Group	.13	.01

Note. TRF: Teacher Report Form.

^a Standardized Beta.

^b Of dependent variable.

^c Student–Teacher Relationship Scale.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.

Behaviour Problems

Model 1 (TRF Total at Age 6), $R^2 = .36$

Model 2 (TRF at Age 6, STRS, Status), $R^2 = .46$

Model 3 (TRF at Age 6, STRS, Status, STRS by Status), $R^2 = .47$

Social Skills

Model 1 (Social Skills at Age 6), $R^2 = .41$

Model 2 (Social Skills at Age 6, STRS, Status), $R^2 = .49$

Model 3 (Social Skills at Age 6, STRS, STRS by Status), $R^2 = .49$

Table 6

Student–Teacher Relationship Scale (STRS) and IQ by Classroom Placement for the Intellectual Disability Group

Variable/Age	Special class (<i>n</i>)	Regular class (<i>n</i>) <i>t</i>
STRS		
Age 6	114.9 (22)	110.1 (14)1.28
Age 7	111.6 (23)	106.0 (11)1.30
Age 8	112.5 (26)	104.8 (10)2.01 ^(*)
IQ		
Age 6	56.2 (22)	67.5 (14)2.67 ^{**}
Age 7	56.0 (23)	65.8 (11)2.23 [*]
Age 8	56.6 (26)	72.2 (10)3.72 ^{***}

^(*)
 $p = .05$.

^{*}
 $p < .05$.

^{**}
 $p < .01$.

^{***}
 $p < .001$.