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The Sibling Relationship of Adolescents with and without Intellectual Disabilities

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Family members and the complex relationships among them play a critical role in the development of children with disabilities. However, family studies primarily focus on the parent-child relationship (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 2003; Stack, Serbin, Enns, Ruttler, & Barrieau, 2010). The limited research on the sibling relationship focuses more often on how the sibling with a disability affects his/her typically developing (TD) brother and/or sister (Ishizaki Y., Ishizaki T., Ozawa, Fukai, Hattori, Taniuchi, & Kobayashi, 2005; Eisenberg, Baker, & Blacher, 1998; McHale & Gamble, 1989; Orsmond & Seltzer, 2009; Petalas, Hastings, Nash, Lloyd, & Dowey, 2009; Wolf, Fisman, Ellison, & Freeman, 1998). There is much less known about how TD siblings contribute to the development of individuals with intellectual disability (ID). The purpose of this paper is twofold: 1) to examine differences in the sibling relationship for adolescents with and without intellectual disabilities and 2) to examine how the sibling relationship impacts the adjustment of adolescents with and without intellectual disabilities.

1.1 The Sibling Relationship

The sibling relationship has been conceptualized in the literature along four dimensions, including warmth, conflict, rivalry, and relative status/power (Furman & Buhrmester, 1985). Previous research has established that children with disabilities influence the endorsement of these factors (Doody, Hastings, O'Neil, & Grey, 2010; Schuntermann, 2007; Stoneman, 2001; Stoneman, 2005). With regard to warmth, Stoneman's (2001; 2005) review of the literature reported that the relationship between children with disabilities and their siblings is generally positive, if not more positive, than those between typically developing siblings.

Unlike warmth, no generalizations can be drawn regarding the level and intensity of conflict that siblings experience. Previous research has shown less conflict (Fisman, Wolf, Eillison, Freeman, & Szatmari, 1996), Floyd, Purcell, Rochardson, & Kupersmidt, 2009; Kaminsky & Dewey, 2001) or more conflict (Bagenholm & Gillberg, 1991; Ross & Cuskelly, 2006; Stoneman, Brody, Davis, & Crapps, 1989) in the sibling relationship when one child has a

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disability. With regard to rivalry, several studies have shown that siblings perceived their mothers to be more partial to the child with the disability (Bagenholm and Gillberg 1991; Bischoff & Tingstrom, 1991, Pi-ten-Cate & Loots, 2000; Cicirelli, 1994; McHale & Harris, 1992; McHale, Sloan, & Simeonsson, 1986; Sanders, 2004). Finally, when there is a child with a disability, parents often perceive greater status/power differential in the sibling relationship (Bischoff & Tingstrom, 1991; Floyd et al., 2009).

1.2 The Role of the Sibling Relationship in the Development of Typically Developing Children

Research with disabled-typical dyads suggests that the quality of the sibling relationship is related to the adjustment of typical developing children. Currently, there are inconsistent findings regarding how children with disabilities affect their typically developing siblings. There are some studies that report a negative sibling impact. For example, siblings of children with disabilities have been reported to have more externalizing behavior problems (Ishizaki et al., 2005; Petalas et al., 2009) internalizing behavior problems (Fisman et al., 1996; Ishizaki et al., 2005; Lobato, Kao, & Plante, 2005; Orsmond & Seltzer 2009; Sharpe & Rossiter, 2002), social problems (Bagenholm & Gillberg, 1991; Sharpe & Rossiter, 2002), and academic problems (Hannah & Midlarsky, 1985; Sanders, 2004) than siblings of children without disabilities.

However, not all studies have reported a negative sibling impact. Some studies have shown that siblings of children with disabilities are indistinguishable from their peers. For example, a meta-analysis by Rossiter and Sharpe (2001) found that the difference between siblings of children with intellectual disabilities and siblings of typically developing children in terms of psychological adjustment was small (effect size = $-.03$). Researchers have also reported on the positive impact of growing up with a brother or sister with a disability. Specifically, siblings of children with disabilities showed increased tolerance for differences, higher levels of empathy, more maturity, greater sense of responsibility, more self-confidence, and a greater appreciation of their own health and intelligence than siblings of children without disabilities (Cicirelli, 1994; Grossman, 1972; Powell & Ogle, 1985).

1.3 Criticisms of Previous Research and Contribution of the Present Study

There are two major limitations in the sibling disability literature. First, constellation variables (age, age spacing, gender, birth order, and whether the dyad is same sex or opposite sex) are not often accounted for when examining differences in the sibling relationship for children with and without intellectual disabilities. However, these factors may affect the quality of the sibling relationship. For example, the impact of a caretaking role on the sibling relationship is contingent on age. For typical siblings younger than the sibling with ID, greater caretaking responsibilities were associated with less conflict (Stoneman, Brody, Davis, & Crapps, 1991; Stoneman, 2001), whereas for older typical siblings, greater caretaking responsibilities were associated with more conflict (Stoneman, Brody, Davis, & Crapps, 1988) in the sibling relationship. In addition, sisters assume more caretaking responsibilities than brothers (Powell & Ogle, 1985; Stoneman, Brody, Davis, & Crapps, 1988).

The second major limitation is that a majority of sibling disability research focuses on how a child with a disability affects his/her typically developing siblings (Petalas et al., 2009; Mandlco, Olsen, Dyches, & Marshall, 2003; Rossiter & Sharpe, 2001; Pit-ten-Cate & Loots, 2000). However, given the increased behavior problems (Blacher & McIntyre, 2006; Eisenhower, Baker, & Blacher, 2005; McDermott, Coker, Krishnawwami, Nagle, Barnett-Queen, Wuori, 1996; McIntyre, Blacher, & Baker, 2006) and social deficits (Dallas, Stevenson, & McGurk, 1993b; Guralnick, Neville, Hammond, Connor, 2007; McIntyre et al., 2006) of children with disabilities, it is important to examine if and how the sibling relationship can contribute to the adjustment of children with ID. For them, the nature of the sibling relationship may be even more critical, given their limited social sphere (Guralnick et al., 2007; Kemp & Carter, 2002; Stoneman, Brody, Davis, Crapps, & Malone, 1991).

The purpose of the present study was to explore the sibling relationship of adolescents with and without intellectual disabilities with three research questions: 1) to what extent does disability status and constellation variables moderate the sibling relationship quality of warmth, conflict, rivalry, and status/power? 2) to what extent does warmth, conflict, rivalry, and status/power relate to behavior problems in adolescents with and without intellectual disabilities? 3) to what extent does warmth, conflict, rivalry, and status/power relate to social skills for adolescents with and without intellectual disabilities?

Method

2.1 Participants

Participants were from a larger longitudinal study that included samples from Pennsylvania and California. The goal of the larger study was to examine family, school, and child contributions to the emergence of behavior disorders in children with and without intellectual disabilities. For clarification purposes, “target” refers to the adolescents with intellectual disabilities or control adolescents without intellectual disabilities. “Sibling” refers to the brother or sister closest in age to the target adolescent.

In the larger longitudinal study, targets in the typically developing (TD) group were recruited at age 3 from preschools and day care programs. Targets in the intellectual disability (ID) group were recruited at age 3 through community agencies that provided services for people with developmental disabilities. Targets in the ID group who could not walk, had autism, or IQ below 40 were excluded at initial entry. In the control group of TD children, targets were excluded if they had any type of disability or were born pre-maturely. Measures of interest were collected from children at each year between the ages of 3 and 13.

When the targets were 9 years old, they were administered a short form of the Weschler Intelligence Scale for Children-IV (WISC-IV, Wechsler, 2003). Parents were administered the Vineland Adaptive Behavior Scales (VABS, Sparrow, Balla, & Cicchetti, 2005). Adolescents categorized as ID had WISC-IV and VABS scores of 84 or lower. Adolescents categorized as TD had WISC-IV scores of 85 or higher. Thus, children whose WISC-IV and VABS scores fell in the borderline ID range (APA, 2000) were also included in this study. Three targets with ID were excluded from the present study because their WISC-IV and VABS scores did not meet the aforementioned criteria (e.g., WISC-IV=80 and VABS= 90).

If WISC-IV and/or VABS scores were missing at age 9, disability status was determined with age 5 criteria: 1) a score of 40 to 84 on the Stanford-Binet Intelligence Scale-Fourth Edition (Stanford-Binet, Thorndike, Hagen, & Sattler, 1986) and 2) a score of 40 to 84 on the VABS. Eight targets with ID were classified using the age 5 criteria.

The present study consisted of a subsample of 70 sibling dyads. Each dyad was comprised of one 12-year old adolescent with (N=23) or without ID (N= 47). In the combined sample (TD and ID targets), 42.9% of the targets were boys. Of the mothers, 11.4% were African American, 4.3% were Asian, 61.4% were Caucasian, 18.6% were Hispanic, 1.4% were Native American, and 1.4% were classified as “other.” Over half of the families (57.1%) had an annual income greater than \$50,000. Siblings were 11.85 years old on average (standard deviation was 4.54) and ranged in age from about 2 to 23 years old. In 45.7% of the cases, the sibling was older than the target. Slightly less than half of the siblings (46.2%) were boys. The age spacing between the adolescent and the sibling was 3.69 years on average (standard deviation was 2.61) and ranged from 0 to 11 years.

Table 1 shows the demographic characteristics by disability status (ID, TD). With regard to adolescents’ demographics, no statistically significant differences were found between the two groups on adolescents’ gender (chi-square (1) = .04, $p > .05$; TD= 42.6% boys, ID= 42.5% boys), race (chi-square (1) = .73, $p > .05$; TD= 57.2% Caucasian, ID= 47.8% Caucasian), or health (chi-square (1) = 3.09, $p > .05$; TD= 86.1% excellent health, ID= 47.8% excellent health). With regard to sibling demographics, no statistically significant difference was found between the two groups on siblings’ age ($t(63) = 1.83$, $p > .05$; TD= 12.55 (SD=4.60), ID= 10.39 (SD=4.26), gender (chi-square (1)= 1.51, $p > .05$; TD= 38.3% boys, ID= 52.2% boys), or birth order (chi-square (1) = 3.26, $p > .05$; TD= 52.2% sibling is older, ID= 30.4% sibling is older). Therefore, no adolescent or sibling characteristics were covaried in subsequent analyses. With regard to mother demographics, no statistically significant difference was found between the two groups on mother’s marital status (chi-square (1)= .38, $p > .05$; TD= 78.7% married, ID= 73.9% married). A statistically significant difference was found between the two groups on mothers’ work (chi-square (1)= 4.04, $p < .05$; TD= 74.5% worked outside the home, ID= 52.2% worked outside the home) and education (chi-square (1)= 8.38, $p < .01$; TD= 74.5% college degree or higher, ID= 52.2% college degree or higher). However, mothers’ work was not significantly related to total behavior problems, ($r = .07$, $p > .05$), internalizing behavior problems, ($r = .03$, $p > .05$), externalizing behavior problems, ($r = -.02$, $p > .05$), or social skills, ($r = .02$, $p > .05$). Furthermore, mothers’ education was not significantly related to total behavior problems, ($r = .15$, $p > .05$), internalizing behavior problems, ($r = .21$, $p > .05$), externalizing behavior problems, ($r = .06$, $p > .05$), or social skills, ($r = -.06$, $p > .05$). Therefore, no mother characteristics were covaried in subsequent analyses.

2.2 Procedures

All procedures were approved by the Institutional Review Board. When the targets were 12 years old, family demographics were obtained during an in-home interview with the mother. Measures of sibling relationship quality, behavior problems, and social skills were obtained

as part of a questionnaire battery completed by the mother. Only disability status (TD or ID) was obtained when the targets were 9 years old.

2.3 Measures

2.3.1 Weschler Intelligence Scale for Children-Fourth Edition (WISC-IV)—

Adolescents' disability status was assessed with the WISC-IV (Wechsler, 2003), a widely used instrument of cognitive ability. The WISC-IV is comprised of ten core subtests and five supplemental subtests. The present study used a short form of the WISC-IV, which included three subtests: matrix reasoning, vocabulary, and arithmetic. The three subtests chosen for the present study have high validity and reliability coefficients ($r_{ss} = .95$ and $r = .91$) (Sattler & Dumont, 2004). The full scale IQ (FSIQ), with a mean = 100 and SD = 15, was used as a measure of general intelligence.

2.3.2 Vineland Adaptive Behavior Scales (VABS)—

Adolescents' adaptive behavior was assessed with the VABS (Sparrow, Balla, & Cicchetti, 2005) in the ID group only. The VABS is a semi-structured interview that assesses the day-to-day activities that are necessary for children to take care of themselves. Mothers were used as informants in the present study. Three subscales (communication, daily living skills, and socialization) were combined to form an Adaptive Behavior Composite, with a mean = 100 and SD = 15. In the ID subsample, the mean was 72.19 with a standard deviation of 6.97. Cronbach's alpha for the current sample was .90.

2.3.3 Sibling Relationship Questionnaire (SRQ)—

Mothers completed the SRQ (Furman and Burmester, 1985), a 48-item measure about the quality of the targets' sibling relationship. Each item was rated on a 5-point Likert scale from 1 (hardly at all) to 5 (extremely much). The items represented 15 dimensions of sibling interaction (e.g., intimacy, competition, nurturance, etc). These dimensions generated four subscales: warmth, conflict, rivalry, and status/power. Cronbach's alpha for the current sample was .85.

2.3.4 Social Skills Rating System-Secondary Level (SSRS)—

Mothers completed the parent form of the SSRS (grades 7–12) (Gresham & Elliot, 1990), a 52-item measure about social skills and problem behaviors. Scores on social skills and problem behaviors were converted to standard scores with a mean = 100 and an SD = 15. Each item was rated from 0 (never) to 2 (very often) for "how often" they occur. Each item was also rated from 0 (not important) to 2 (critical) for "how important" the social skill is. The social skills domain includes sub-domains measuring: cooperation, assertion, self-control, and responsibility. The total score for social skills was used in the present study. Cronbach's alpha for the current sample was .87.

2.3.5 Achenbach Child Behavior Checklist (CBCL)—

Mothers completed the parent form of the CBCL (Achenbach & Rescorla, 2001), a 113-item questionnaire used to identify patterns of behavior problems. Each item was rated on a 3-point scale from 0 (not true) to 2 (very true or often true) of the child. The CBCL parent form divides behavioral concerns into 8 categories. The categories of Withdrawn, Somatic Complaints and Anxious/Depressed are summed to form a measure of internalizing behavior problems. The categories of Social

Problems, Attention Problems, Thought Problems, Delinquent Behavior and Aggressive Behavior are summed to form a measure of externalizing behavior problems. A total score that sums all 8 categories is provided as an index of behavior problems. The sums score for total behavior problems, internalizing behavior problems, and externalizing behavior problems was used for the present study. A score of 60 or higher suggests behavior problems in the clinical range. In the ID sub-sample, 17.4% of the mothers reported that their adolescents displayed behavior problems in the clinical range. In the TD subsample, 4.2% of the mothers reported that their adolescents displayed problems in the clinical range. Cronbach's alpha for the current sample was .85.

Results

The distributions of the variables of interest (sibling relationship quality, behavior problems, and social skills) were examined for outliers. Data points that were more than three standard deviations above or below the mean were considered outliers. Four outliers were present (one outlier in the SRQ and three outliers in the CBCL) and these outliers were drawn from two participants. As suggested by Cohen J., Cohen P., West, and Aiken (2002), the outliers were set equal to three standard deviations from the mean in order to reduce the influence of extreme data points. Analyses included univariate analysis of variance and multiple regression.

3.1 Research Question 1: To what extent do disability status and constellation variables (birth order, target adolescents' gender, siblings' gender, or type of dyad) moderate the sibling relationship quality of warmth, conflict, rivalry, or status/power

To examine if disability status interacted with constellation variables to effect warmth, three 2×2 fixed effects analyses of variance were conducted. Table 2 shows that no significant interaction was found between disability status and birth order ($F(1,58) = .09, p > .10$) or between disability status and sibling gender ($F(1,61) = .53, p > .10$). However, a trend was found between disability status and target adolescents' gender $F(1, 65) = 3.72, p < .10$. Specifically, target adolescents' gender did not matter for TD adolescents (.03 vs .04). However, for ID adolescents, mothers reported more warmth for boys (.42) than girls (-.54). The interaction explained 5% of the variance in warmth. A significant interaction was also found between disability status and type of dyad $F(1,61) = 5.68, p < .05$. Specifically, for TD adolescents, mothers reported more warmth for opposite sex dyads (.27) than same sex dyads (-.35). However, for ID adolescents, mothers reported more warmth for same sex dyads (.21) than opposite sex dyads (-.44). The interaction explained 9% of the variance in warmth (See Figure 1).

To examine if disability status interacted with constellation variables to affect conflict, three 2×2 fixed effects analyses of variance were conducted. Table 2 shows that no significant interaction was found between disability status and birth order $F(1,58) = .49, p > .10$, between disability status and target adolescents' gender ($F(1,65) = .00, p > .10$), between disability status and siblings' gender ($F(1,61) = .19, p > .10$), or between disability status and type of dyad $F(1,61) = .00, p > .10$.

To examine if disability status interacted with constellation variables to affect rivalry, three 2×2 fixed effects analyses of variance were conducted. Table 2 shows that no significant interaction was found between disability status and birth order $F(1,58) = 1.35, p > .10$), between disability status and target adolescents' gender ($F(1,65) = .44, p > .10$), between disability status and siblings' gender ($F(1,61) = .44, p > .10$), or between disability status and type of dyad $F(1,61) = .14, p > .10$).

To examine if disability status interacted with constellation variables to affect status/power, three 2×2 fixed effects analyses of variance were conducted. Table 2 shows that a significant interaction was found between disability status and birth order $F(1,58) = 6.09, p < .05$). Specifically, for TD adolescents, mothers reported more status/power differences when the sibling was younger (.72) than when the sibling was older (−.43). For ID adolescents, birth order did not matter for status/power (−.30 vs. −.34) (See Figure 2). The interaction explained 10% of the variance in status/power. No significant interaction was found between disability status and target adolescents' gender ($F(1,65) = .77, p > .10$), between disability status and siblings' gender ($F(1,61) = .31, p > .10$), or between disability status and type of dyad $F(1,61) = 1.50, p > .10$ (See Figure 2).

3.2 Research Question 2: To what extent do warmth, conflict, rivalry, and status/power relate to behavior problems for adolescents with and without intellectual disabilities?

To examine if aspects of the sibling relationship related to the total behavior problems of target adolescents, a multiple regression analysis was conducted. As shown in Table 3, for the TD adolescents, 23% of the variance in total behavior problems was predicted by warmth, conflict, rivalry, and status/power. Collectively these variables predicted a significant proportion of variation in total behavior problems ($F(4,41) = 3.13, p < .05$). Conflict was a statistically significant predictor of total behavior problems, after controlling for warmth, rivalry, and status/power ($\beta = .34, t = 2.42, p < .05$). There was also a trend for rivalry ($\beta = .28, t = 1.98, p < .10$).

For the ID group, 23% of the variance in total behavior problems was predicted by the warmth, conflict, rivalry, and status/power. Collectively, these variables did not predict a significant proportion of variation in total behavior problems ($F(4,18) = 1.36, p > .10$). However, there was a trend for conflict to be a predictor of total behavior problems, after controlling for warmth, rivalry, and status/power ($\beta = .46, t = 1.98, p < .10$).

To examine if aspects of the sibling relationship related to the internalizing behavior problems of target adolescents, a multiple regression analysis was conducted. As shown in Table 3, for the TD adolescents, 22% of the variance in internalizing behavior problems was predicted by warmth, conflict, rivalry, and status/power. Collectively these variables predicted a significant proportion of variation in internalizing behavior problems ($F(4,41) = 2.81, p < .05$). Conflict was a statistically significant predictor of internalizing behavior problems, after controlling for warmth, rivalry, and status/power ($\beta = .33, t = 2.30, p < .05$). There was also a trend for rivalry ($\beta = .27, t = 1.75, p < .10$). For the ID group, 9% of the variance in internalizing behavior problems was predicted by warmth, conflict, rivalry, and status/power. Collectively, these variables did not predict a significant proportion of

variation in internalizing behavior problems ($F(4,18) = .42, p > .10$). Individually, none of the variables were significant predictors or trends for internalizing behavior problems.

To examine if aspects of the sibling relationship related to the externalizing behavior problems of target adolescents, a multiple regression analysis was conducted. As shown in Table 3, for the TD adolescents, 18% of the variance in externalizing behavior problems was predicted by warmth, conflict, rivalry, and status/power. Collectively there was a trend for these variables to predict a significant proportion of variation in externalizing behavior problems ($F(4,41) = 2.18, p < .10$). There was also a trend for conflict to be a predictor of externalizing behavior problems, after controlling for warmth, rivalry, and status/power ($\beta = .26, t = 1.77, p < .10$). For the ID group, 42% of the variance in externalizing behavior problems was predicted by warmth, conflict, rivalry, and status/power. Collectively, these variables predicted a significant proportion of variation in externalizing behavior problems ($F(4,18) = 3.24, p < .05$). Conflict was a statistically significant predictor of externalizing behavior problems, after controlling for warmth, rivalry, and status/power ($\beta = .52, t = 2.54, p < .05$). There was a trend for status/power ($\beta = -.39, t = -1.88, p < .10$).

3.3 Research Question 3: To what extent do warmth, conflict, rivalry, and status/power relate to social skills for adolescents with and without intellectual disabilities?

To examine if aspects of the sibling relationship related to the social skills of target adolescents, a multiple regression analysis was conducted. As shown in Table 4, for the TD adolescents, 10% of the variance in social skills was predicted by warmth, conflict, rivalry, and status/power. Collectively, these variables did not predict a significant proportion of variation in social skills ($F(4,40) = 1.07, p > .10$). For the ID group, 6% of the variance in social skills was predicted by warmth, conflict, rivalry, and status/power. Collectively, these variables did not predict a significant proportion of variation in social skills ($F(4,16) = .24, p > .10$). Individually, none of the variables were significant predictors or trends for either group.

Discussion

The purpose of the present study was to explore the sibling relationship for adolescents with and without intellectual disabilities using constructs from the existing literature that had been widely examined. This study aimed to better control for child characteristics that confounded some previous research. The first question asked if there were group differences in warmth, conflict, rivalry, or status/power for adolescents with and without intellectual disabilities based on birth order, gender of the adolescent and gender of the sibling, as well as whether the dyad was same-sex or opposite sex. We found that for TD adolescents, mothers reported more warmth in the sibling relationship for opposite sex dyads. However, for adolescents with ID, mothers reported more warmth in the sibling relationship for same-sex dyads. This finding is consistent with the sex commonality principle (Akiyama, Elliot, & Antonucci, 1996) shown in sibling relationships of children with Down Syndrome. Specifically, same sex-dyads reported more positive sibling interactions than opposite sex dyads (Cuskelly & Gunn, 2003). One explanation for this is that siblings of children with ID often become involved in types of caretaking activities (Bischoff & Tingstrom, 1991; Pi-ten-

Cate & Loots, 2000; Cuskelly & Gunn, 2003; McHale & Gamble, 1989; Stoneman, Brody, Davis, & Crapps, 1988; Stoneman, Brody, Davis, & Crapps, 1991) that could become awkward with opposite sex dyads.

Additionally, with regard to this first research question, we also found that for TD adolescents, mothers reported more status/power differences when the sibling was younger than when the sibling was older. It is likely that having a younger sibling is related to more status/power differences because of the increased conflict that occurs over tangible goods (e.g., toys) and chores in TD-TD dyads (Felson, 1983). For adolescents with ID, birth order did not affect status/power in the sibling relationship. This is inconsistent with Bischoff & Tingstrom's (1991) study, which reported more status/power differences between children with disabilities and their younger sibling. In the present study, it is likely that birth order did not affect status/power in the ID group due to the small sample size, and to the restricted range of the target child age.

The second research question asked how warmth, conflict, rivalry, and status/power related to behavior problems of adolescents with and without intellectual disabilities. We found that conflict was related to total behavior problems for adolescents with and without intellectual disabilities. Specifically, for TD adolescents, conflict was related to internalizing behavior problems. This is consistent with previous research on TD-TD dyads. For example, Kim, McHale, Crouter, and Osgood (2007) reported that sibling conflict was linked to increases in depressive symptoms. However, for adolescents with ID, conflict was related to externalizing behavior problems. One probable explanation for this finding is that given their limited social sphere (Guralnick et al., 2007; Kemp & Carter, 2002), adolescents with ID model behaviors learned in the sibling relationship. In particular, sibling conflict may teach a more coercive style of interaction (Bank, Patterson, & Reid, 1996), which are expressed as externalizing behavior problems for adolescents with ID. However, for TD adolescents, conflicts at home may be a way of "working out" differences in a safe environment (e.g., home) that are not expressed elsewhere (e.g., school).

The third question asked how warmth, conflict, rivalry, and status/power related to social skills of adolescents with and without intellectual disabilities. In the present study, aspects of the sibling relationship did not relate to social skills for either group. This is surprising considering that Floyd et al. (2009) reported that warmth and conflict in the sibling relationship predicted greater social competence for individuals with ID. However, Floyd and colleagues used both observations and teacher reports to assess social competence, whereas the present study only used mother reports to assess social skills, and mothers were reporting on a home, as opposed to a school, context. Perhaps a more comprehensive assessment of social skills, or the addition of teacher reports of social skills, may have revealed an association between sibling relationships and social skills.

4.1 Implications

As mentioned earlier, the majority of sibling disability research focused on how a child with a disability affected his/her TD siblings (Petalas et al., 2009; Mandelco, Olsen, Dyches, & Marshall, 2003; Rossiter & Sharpe, 2001; Pit-ten-Cate & Loots, 2000). The present study contributes to the literature in an exploratory way by investigating the impact TD siblings

have on the development of adolescents with ID. There are two possible theoretical mechanisms by which TD siblings can affect the development of ID individuals. First is social learning theory, which posits that individuals will model the behaviors of others (Bandura, 1977). Research with typical sibling dyads has shown that younger siblings were at a higher risk for behavior problems when they were exposed to sibling conflict as well as the deviant activities of an older sibling (Synder, Bank, & Burraston, 2005). Since children with ID assume the role of younger child regardless of age or birth order (Dallas et. al, 1993a), it is likely that they model externalizing and other behaviors from observing their TD sibling. Second is attribution theory, which posits that individuals will develop a positive or negative attribution bias, based in part on their previous experiences, that will influence their behavior toward others (Gilbert, 1994). Research with typical sibling dyads has shown that sibling conflict led to a negative attribution bias, which in turn resulted in more negative peer interactions (Lockwood, Kitzmann, & Cohen, 2001). Although we have no evidence of this, perhaps future direct sibling interviews, as well as parent interviews, will lend credence to this theory of attribution on the part of individuals with ID.

4.2 Limitations and Future Directions

There are limitations in the present study. The first limitation was the small sample size.. However, even given the small sample size, this study explored detailed aspects of the sibling relationship in ID-TD dyads. The second limitation was that all of the data were based on mother reports. There were no direct reports from the siblings or target adolescents on their sibling relationship. However, in many of the articles reviewed for the present study, previous researchers have collected questionnaire data from mothers even when they had questionnaire data from the siblings (Bischoff & Tingstrom, 1991; Kaminsky & Dewey, 2001; Ross & Cuskelly, 2006; Wolf et al, 1998). It is likely that siblings, especially younger siblings, are not reliable reporters, and therefore, obtaining questionnaire data from mothers is a viable option.

Future studies might examine sibling relationships and the adjustment of adolescents with ID longitudinally. It is likely that adolescents with behavior problems create more sibling conflict. Longitudinal analyses would provide a better understanding of the direction of effect. Nonetheless, this initial exploration of how typically developing siblings impact their brothers or sisters with ID sets the stage for subsequent research directions, including further understanding of the sibling context and the developmental trajectory of the sibling relationship.

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Research Highlights

1. Adolescent sibling relationships were examined.
2. More warmth in the sibling relationship for same-sex dyads.
3. Status/power in the sibling relationship not affected by birth order.
4. Conflict related to externalizing behavior problems.

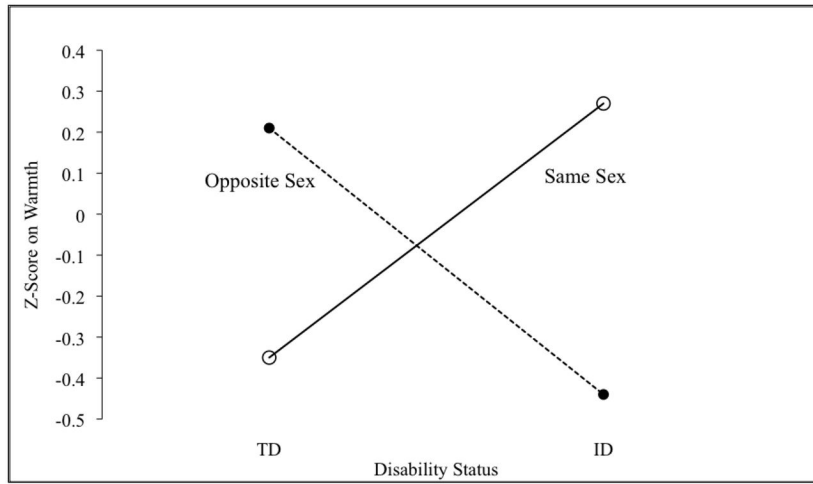


Figure 1. Interaction effect between disability status and type of dyad in warmth.

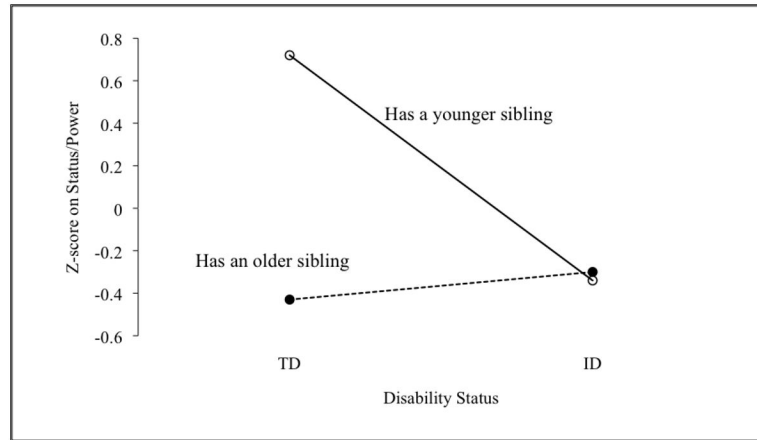


Figure 2. Interaction effect between disability status and birth order in status/power.

Table 1

Demographics by Disability Status

Variable	TD (N=47)	ID (N=23)	χ^2 or t
Adolescents (12 years old)			
Gender (% boys)	42.6	42.5	$\chi^2 = .04$
Race (% Caucasian)	57.4	47.8	$\chi^2 = .73$
Health (% in excellent health)	68.1	47.8	$\chi^2 = 3.09$
Siblings			
Age (mean age in years)	12.55(4.60)	10.39(4.26)	t= 1.83
Gender (% boys)	38.3	52.2	$\chi^2 = 1.51$
Birth Order (% of siblings older than target)	53.2	30.4	$\chi^2 = 3.26$
Mothers			
Marital Status (% married)	78.7	73.9	$\chi^2 = .38$
Work (% working outside the home)	74.5	52.2	$\chi^2 = 4.04^*$
Education (% with college degree or higher)	61.7	26.1	$\chi^2 = 8.28^{**}$

Note. TD = Typically Developing. ID = Intellectual Disability.

*
p<.05,

**
p<.01

Table 2

Group Differences in Sibling Relationship Quality

	Warmth		Conflict		Rivalry		Status/Power	
	F	η^2	F	η^2	F	η^2	F	η^2
Disability status * Birth order	.09	0	.49	.01	1.35	.02	6.09*	.10
Disability status * Targets' gender	3.72 [†]	.05	0	0	.44	.01	.77	.01
Disability status * Siblings' gender	.53	.01	.10	0	.44	.01	.31	.01
Disability status * Type of dyad	5.68*	.09	0	0	.14	.03	1.5	.02

[†]p<.10,

* p<.05

Table 3

Multiple Regression Model Predicting Behavior Problems

Variable	TD (N=47)			ID (N=23)		
	B	SEB	β	B	SEB	β
Total BP						
Warmth	.14	.13	.17	.01	.26	.01
Conflict	.30	.13	.34*	.41	.21	.46 [†]
Rivalry	.28	.15	.28 [†]	-.03	.2	-.03
Status/Power	.13	.12	.15	-.19	.24	-.19
R^2	.23			.23		
Internalizing BP						
Warmth	.13	.14	.14	.12	.32	0.1
Conflict	.30	.13	.33*	.27	.26	.26
Rivalry	.28	.16	.27 [†]	.13	.25	.14
Status/Power	.12	.13	.14	.13	.30	.11
R^2	.22			.09		
Externalizing BP						
Warmth	.05	.15	.06	-.17	.22	-.17
Conflict	.26	.15	.26 [†]	.45	.18	.52*
Rivalry	.28	.18	.25	-.11	.17	-.14
Status/Power	.17	.14	.17	-.38	.20	-.39 [†]
R^2	.18			.42		

Note: TD = Typically Developing, ID = Intellectual Disability, BP = Behavior Problems

[†] p<.10,

* p<.05

Table 4

Multiple Regression Model Predicting Social Skills

Variable	TD (N=47)			ID (N=23)		
	B	SEB	β	B	SEB	β
Warmth	.09	.15	.10	.17	.34	.15
Conflict	.02	.14	.03	-.10	.31	-.09
Rivalry	-.23	.18	-.22	-.06	.27	-.07
Status/Power	-.12	.14	-.14	-.02	.37	-.02
R^2	.10			.06		

Note: TD = Typically Developing. ID = Intellectual Disability.

‡ p<.10,

* p<.05,

** p<.01,

*** p<.001