

Friendships of Children and Adolescents With Spina Bifida: Social Adjustment, Social Performance, and Social Skills

Katie A. Devine,¹ PhD, Grayson N. Holmbeck,² PhD, Laurie Gayes,² BA, and Jason Q. Purnell,³ PhD, MPH

¹University of Rochester Medical Center, ²Loyola University Chicago, and ³Washington University in St. Louis

All correspondence concerning this article should be addressed to Grayson N. Holmbeck, PhD, Department of Psychology, Loyola University Chicago, 1032 W. Sheridan Rd., Chicago, IL, 60660, USA. E-mail: gholmbe@luc.edu

Received November 15, 2011; revisions received and accepted August 19, 2011

Objective To characterize dyadic and general friendships of youth with spina bifida (SB).

Methods Families of youth with SB recruited a peer to participate; 106 dyads participated. Youth with SB and peers completed questionnaires and interviews regarding characteristics of the dyadic friendship and each individual's general friendships. **Results** Youth with SB and their peers were similar in many ways. However, youth with SB rated the friendship as closer and were more likely to see peers as best friends rather than the reverse. Regarding general friendships, youth with SB spent fewer days with friends, reported lower levels of companionship, security, and closeness in their friendships, and reported lower levels of emotional support from peers and family. **Conclusions** Youth with SB experience significant differences in the quality and reciprocation of friendships. Targeted interventions may assist youth in developing high quality friendships.

Key words adolescents; friendship; peers; spina bifida.

Introduction

Past research suggests that friendships have positive effects on cognitive, social-cognitive, linguistic, sexual, and moral development (Cicchetti & Bukowski, 1995). Relative to family members, peers may provide distinct forms of companionship and emotional support (LaGreca, 1992). Unfortunately, children with chronic illnesses and physical disabilities, particularly those whose conditions involve the central nervous system, are at risk for social difficulties and lower levels of peer contact (Meijer, Sinnema, Bijstra, Mellenbergh, & Wolters, 2000; Reiter-Purtill, Waller, & Noll, 2009). Compared with typically developing youth and those with other chronic conditions such as diabetes, youth with spina bifida (SB) tend to be socially immature and passive, have fewer friends, and are less likely to have social contacts outside of school (e.g., Blum, Resnick, Nelson, & St. Germaine, 1991; Ellerton, Stewart, Ritchie, & Hirth, 1996). Although children and adolescents with SB are at risk for having fewer friendships, the

characteristics and quality of those friendships are poorly understood. In the current study, we examined the quality of specific friendships between youth with SB and a chosen peer, in addition to general characteristics of friendships experienced by youth with SB.

SB is one of the most common birth defects, occurring in roughly 18 out of every 100,000 live births in the United States (Centers for Disease Control and Prevention, 2008). SB arises in the first month of pregnancy, during which the spinal column fails to develop fully, resulting in exposure of a portion of the spinal cord. Associated physical problems may include motor paralysis, sensory loss, urinary problems, orthopedic problems, and neurological difficulties (Fletcher & Brei, 2010). Myelomeningocele (MM), a common type of SB, is often associated with brain abnormalities, hydrocephalus, and cognitive impairments (Fletcher & Brei, 2010). Hydrocephalus and shunt placement to treat hydrocephalus may be associated with a greater degree of cognitive impairment, including problems

in the areas of planning, orienting and shifting attention, and working memory (Brown et al., 2008; Rose & Holmbeck, 2007). These cognitive and executive function deficits are hypothesized to mediate the relation between SB status and social adjustment (Rose & Holmbeck, 2007).

Much of the research on youth with SB has focused on physical and cognitive issues, and relatively little work has been done to examine peer relationships in youth with SB, focusing mostly on broad measures of social competence (Holmbeck & Devine, 2010). In previous studies, children and adolescents with SB were less likely to have social contacts outside of school (Blum et al., 1991; Ellerton et al., 1996; Holmbeck et al. 2003), had smaller social networks (Cunningham, Thomas, & Warschausky, 2007; Ellerton et al., 1996) and tended to withdraw from social contacts (Holmbeck et al., 2003; Shaw, 2001). A small observational study showed that children and adolescents with SB had fewer interactions with peers and were less likely to have a peer initiate contact with them (Tin & Teasdale, 1985). Adolescents with SB showed lower levels of social adjustment but similar levels of observed social skills in a role-play task compared with typically developing youth (Ammerman, Van Hasselt, Hersen, & Moore, 1989). Social difficulties appear to persist during adolescence (Holmbeck et al., 2010).

Although investigators have begun to describe various aspects of social functioning of youth with SB, these studies have lacked an organizing framework relating the various components to overall social competence. Cavell (1990) proposed a tri-component model of social competence that integrates three core aspects: social adjustment, social performance, and social skills. According to Cavell (1990), social adjustment is the degree to which an individual is achieving developmentally appropriate goals, and may be measured by perceived social competence (e.g., self-report of social competence), peer acceptance (e.g., number of friends, peer ratings), and quality of friendships (e.g., level of companionship, degree of social support). Social performance is defined as an individual's response to social situations, which can be evaluated based upon specific criteria relevant to the situation (Cavell, 1990). One crude measure of social performance is the frequency of social interactions, such as how many days one spends with friends (Cavell, 1990). Finally, social skills are defined as abilities needed to perform competently in a social situation, including encoding skills (e.g., perception and interpretation of a situation), decision skills (e.g., social self-efficacy), and enactment skills (e.g., asking a friend to get together, planning activities with friends; Cavell, 1990).

Cavell's model of social competence has generally been applied to a child's functioning at the group level, but children who are at risk for poor group social acceptance may still experience close dyadic relationships (Parker & Asher, 1993). Children who have difficulty being accepted by peers may experience emotional well-being if they have strong dyadic friendships (Bukowski & Hoza, 1989; Furman & Robbins, 1985). However, dyadic relationships are understudied in comparison to group acceptance (Parker & Asher, 1993), and even less is known about friendships in children with chronic illnesses.

This study aimed to expand the literature on youth with SB by using Cavell's (1990) model to evaluate the three aspects of social competence within a dyadic relationship as well as in general friendships (Figure 1). Specifically, we aimed to compare youth with SB and their chosen peers on the reciprocity of the friendship (i.e., whether each considered the other to be his/her best friend) and on measures of social adjustment, social performance, and social skill. We hypothesized that chosen peers would be less likely to reciprocate the closeness of the relationship and that youth with SB would report lower levels of functioning across all measures of social adjustment, performance, and skill compared to selected friends. Further, since age and gender effects on children's friendships have been observed in the developmental literature (e.g., Berndt, 1982), we examined these influences in our sample.

Methods

Participants

Participants were recruited for an ongoing longitudinal study examining neurocognitive, family, and social development in children with SB. This study focused exclusively on the subset of data related to social development, specifically friendships in youth with SB at Time 1. Families of children with SB were recruited from four hospitals and a statewide SB association in the Midwest. Inclusion criteria for youth with SB ("target" children) were: (a) diagnosis of SB (types included MM, lipomeningocele, myelocystocele); (b) age 8–15 years at Time 1; (c) ability to speak and read English or Spanish; (d) involvement of at least one primary custodial caregiver; and (e) residence within 300 miles of laboratory (to allow for home visits to collect data). 246 families were approached; 163 families agreed to participate, but 21 of those families were unable to be contacted or later declined, and two families did not meet inclusion criteria, resulting in a sample size of 140 families (57% participation rate).

Social Adjustment	Social Performance	Social Skill
Dyadic Friendship	Dyadic Friendship	Dyadic Friendship
<i>Peer Acceptance</i>	• Frequency of spending time together	• Who suggests getting together
• Closeness • Reciprocity		
General Friendships	General Friendships	General Friendships
<i>Peer Acceptance</i>	• Days spent with friends	• Asking friends to get together
• Number of Friends • % "Online" Friends • Frequency of being teased		• Choosing activities with friends
<i>Quality of Friendships</i>		• Social Self-Efficacy
• Friendship Qualities • Social Support		• Frequency of teasing others
<i>Perceived Competence</i>		
• Ease of Making Friends		

Figure 1. Interpretation of Cavell's (1990) model to describe social competence in dyadic and general friendships.

There were no differences in SB characteristics between those who participated and those who did not: type of SB (i.e., MM vs. other), $\chi^2(1) = 0.0002$, *ns*, shunt status, $\chi^2(1) = 0.003$, *ns*, and occurrence of shunt infections, $\chi^2(1) = 1.08$, *ns*.

Each family was asked to invite a peer to participate. Inclusion criteria for peers were (a) age 6–17 years (target child's age range ± 2 years) at Time 1, and (b) ability to speak and read English or Spanish. Peers were not excluded based on health status. Additionally, families were asked to recruit peers who were not related to the child and preferably within 2 years of the target child's age, though peers not meeting these criteria were not excluded from the larger study. One hundred twenty-one families (86%) identified a peer within the inclusionary age range (two peers were excluded due to being older than 17 years). Given our interest in friendships outside of family relationships, only peers who were not related to the child with SB were included in these analyses. One hundred six (88% of all peers recruited) were unrelated to the participating child with SB; therefore 106 youth with SB (76% of our sample) and their chosen peers were included in the analyses. All youth with SB and peers were English-speaking.

Children and adolescents with SB ranged from 8 to 15 years of age ($M = 11.19$ years, $SD = 2.40$), and 55.7% were female. Peers ranged in age from 6 to 17 years ($M = 10.98$ years, $SD = 2.75$), and 55.7% were female

Table 1. Child and Peer Demographics

Age (years)	Child with SB <i>n</i> = 106	Peer <i>n</i> = 106
6–7	–	9 (8.5%)
8–9	33 (31.1%)	33 (31.1%)
10–11	22 (20.8%)	17 (16.0%)
12–13	28 (26.4%)	21 (19.8%)
14–15	23 (21.7%)	22 (20.8%)
16–17	–	3 (2.8%)
Missing	–	1 (0.9%)
Sex		
Male	47 (44.3%)	47 (44.3%)
Female	59 (55.7%)	59 (55.7%)
Race		
Caucasian	64 (60.4%)	68 (64.2%)
Hispanic	24 (22.6%)	19 (17.9%)
African American	13 (12.3%)	9 (8.5%)
Other	5 (4.7%)	7 (6.6%)
Missing	–	3 (2.8%)
SES ^a	41.1 (15.8)	–

Note. ^a*n* = 104 due to missing data; SES = socioeconomic status measured by Hollingshead Four Factor Index

(Table I). Four peers also had SB. Information regarding the type of SB, lesion level, shunt status, number of shunt revisions, and number of non-shunt surgeries is reported in Table II.

Table II. *Spina Bifida Characteristics*

	Percent or <i>M (SD)</i>
Type	
Myelomeningocele	84.0
Lipomeningocele	9.4
Myelocystocele	3.8
Lesion level	
Sacral	19.8
Lumbar	62.3
Thoracic	12.3
Hydrocephalus present	73.6
Has shunt	73.6
Number shunt revisions	2.62 (3.36)
Number non-shunt surgeries	3.04 (1.98)

Procedure

This study was approved by university and hospital Institutional Review Boards. At Time 1, data were collected during two separate 3-hr home visits by trained graduate and undergraduate research assistants. Informed consent from parents and assent from the child/adolescent were obtained at the first home visit. Informed consent from the peer's guardian was obtained either in person or via mail prior to the second home visit, which also occurred at the target child's house. Assent from the peer was obtained during the second visit.

During the first home visit, the parent and child were asked to identify a peer to participate—families were reminded of inclusion/exclusion criteria and asked to start by inviting the “closest” friend. Parents called the peer's parent to obtain consent for the researchers to contact them with further information. During the second home visit, the child and peer individually completed questionnaires and audio-taped interviews about their specific friendship and each individual's friendships in general. The questionnaires and interviews were the primary outcome measures for this study, but target children and peers also engaged in video-taped structured interaction tasks. Families and peers received gifts (i.e., T-shirts, pens) and monetary compensation (\$150 for families; \$50 for peers) for their participation.

Measures

Demographics

Parents of youth with SB completed a questionnaire regarding the child's age, ethnicity, and grade, as well as the parents' education level and occupation. The Hollingshead Four Factor Index was used to assess socioeconomic status (SES) based on parents' education and occupation

(Hollingshead, 1975). Higher scores indicate higher SES. Peers reported their age, ethnicity, school, and grade.

Interviews

Two interviews, one assessing friendships in general and the other assessing the dyadic friendship between the target child and peer, were developed for this study. The process of development included a review of the literature on peer relations during middle childhood and adolescence (Berndt & Ladd, 1989; Brown, 1990; Savin-Williams & Berndt, 1990; Steinberg, 2005), consultation with an expert in the field, Wyndol Furman (G. Holmbeck personal communication, October 17, 2005), item generation by one author (G.H.) and graduate and undergraduate research assistants during a research team meeting, refinement of the measure based on expert feedback from Furman, and pilot testing in the field.

The General Friendship Interview consisted of 46 items for the child with SB and 43 items for the peer (i.e., three items were specific to SB). Consistent with Cavell's (1990) model, this interview assessed aspects of social adjustment (peer acceptance, quality of friendships, perceived social competence), social performance (rate of interactions with friends), and social skills (asking friends to get together, choosing activities with friends) regarding the respondent's general friendships. Questions were open-ended (e.g., *How many friends do you have?*) or provided Likert-type scales (e.g., *Do you find it easy to make new friends?* with responses from 1 [*all of the time*] to 4 [*never*]). The following questions were examined in this article: number of friends, number of friends who are “online” friends, how many friends know that you have SB (SB only), how often other children are mean to respondents, how often respondents are mean to other children, number of days outside of school spent with friends, perceived competence in making new friends, whether respondents ask friends to get together, who chooses the activities to do together, and who respondents seek help from when feeling sad.

The Dyadic Friendship Interview consisted of 19 items for the target child and 18 items for the peer (one item asks the child with SB if he or she has told the peer about SB). This questionnaire assessed aspects of social adjustment, social performance, and social skills within the specific dyadic friendship between the target child and the participating peer. Analyses examined: (a) how close the friendship is (Likert-type response scale from 1 [*not close*] to 10 [*extremely close*]); (b) whether the selected friend is the child's “best” friend (i.e., yes or no); (c) how often they spend time together (Likert-type response scale from 1 [*less than once a month*] to 6 [*every day*]); and (d) who

comes up with ideas for what to do together (i.e., *me, my friend, we take turns, or someone else [e.g., a parent]*). See Figure 1 for a summary of the outcomes measured for general friendships and the dyadic friendship based on Cavell's (1990) model.

Reciprocity of the specific friendship was determined using two methods. First, we examined whether each child reported that the other was his or her best friend (i.e., responded yes) on the Dyadic Friendship Interview. Second, each child was asked to write his or her best friend's name on the Friendship Qualities Scale (described in the next section). We examined whether the name written on this scale matched the other child's name as a spontaneous best friend endorsement. The latter method of determining reciprocity was considered to be less influenced by social desirability since it was completed independently and privately by children.

Questionnaires

The Friendship Qualities Scale (Bukowski, Hoza, & Boivin, 1994) consists of 46 items across five scales of friendship qualities: companionship, conflict, help, security, and closeness. Respondents are asked to report their best friend by name and rate how true each statement was about his or her best friend (i.e., children and peers were free to choose any best friend, not just the friend on the visit) on a 5-point Likert scale with responses ranging from 1 (*not true*) to 5 (*really true*). Internal consistency coefficients ranged from acceptable to high ($\alpha = .63$ to $.89$ for children with SB and $\alpha = .67$ to $.90$ for peers).

The Children's Self Efficacy for Peer Interaction Scale (CSPI), consisting of 22 items, assessed children's perceived self-efficacy in social situations (a measure of social skills). Each item described a social situation and was followed by an incomplete statement requiring the subject to evaluate his or her ability to perform a verbal persuasive skill, such as asking kids to play. The subject responded whether the skill was "very hard, hard, easy, or very easy." This scale has demonstrated validity and adequate internal consistency (Wheeler & Ladd, 1982). Four items were dropped because the wording (e.g., "using your play area") was age-inappropriate. Cronbach alphas remained high ($\alpha = .82$ for children with SB, $\alpha = .86$ for peers). The total score was used in analyses.

The Emotional Support Questionnaire (ESQ), an extension of Slavin's Perceived Emotional/Personal Support Scale (PEPSS; Slavin, 1991), was used as a measure of the quality of respondents' friendships in general. The ESQ consisted of the PEPSS plus three additional

probes. The PEPSS requires individuals to nominate three individuals from each of three broad social categories: family members, non-family adults, and friends, for a possible total of nine individuals. Respondents rated each relationship by how much they talk about personal concerns, how close they feel to the individual, how much the individual rated talks to the respondent, and how satisfied they are with the support they receive. The PEPSS has demonstrated good internal consistency with adolescent populations (Slavin 1991). The three probes added for this study were (a) how much do the respondent and individual rated get upset with or mad at each other, (b) how much does the respondent play around and have fun with the individual rated, and (c) how sure the respondent is that this relationship will last no matter what. This extended version demonstrated good internal consistency in our sample (*children with SB*: family support $\alpha = .78$, adult support $\alpha = .84$, peer support $\alpha = .88$; *peers*: family support $\alpha = .86$, adult support $\alpha = .82$, peer support $\alpha = .86$).

Data Analysis

Dependent *t*-tests with 95% confidence intervals were used to compare youth with SB and their chosen peers on age and measures of social adjustment, social performance, and social skills that provided interval or ratio data (e.g., closeness of the relationship). Chi-square analyses were used to evaluate reciprocity of the friendship (i.e., whether each considered the other to be a best friend, measured using two methods) and categorical measures of social adjustment, performance, and skills (note that categories were condensed into 2×2 tables for most measures). The analyses were run a second time excluding the four peers who had SB; the pattern of results did not change so results including the full sample are presented. To examine the potential influence of age and gender and preserve the integrity of the paired data, we repeated the paired analyses separately for each gender and each age group (children ages 8–11 years; adolescents ages 12 years and up). These analyses were hypothesis generating. We considered alternative approaches to examining moderation but kept the paired analyses since our objective was to compare children with SB to their selected peers. Given the overall lack of data regarding these areas of social competence in this population, a significance value of $p < .05$ was used in all analyses. Effect sizes are interpreted as $.1 =$ small, $.3 =$ medium, and $.5 =$ large (Cohen, 1992).

Results

Preliminary Analyses

Variable distributions were checked for outliers and skew. Outliers (any response greater than three standard deviations from the mean) were detected and deleted for two variables: number of friends (number of cases removed for target children was 11, for peers, 5) and number of “online” friends (number removed for target children was 1, for peers, 0). Skewed variables (i.e., number of friends, number of “online” friends, and closeness of the relationship with the participating peer) were transformed using log transformations. Transformed variables were used in analyses, but means using the original scaling were reported in the text and table.

The Dyadic Friendship With the Chosen Peer

Most youth with SB chose peers who were the same age as themselves, $t(104) = 1.56, p > .05$. There was a significant association between the target child’s gender and the peer’s gender, $\chi^2(1) = 40.45, p < .01$; 81% of pairs were the same gender. Youth with SB and their chosen peers were compared on measures of social adjustment, social performance, and social skill regarding their specific friendship, with results below presented in Table III.

Social adjustment—peer acceptance

When asked to rate the closeness of their friendship on a 10-point Likert scale, youth with SB and peers both reported a high level of closeness in the friendship, SB $M = 8.55, SD = 1.91$, peer $M = 8.06, SD = 2.02$, but youth with SB tended to perceive the friendship as being closer than did peers, $t(103) = 2.41, p < .05, r = .23$.

As noted, reciprocity of the friendship was assessed via two methods: (a) the Dyadic Friendship Interview question about whether the other child was his or her best friend (i.e., yes or no) and (b) spontaneous nomination of the other child as one’s best friend on the Friendship Qualities Scale. The Dyadic Friendship Interview revealed a significant association between the target child’s report of the peer being his or her best friend and whether the peer reciprocated the designation as best friend, $\chi^2(1) = 6.00, p < .05$. In 67.6% of all pairs, both children reported that the other was his or her best friend. However, while 12.7% of target children did not reciprocate the best friend endorsement when peers reported target children to be their best friends, 17.9% of peers did not reciprocate when target children reported peers to be their best friends. For 75 pairs of friends, each child separately reported who was his or her best friend on the Friendship Qualities Scale (the reduced n is due to missing data

because both children had to report a specific name to be included in this analysis). Again, there was a significant association between the target child’s and peer’s reports of the other being his or her best friend, $\chi^2(1) = 4.07, p < .05$. On this item, only 43% of all pairs had both children reporting that the other child was his or her best friend. Among pairs where peers reported target children as best friends, only 17.9% of children with SB did not reciprocate the best friend nomination; however, when target children reported peers as best friends, 40.7% of peers did not reciprocate the nomination.

Social performance

Children with SB and peers reported a similar frequency of getting together, $t(100) = 1.19, ns$ (median was once per week for both groups).

Social skill

There was a significant association between youth with SB and peer report on who typically suggests that they get together, $\chi^2(4) = 11.88, p < .05$. Children with SB were more likely to state that their friend suggested getting together.

General Friendships

Youth with SB and their chosen peers were compared on measures of social adjustment, social performance, and social skill regarding general friendships (Table III).

Social adjustment—peer acceptance

Youth with SB and peers were similar in measures of peer acceptance; they reported similar numbers of friends, $t(78) = -1.45, ns$, and similar percentages of friends who were “online” friends, $t(90) = -0.10, ns$. Youth with SB reported that the majority of their friends (~67%) knew they had SB, with 37% of our sample reporting that all of their friends knew they had SB. Youth with SB and peers also reported experiencing similar levels of teasing by other children, $\chi^2(1) = 0.004, ns$.

Social adjustment—quality of friendships

Although youth with SB and their friends reported similar levels of conflict, $t(100) = 0.07, ns$ and help, $t(100) = 0.78, ns$, in their best friendships, youth with SB also reported lower degrees of companionship, $t(100) = -2.43, p < .05$, security, $t(100) = -2.34, p < .05$, and closeness, $t(100) = -2.21, p < .05$. Further, youth with SB reported receiving lower degrees of emotional support from their peer network, $t(93) = -2.91, p < .01$, and family, $t(98) = -2.19, p < .05$. There were no statistical differences between groups regarding who individuals sought

Table III. *Friendship Characteristics for Youth With SB and Chosen Peers*

Social outcome	Child with SB M(SD) or %	Peer M(SD) or %	Mean child-peer difference ^a [95% CI] or χ^2	Effect size <i>r</i> or Cramer's V
This specific friendship:				
<i>Social adjustment—peer acceptance</i>				
Closeness ^b	8.55 (1.91)	8.06 (2.02)	0.09 [0.02, 0.16]*	.23
Reciprocity of friendship (%)				
Does not reciprocate best friend endorsement (interview)	12.7	17.9	χ^2 (1) = 6.00*	.24
Does not reciprocate spontaneous best friend nomination (questionnaire) ^c	17.9	40.7	χ^2 (1) = 4.07*	.23
<i>Social performance</i>				
How often get together?			0.22 [-0.15, 0.58]	.12
<Once per month	11.3	13.2		
Once per month	8.5	8.5		
A couple of times per month	21.7	24.5		
Once per week	15.1	17.9		
A few times per week	21.7	26.4		
Everyday	18.9	6.6		
<i>Social skill</i>				
Who suggests getting together? ^{d,e}			χ^2 (4) = 11.88*	.27
Me	17.0	19.8		
My friend	28.3	11.3		
We take turns	44.3	53.8		
Someone else (e.g., parent)	7.5	13.2		
General friendships:				
<i>Social adjustment—peer acceptance</i>				
How many friends? ^b	12.72 (10.72)	14.02 (9.11)	-0.08 [-0.18, 0.03]	.16
Percent of friends who are "online" ^b	7.78 (20.47)	9.08 (21.25)	-0.001 [-0.02, 0.02]	.01
Percent of friends who know about SB? ^f	66.86 (39.50)	N/A	-	
How often are others mean to you?			χ^2 (1) = 0.00	.01
All of the time or some of the time	29.2	25.5		
Once in a while or never	69.8	72.6		
<i>Social adjustment—quality of friendships</i>				
Friendship qualities:				
Companionship	3.34 (0.85)	3.61 (0.83)	-0.26 [-0.48, -0.05]*	.24
Conflict	2.28 (1.04)	2.27 (0.88)	0.01 [-0.25, 0.27]	.01
Help	3.84 (0.80)	3.92 (0.76)	-0.08 [-0.29, 0.13]	.08
Security	4.07 (0.71)	4.28 (0.59)	-0.21 [-0.39, -0.03]*	.23
Closeness	3.93 (0.76)	4.15 (0.73)	-0.22 [-0.41, -0.02]*	.22
Social support				
Family	2.98 (0.44)	3.11 (0.49)	-0.13 [-0.26, -0.01]*	.22
Non-related adults	2.76 (0.50)	2.74 (0.49)	0.02 [-0.14, 0.19]	.03
Peers	3.13 (0.54)	3.34 (0.45)	-0.22 [-0.37, -0.07]**	.29
If you are sad, who do you go to for help? ^d			χ^2 (4) = 2.55	.12
Family	37.7	39.6		
Friends	19.8	30.2		
Family and friends equally	28.3	22.6		
Other (e.g., teacher, counselor)	9.4	5.7		
<i>Social adjustment—perceived competence</i>				
How easy do you find it to make friends?			χ^2 (1) = 0.01	.01
Very easy or somewhat easy	74.5	72.6		
Very difficult or somewhat difficult	23.6	26.4		

(continued)

Table III. Friendship Characteristics for Youth With SB and Chosen Peers

Social outcome	Child with SB <i>M(SD)</i> or %	Peer <i>M(SD)</i> or %	Mean child-peer difference ^a [95% CI] or χ^2	Effect size <i>r</i> or Cramer's <i>V</i>
<i>Social performance</i>				
Days spent with friends	2.70 (2.31)	3.47 (2.44)	-0.09 [-0.16, -0.01]*	.23
<i>Social skill</i>				
Do you ask your friends to do things?			$\chi^2(1) = 0.72$.08
All of the time or some of the time	68.9	77.4		
Once in a while or never	30.2	20.8		
Who usually chooses what activity to do?			$\chi^2(1) = 0.13$.04
I usually choose	31.1	34.0		
My friends usually choose	43.4	51.9		
Social self-efficacy	2.81 (0.46)	2.96 (0.44)	-0.15 [-0.27, -0.03]*	.23
How often are you mean to others?			$\chi^2(1) = 6.94^{**}$.26
All of the time or some of the time	17.9	9.4		
Once in a while or never	79.2	87.7		

Note. ^aFor interval level data, dependent *t*-tests examined differences between children with SB and peers; the mean difference with 95% CI is reported, and significance of *t*-test indicated; For categorical data, Chi-square tests were run and reported; ^bMeans are reported in original scaling but analyses used transformed data; ^cFriendship Qualities Scale, *n* = 75 due to missing data; ^dDue to wide variety of individuals captured by category 4, "Someone Else" or "Other," it was dropped and the Chi-square analysis was run with categories 1 through 3 only; ^eInterpretations must be made cautiously, as 44% of the cells had expected counts below 5, violating assumptions of chi-square test; ^fSB only.

p* < .05 *p* < .01.

for help when feeling sad, $\chi^2(4) = 2.55$, *ns*, but most youth reported going to their family for help (37.7% SB, 39.8% peers).

Social adjustment—perceived competence

Youth with SB and peers reported similar levels of perceived social competence regarding making new friends, $\chi^2(1) = 0.13$, *ns*.

Social performance

Youth with SB reported spending fewer days with friends outside of school during the past week, $t(96) = -2.31$, *p* < .05.

Social skill

Youth with SB and peers reported engaging in certain basic skills, such as asking friends to get together and choosing an activity, at similar rates, $\chi^2(1) = 0.72$, *ns*, and $\chi^2(1) = 0.13$, *ns*, respectively. However, peers reported greater social self-efficacy, $t(100) = -2.42$, *p* < .05. Additionally, youth with SB reported engaging in a negative social behavior (i.e., teasing or being mean to other children) more frequently than selected peers, $\chi^2(1) = 6.94$, *p* < .01.

Examination of Age and Gender

Results of analyses conducted separately for children and adolescents followed a similar pattern to the overall results, with some exceptions (see Supplementary Data online).

Differences in reported closeness of the dyadic friendship held for children but not adolescents. In terms of reciprocity of the friendship, the significant association in spontaneous best friendship nomination held only for adolescents, and, in contrast to the full sample results, adolescents with SB were slightly more likely to not reciprocate the endorsement by peers on the yes/no item. Further, differences in companionship and closeness of general friendships, as well as perceived social support from peers, was significant only for adolescents. A few domains failed to reach significance in at least one of the age groups, but demonstrated similar effect sizes to each other and the full sample, including security of friendships, days spent with friends, social self-efficacy, and frequency of being mean to others.

Similar to age, results of analyses conducted separately for boys and girls followed a similar pattern to the overall results, with some exceptions (see Supplementary Data online). Several domains significant in the full sample failed to reach significance in either gender group, but similar effect sizes were found. These domains included closeness of the dyadic friendship, reciprocation of the spontaneous best friend endorsement, who in the dyad suggests getting together, security of friendships, closeness of general friendships, and perceived support from peers. Although not significant in the full sample, we found that boys reported having fewer friends than their peers while girls reported similar numbers of friends. Also, differences

in companionship of friendship and days spent with friends were significant for boys but not girls. Finally, differences in perceived support from family, social self-efficacy, and frequency of being mean to others were significant for girls but not boys.

Discussion

In this article we examined social competence in the dyadic and general friendships of children and adolescents with SB based on Cavell's (1990) model, focusing on social adjustment, social performance, and social skills. With regard to general friendships, youth with SB and chosen peers were similar on measures of peer acceptance (e.g., number of friends) and perceived competence in making friends. In contrast to previous work (Ellerton et al., 1996), youth with SB had similar size social networks relative to peers. Youth with SB also reported engaging in certain basic social skills, such as asking a friend to get together, to the same degree as peers. With regard to dyadic friendships, youth with SB and selected friends were similar in terms of age and gender and reported frequently spending time together, with more than half of our sample spending time with their friend at least once per week. This similarity in terms of age is encouraging given previous work that suggested only about one-third of adolescents with SB reported their best friend to be the same age (Blum et al., 1991). However, we must interpret this cautiously as we asked children to choose a peer who was similar in age.

Despite similarities between youth with SB and their chosen friend, youth with SB tended to rate the friendship as somewhat closer than their friend perceived it to be. Further, although both youth with SB and the selected friend were likely to report the other to be their "best" friend, youth with SB were more likely to perceive the peer to be his or her best friend rather than the reverse (though this may not hold across age groups). These results generate some hypotheses for future research, such as examining whether youth with SB become more invested in a single or small number of friends compared with peers. However, there are important contextual and study design issues to consider when interpreting these results. First, reciprocity of the best friendship differed depending on how the question was asked. Peers were more likely to reciprocate when asked in yes/no format rather than when asked to provide a spontaneous best friend nomination. These results are consistent with other reports that youth with chronic conditions have lower levels of best friend nominations (e.g., Noll et al., 2007). The higher

percentage of agreement when asked to respond in a yes/no format may be due to social desirability, even though individuals were interviewed separately.

Second, the study design may have introduced a selection bias that influenced results. Because we were interested in having the child with SB recruit a peer whom he or she considered to be a friend, the child was likely to have a special attachment to the peer regardless of the peer's reciprocation of those feelings. Third, there was a significant amount of missing data for the analysis of spontaneous best friend nominations where youth were asked to name their best friend on a questionnaire. It is possible that these data were systematically missing, as children may have left the item blank if they viewed it as redundant or "obvious" given their participation in the study or if they did not want the other participating child to see a different name written down. Future studies including a comparison group of healthy peers who recruit a friend may help elucidate whether the differences found were due to methodological issues.

Compared with their close friend, youth with SB reported lower levels of social adjustment in terms of the quality of their best friendships, including lower levels of companionship, security, and closeness, though the effect sizes for these differences were small. On the other hand, target children and peers reported similar levels of conflict and help in their relationships. As noted by Antle, Montgomery, & Stapleford (2009), peers may serve as an important source of tangible support or help for youth with SB, such as helping to organize books or materials at school. Youth with SB also reported lower levels of emotional support from peers and family. Although lower levels of peer support were expected, a finding of lower levels of family support was contrary to research suggesting the importance of support from family, particularly mothers (e.g., Antle et al., 2009). One possible explanation relates to the format of the Emotional Support Questionnaire used in this study. Instead of asking youth to rate global levels of parent or family support, this questionnaire asked youth to nominate specific individuals from within their families and rate each individual separately. If youth had one primary caregiver for management of their SB, this caregiver may have been rated more positively or negatively relative to others (given the potential for positive or negative interactions around SB care), potentially resulting in a lower average family support score. Using multiple measures of family support in future studies would help clarify this issue.

Examination of the potential influence of age and gender yielded mostly similar results, though some of the differences found between youth with SB and their chosen peers held only for one age group or for one gender. In particular, it seemed like adolescents and boys reported differences in the level of companionship and closeness in their general friendships, while girls reported lower social self-efficacy. These areas deserve further research.

Although the study design provided a novel approach to understanding friendships, there were limitations. First, as noted above, allowing families to select a peer to participate provided interesting information regarding specific friendships in youth with SB, but also introduced a possible selection bias. Also, the results describe one friendship of a child with SB and may not generalize to all friendships. Second, the results reflect our interpretation of Cavell's model and how we operationalized the various constructs within the model. Third, the conduct of multiple analyses with the significance value set at .05 increased our chances of a Type I error. However, we believe that these results are valuable in informing future research given the lack of research examining multiple domains of social competence and dyadic relationships in youth with SB. Finally, the study is limited in that we relied solely on child and peer report. Since the larger study focused primarily on children with SB and their families, we did not have the additional resources needed to also obtain information from the peers' families and teachers.

In summary, youth with SB were successful in inviting a peer to participate and were similar to their invited peer in several ways (e.g., demographics). However, there were some small but significant differences in the ratings of youth with SB regarding the closeness and reciprocity of the dyadic friendship compared with peer ratings. Further, although youth with SB had similar numbers of friends and perceived similar levels of help and conflict within their friendships relative to peers, youth with SB reported experiencing lower levels of intimacy in their friendships (i.e., closeness, companionship, and security) compared with peers.

Results suggest that youth with SB may benefit from interventions geared toward enhancing the quality of their friendships. Social skills training can enhance perceived social support (Varni, Katz, Cosgrove, & Dolgin, 1993). Such interventions could focus on fostering intimacy through appropriate self-disclosure and empathic listening skills. These interventions could take place in a therapeutic group or a camp setting for youth with chronic conditions. However, it would be important to incorporate peers

without SB in these groups so that skills might translate more readily into daily life. Parents of youth with SB could foster social skills in their child by helping them practice conversational skills and encouraging opportunities for peer interactions outside of school, such as one-on-one interactions and group social activities.

Supplementary Data

Supplementary data can be found at: <http://www.jpepsy.oxfordjournals.org/>.

Funding

This research was supported by grants from the National Institute of Child Health and Human Development (RO1 HD048629) and the March of Dimes Birth Defects Foundation (12-FY01-0098). This study is part of an ongoing, longitudinal study.

Conflicts of interest: None declared.

References

- Ammerman, R. T., Van Hasselt, V. B., Hersen, M., & Moore, L. E. (1989). Assessment of social skills in visually impaired adolescents and their parents. *Behavioral Assessment, 11*, 327–351.
- Antle, B. J., Montgomery, G., & Stapleford, C. (2009). The many layers of social support: Capturing the voices of young people with spina bifida and their parents. *Health and Social Work, 34*, 97–106.
- Berndt, T. J. (1982). The features and effects of friendship in early adolescence. *Child Development, 53*, 1447–1460.
- Berndt, T. J., & Ladd, G. W. (Eds.) (1989). *Peer relationships in child development*. New York: Wiley.
- Blum, R. W., Resnick, M. D., Nelson, R., & St. Germaine, A. (1991). Family and peer issues among adolescents with SB and cerebral palsy. *Pediatrics, 88*, 280–285.
- Brown, B. B. (1990). Peer groups and peer cultures. In S. S. Feldman, & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 171–196). Cambridge, MA: Harvard University Press.
- Brown, T. M., Ris, M. D., Beebe, D., Ammerman, R. T., Oppenheimer, S. G., Yeates, K. O., & Enrile, B. G. (2008). Factors of biological risk and reserve associated with executive behaviors in children and adolescents with spina bifida myelomeningocele. *Child Neuropsychology, 14*, 118–134.

- Bukowski, W.M., & Hoza, B. (1989). Popularity and friendship: Issues in theory, measurement, and outcome. In T. J. Berndt, & G. W. Ladd (Eds.), *Peer relationships in child development* (pp. 15–45). New York: Wiley.
- Bukowski, W.M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the friendship qualities scales. *Journal of Social and Personal Relationships, 11*, 471–484.
- Cavell, T. A. (1990). Social adjustment, social performance, and social skills: A tri-component model of social competence. *Journal of Clinical Child Psychology, 19*, 111–122.
- Centers for Disease Control and Prevention (2008). Quick-stats: Spina bifida and anencephaly rates—United States, 1991, 1995, 2000, and 2005. *MMWR Weekly, 57*, 15.
- Cicchetti, D., & Bukowski, W. M. (1995). Developmental processes in peer relations and psychopathology. *Development and Psychopathology, 7*, 587–589.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159.
- Cunningham, S. D., Thomas, P. D., & Warschawsky, S. (2007). Gender differences in peer relations of children with neurodevelopmental conditions. *Rehabilitation Psychology, 52*, 331–337.
- Ellerton, M., Stewart, M. J., Ritchie, J. A., & Hirth, A. M. (1996). Social support in children with a chronic condition. *Canadian Journal of Nursing Research, 28*, 15–36.
- Fletcher, J. M., & Brei, T. J. (2010). Introduction: Spina bifida – a multidisciplinary perspective. *Developmental Disabilities Research Reviews, 16*, 1–5.
- Furman, W., & Robbins, P. (1985). What's the point?: Selection of treatment objectives. In B. Schneider, K. H. Rubin, & J. E. Ledingham (Eds.), *Children's peer relations: Issues in assessment and intervention* (pp. 41–54). New York: Springer.
- Hollingshead, A. A. (1975). *Four factor index of social status*. Unpublished manuscript, Yale University, New Haven, CT.
- Holmbeck, G. N., DeLucia, C., Essner, B., Kelly, L., Zebracki, K., Friedman, D., & Jandasek, B. (2010). Trajectories of psychosocial adjustment in adolescents with spina bifida: A 6-year, four-wave longitudinal follow-up. *Journal of Consulting and Clinical Psychology, 78*, 511–525.
- Holmbeck, G. N., & Devine, K. A. (2010). Psychosocial and family functioning in spina bifida. *Developmental Disabilities Research Reviews, 16*, 40–46.
- Holmbeck, G. N., Westhoven, V. C., Phillips, W. S., Bowers, R., Gruse, C., Nikolopoulos, T., & Totura, C. M. W. (2003). A multimethod, multi-informant, and multidimensional perspective on psychosocial adjustment in preadolescents with SB. *Journal of Consulting and Clinical Psychology, 71*, 782–796.
- LaGreca, A. M. (1992). Peer influences in pediatric chronic illness: An update. *Journal of Pediatric Psychology, 17*, 775–784.
- Meijer, S. A., Sinnema, G., Bijstra, J. O., Mellenbergh, G. J., & Wolters, W. H. G. (2000). Social functioning in children with chronic illness. *Journal for Child Psychology and Psychiatry, 41*, 309–317.
- Noll, R. B., Reiter-Purtill, J., Moore, B. D., Schorry, E. K., Lovell, A. M., Vannatta, K., & Gerhardt, C.A. (2007). Social, emotional, and behavioral functioning of children with NF1. *American Journal of Medical Genetics Part A, 143A*, 2261–2273.
- Parker, J. G., & Asher, S. R. (1993). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology, 29*, 611–621.
- Reiter-Purtill, J., Waller, J. M., & Noll, R. B. (2009). Empirical and theoretical perspectives on the peer relationships of children with chronic conditions. In M. C. Roberts, & R. G. Steele (Eds.), *Handbook of Pediatric Psychology*. New York: Guilford Press.
- Rose, B. M., & Holmbeck, G. N. (2007). Attention and executive functions in adolescents with spina bifida. *Journal of Pediatric Psychology, 32*, 983–994.
- Savin-Williams, R. C., & Berndt, T. J. (1990). Friendship and peer relations. In S. S. Feldman, & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 277–307). Cambridge, MA: Harvard University Press.
- Shaw, R. J. (2001). Treatment adherence in adolescents: Development and psychopathology. *Clinical Child Psychology and Psychiatry, 6*, 137–150.
- Slavin, L.A. (1991). Validation studies of the PEPSS, a measure of perceived emotional support for use with adolescents. *Journal of Adolescent Research, 6*, 316–335.
- Steinberg, L. (2005). *Adolescence*. Boston: McGraw-Hill.

Tin, L. G., & Teasdale, G. R. (1985). An observational study of the social adjustment of spina bifida children in integrated settings. *British Journal of Educational Psychology*, 55, 81–83.

Varni, J. W., Katz, E. R., Colegrove, R. Jr, & Dolgin, M. (1993). The impact of social skills training on the

adjustment of children with newly diagnosed cancer. *Journal of Pediatric Psychology*, 18, 751–767.

Wheeler, V. A., & Ladd, G. W. (1982). Assessment of children's self-efficacy for social interactions with peers. *Developmental Psychology*, 18, 795–805.