Predictors of Parenting Behavior Trajectories Among Families of Young Adolescents with and without Spina Bifida

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Objective To evaluate the utility of familial and parental variables in predicting trajectories of parenting behaviors among families of young adolescents with and without spina bifida (SB). **Method** Sixty-eight families with a child with SB and a demographically matched comparison group (CG) of 68 families of an able-bodied child participated. Observational and questionnaire assessments of parenting behavior were collected via home visits at three time points, as were reports of parent and family functioning. **Results** Family conflict was negatively associated with adaptive parenting behavior at Time 1 (T1), but positively associated with adaptive parenting change. Although the direction of this effect was the same across both groups, findings were more robust for the SB sample. Among fathers of children with SB, parenting stress was positively associated with adaptive parenting at T1 but negatively associated with adaptive parenting change. In contrast, within the CG, paternal parenting stress was negatively associated with adaptive parenting at T1 but showed no enduring negative effects in longitudinal analyses. **Conclusions** Family conflict and parenting stress were significant predictors of parenting behaviors and longitudinal parenting change. Findings are interpreted within a developmental context such that variables associated with maladaptive (or adaptive) parenting in the short run, may facilitate adaptive (or maladaptive) parenting over time based on young adolescents' changing developmental needs.

Key words adolescence; chronic illness; family; parenting; spina bifida.

Past research examining the impact of parenting behaviors on child and adolescent adjustment among typically developing children and adolescents has consistently found three parenting behaviors to be instrumental in promoting healthy psychosocial adjustment: (a) high levels of acceptance (a parenting behavior characterized by high levels of emotional support, positive evaluation, and expression of affection toward the child), (b) moderate to high levels of behavioral control (a behavior characterized by the establishment and enforcement of age-appropriate rules and expectations for child behavior), and (c) low levels of psychological control (a behavior characterized by covert and intrusive controlling of the child's emotions and behaviors, which inhibits autonomy development; Barber & Harmon, 2002; Baumrind, 1991a; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). Given the consistency of these findings, some have suggested that researchers begin examining factors that contribute to successful and competent parenting (Steinberg, 1990), where parenting is the *dependent* variable, rather than an *independent* variable.

Over the past three decades, several authors have proposed models that articulate familial and parental determinants of parenting. Empirically supported predictors within typically developing populations include marital adjustment (Brody, Flor, & Gibson, 1999; Pinderhughes, Dodge, Bates, Pettit, & Zelli, 2000), family conflict (Conger, Ge, Elder, Lorenz, & Simons, 1994; Dumka, Roosa, & Jackson, 1997), parental psychopathology

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(Bluestone & Tamis-LeMonda, 1999; Simons, Whitbeck, Conger, & Melby, 1990), and parenting stress (Bogenschneider, Small, & Tsay, 1997). Although such models have been informative, they are characterized by several deficiencies. First, because many of the current models have been evaluated in populations of parents with young children, less is known about the determinants of parenting in preadolescent and adolescent populations. Because the salience of parental or familial factors in predicting parenting behaviors likely differs across childhood and adolescence, predictors of adaptive parenting during early childhood may not be the same as predictors of adaptive parenting during adolescence. Moreover, parenting behaviors that are most valued at a given developmental period change over the course of childhood and adolescence (Holmbeck, Paikoff, & Brooks-Gunn, 1995).

In addition to focusing on a narrow age range of children, an additional weakness of past research has been the nearly exclusive focus on parents of typically developing youth. Consequently, less is known about the parenting of children with special needs, including those with a chronic condition such as spina bifida (SB). SB is one of the most common birth defects, affecting approximately 1 in 1,000 live births (Charney, 1992). It is characterized by the incomplete development of the spinal column, which results in neurological insult at or below the level of the spinal lesion and associated functional impairment in ambulation and bowel and bladder functioning. Additionally, SB is associated with a host of neuropsychological difficulties that result, in part, from cerebellar and hindbrain malformations that cause hydrocephalus and often necessitate shunt placement. The severity of SB varies as a function of the child's spinal lesion level and associated neurological complications (e.g., many shunt-related surgeries or infections).

Prior research has identified children with SB and their families as a population at risk for increased levels of psychosocial difficulties and family distress (Greenley, Holmbeck, Zukerman, & Buck, in press; Holmbeck et al., 2003). Moreover, research suggests that parents of children with SB tend to display higher levels of intrusiveness and overprotection than parents of able-bodied children do (Holmbeck, Shapera, & Hommeyer, 2002; Holmbeck, Johnson et al., 2002). Despite the existence of group differences, similar developmental processes may be present in both groups, such that the same variables relate to changes in adaptive parenting across groups. Indeed, a focus on the determinants of changes in parenting behavior may highlight key factors that influence the extent to which a parent is able to modify his/her parenting in a developmentally appropriate manner, even in the context of raising a child with a chronic illness. Moreover, because certain parenting behaviors (e.g., psychological control) are more prevalent among parents of children with chronic illnesses (Holmbeck, Shapera et al., 2002), a focus on this population affords an opportunity to study a phenomenon that is less common among families of typically developing offspring.

A third deficiency of past research relates to the fact that extant models of parenting determinants have devoted much more attention to understanding determinants of mothers' as opposed to fathers' parenting. This has occurred despite the growing body of research that supports the unique and important contributions of fathers. Because some authors have suggested that rearing a child with a chronic illness increases the likelihood that parents will assume more traditional roles within the family, it is important to examine determinants of mothers' and fathers' parenting separately within this population.

Finally, research to date that has focused on determinants of parenting has viewed parenting as a static entity, despite evidence in the literature to suggest that childrearing strategies evolve over time (Baumrind, 1991c; Holmbeck, Paikoff et al., 1995). As preadolescents enter the period of adolescence, changes in parenting behaviors are necessary to facilitate adolescent autonomy development (Baumrind, 1991b; Holmbeck, Paikoff et al., 1995; Steinberg, 1990). Generally, authors agree that decreases in parental control over both adolescent behavioral and emotional functioning domains are necessary to promote healthy adolescent adjustment (Baumrind, 1991c), as is consistency of high levels of warmth and acceptance (Hauser et al., 1984; Holmbeck, Paikoff et al., 1995; Powers, Hauser, Schwartz, Noam & Jacobson, 1983). Although the task of rearing a child with a chronic illness may present unique challenges for a parent in his or her ability to modify parental control and to provide age-appropriate levels of behavioral and emotional autonomy (Holmbeck et al., 2002; Holmbeck, Shapera et al., 2002), it is expected that children with SB would benefit from the same adjustments in parenting behavior during adolescence as typically developing children would, given that they likely have similar developmental needs for autonomy and independent functioning.

In addressing the deficits of past research, this study was designed to examine empirically the predictive validity of several familial and parental factors for longitudinal change in three specific parenting behaviors: acceptance, behavioral control, and psychological control within a

sample of youth with SB, as well as a matched comparison group (CG) of typically developing youth (see Figure 1 for an overview of the model). Because parents often modify their levels of control during the adolescent developmental period to allow for healthy adolescent development (Baumrind, 1991c), attention to factors that impact a parent's ability to appropriately adjust his/her parenting have important implications for adolescent adjustment. Past research on typically developing youth suggests several familial and parental factors may have utility in predicting parenting behaviors. Regarding family functioning, direct positive associations between quality of the marital relationship and adaptive parenting have been noted in the literature (Brody, Stoneman, Flor, & McCrary, 1994; Kendler, Sham, & MacLean, 1997), as have direct positive links between marital satisfaction or support and adaptive parenting (Brody et al., 1994; Simons et al., 1990; Simons, Lorenz, Wu, & Conger, 1993). In addition to these marital variables, level of conflict within the family is a factor that has been implicated. In fact, several studies have documented a direct relationship between increasing levels of family conflict and negative parental behavior including hostility (Conger et al, 1994), the use of power-assertive discipline methods (Katz & Woodin, 2002), low levels of parental support or involvement (Ary et al., 1999; Dumka et al, 1997), and negative parent–child interactions (Stoneman, Brody, & Burke, 1989).

Just as family functioning has been associated with adaptive parenting, so has parental functioning. In particular, two variables, parental psychological functioning and parenting stress have been associated with parenting behaviors in typically developing samples. Regarding parental psychological functioning, research has documented a strong direct link between clinical and subclinical parental psychiatric symptoms and parenting behavior (Bluestone & Tamis-LeMonda, 1999; Dumas & Wekerle, 1995; Kendler et al., 1997; Simons et al., 1990; Simons et al., 1993). Similarly, past research suggests that stress, even in mild degrees, is related to critical and intrusive parenting behaviors in samples of parents of children and adolescents (Bell, 1968; Bogenschneider et al., 1997; Maccoby & Martin, 1983).

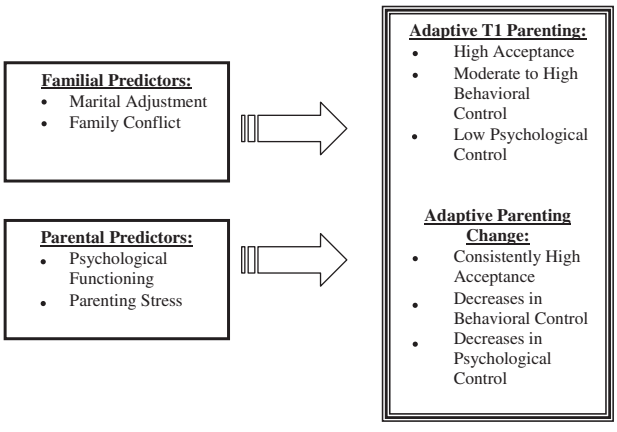

Figure 1. Hypothesized familial and parental predictors of adaptive parenting change.

Prior research has supported the utility of the aforementioned family and parental predictors of parenting behaviors among samples of parents of typically developing children. However, no research to date has evaluated the generalizability of such models to parents of children with a chronic condition or pediatric illness. Thus, an additional purpose of this study was to determine whether the predictors of adaptive changes in parenting vary across context. Specifically, this study evaluated whether differences exist in predictors of adaptive changes in parenting in families with and without a child with SB.

Several hypotheses guided this investigation. First, it was hypothesized that higher levels of marital adjustment and lower levels of family conflict at Time 1 (T1) would significantly predict adaptive parenting behaviors at T1, as well as adaptive changes in parenting during the adolescent transition. For the purposes of this investigation, adaptive parenting was defined as high levels of acceptance, moderate to high levels of behavioral control, and low levels of psychological control at T1. Adaptive parenting change was operationalized as consistency in high levels of acceptance and decreases in behavioral and psychological control over time. Second, it was expected that healthier parental psychological functioning and lower levels of parenting stress would predict the use of adaptive parenting strategies both cross-sectionally and longitudinally. Lastly, it was expected that the impact of familial and parental functioning on adaptive parenting change would be in the same direction and of a similar magnitude across both the SB group and CG, given the expectation that similar developmental processes would relate to adaptive parenting change across both groups and the lack of evidence supporting qualitative or quantitative differences in the link between family/parent functioning and parenting behaviors as a function of child illness status.

Method

Participants

Participants consisted of 68 families with a 8–9 year old child with SB at T1 (37 boys, 31 girls, *M* age = 8.34) and a demographically matched sample of 68 families with

Table I. Comparison of Demographic Variables Across Samples at Time 1

Demographic variable	Spina bifida group	Comparison group	Statistical test
Child age *M* (*SD*)	8.34 (0.48)	8.49 (0.50)	$t(134) = -1.75$
Mother's age *M* (*SD*)	37.34 (5.19)	37.74 (4.84)	$t(134) = 0.00$
Father's age *M* (*SD*)	41.02 (5.45)	40.63 (6.50)	$t(105) = 0.33$
Child birth order *M* (*SD*) *n*	2.12 (1.38)	2.06 (1.29)	$t(129) = 0.27$
Maternal report—family income[a] *M* (*SD*)	5.75 (2.57)	5.73 (2.45)	$t(130) = 0.05$
Paternal report—family income *M* (*SD*)	6.24 (2.50)	6.35 (2.22)	$t(105) = -0.24$
Hollingshead SES[b] *M* (*SD*)	43.12 (10.57)	46.46 (10.89)	$t(131) = -1.80$
Child gender			
Number of male (%)	37 (54.4)	37 (54.4)	$\chi^2(1) = 0.00$
Number of female (%)	31 (45.6)	31 (45.6)	
Child ethnicity			
Number of Caucasian (%)	56 (82.4)	62 (91.2)	$\chi^2(1) = 2.30$
Number of other (%)	12 (17.6)	6 (8.8)	
Marital status			
Number of two-parent intact (%)	55 (80.9)	47 (69.1)	$\chi^2(1) = 2.51$
Number of nonintact (%)	13 (19.1)	21 (30.9)	

$n = 68$ in each sample. All statistical tests were nonsignificant ($p < .05$).

[a]Family income was reported separately by mothers and fathers on a scale ranging from 1 to 11 with 1, <$10,000; 5, $40,000–49,999; 10, $90,999–99,999; and 11, >$100,000.

[b]The Hollingshead (1975) four-factor index of socioeconomic status (SES) is based on a composite of maternal education, paternal education, maternal occupational status, and paternal occupational status. Education codes for the Hollingshead range from 1 (less than seventh grade) to 7 (graduate or professional training), whereas occupational status codes range from 1 (farm laborers and menial service workers) to 9 (higher executives, proprietors of large businesses, and major professionals). The four-factor index is computed by (a) multiplying each parent's educational code by 3 and occupational code by 5, (b) summing maternal and paternal scores, and (c) computing the average. For example, a family with educational and occupational codes at the scale midpoint for each parent (i.e., 4.0 for education, 5.0 for occupational status) would receive a Hollingshead index rating of 37.

an 8- to 9-year-old able-bodied child (37 boys, 31 girls, *M* age = 8.49), all of whom were part of a larger longitudinal study investigating family relationships and psychosocial adjustment in children and adolescents with SB (Holmbeck et al., 2003; Holmbeck, Coakley, Hommeyer, Shapera, & Westhoven, 2002; Holmbeck et al., 2002; Holmbeck, Shapera et al., 2002). Complete demographic information for both groups is reported in Table I. A wide range of family incomes was represented in both samples, and the majority of participants were Caucasian (91% in the CG and 82% in the SB group). Although biological mothers from all families participated in the study, only 55 fathers/stepfathers in the SB group (81%) and 52 fathers/stepfathers in the CG (76%) participated at T1. Groups were successfully matched on all 10 demographic variables (Table I).

Information concerning several physical status variables of children in the SB group was collected from maternal report and medical chart reviews including (a) *spinal lesion level* (medical chart): 32% sacral, 54% lumbosacral or lumbar, 13% thoracic; (b) *SB type* (medical chart): 82% myelomeningocele, 12% lipomeningocele, 6% other; (c) *shunt status* (maternal report): 71% shunt, 29% no shunt; and (d) *ambulation* (maternal report): 19% no assistance, 63% assistance with braces; 18% assistance with a wheelchair. The average number of shunt surgeries among those with shunts was 2.50 (*SD* = 2.91).

As expected, a significant difference was found between the samples on a measure of receptive language [Peabody Picture Vocabulary Test—Revised (PPVT-R); Dunn & Dunn, 1981; *M* = 92.49, *SD* = 18.49 for the SB group and *M* = 108.97, *SD* = 15.06 for the CG]. This finding is consistent with prior research documenting that children with SB typically score in the low average range on tests of verbal IQ (e.g., Wills, Holmbeck, Dillon, & McLone, 1990). Because lower receptive vocabulary scores were viewed as part of the symptom presentation in children with SB, no attempt was made to match the samples on this variable.

Participant Recruitment

Children with SB between the ages of 8 and 9 years were recruited from two children's hospitals within a large midwestern city, a university-based medical center, and a statewide SB association (for detailed information about the recruitment strategy, see Holmbeck, Coakley et al., 2002). Of the 132 eligible families, 64 declined participation, resulting in a final sample of 68 families at T1. Analyses revealed no significant differences between participating children (*n* = 68) and those who declined

to participate (n = 64) for lesion levels, $\chi^2(2) = 0.62$, $p < 0.05$ or type of SB (myelomeningocele or lipomeningocele; $\chi^2(1) = 1.63$, $p < 0.05$). Children in the CG were recruited by contacting schools where the children with SB were enrolled. At participating schools, recruitment letters were distributed to parents of children in the appropriate age range. To obtain the sample of 68 children used in this investigation, approximately 1,700 letters were mailed. The low recruitment rate is attributable, in part, to the longitudinal nature of the study that was described in detail in the recruitment letter (see Holmbeck et al., 2003 for more information on the recruitment of the CG sample and sample matching procedures).

Procedure

Data for this study represent the first three waves of data collection from the larger longitudinal study following children with SB through middle childhood and adolescence. Information was obtained during three separate 3-hour home visits conducted by trained undergraduate and graduate research assistants, the first when children were 8–9 years of age (T1), the second when children were 10–11 years old (T2), and the third when children were 12–13 years old (T3). Each family was compensated for their participation at each time point. Across all time points, a similar method of data collection was utilized whereby informed consent (or child assent) was obtained from both parents and child at the start of the visit. Then, questionnaire packets were completed by parents. Additionally, children completed a series of questionnaires that were read aloud to them using an interview format to ensure child comprehension at T1 and as needed at subsequent time points (the majority of children at T2 and T3 completed questionnaires independently). After completing the questionnaires, families participated in a series of video and audiotaped interaction tasks that were later coded by trained research assistants. Of the 136 families (68 SB, 68 CG) who participated at T1, 133 families participated at T2 (67 SB, 66 CG), and 130 families participated at T3 (64 SB, 66 CG).

Dependent Variable: Parenting Behavior

Parental acceptance, behavioral control, and psychological control were assessed at T1, T2, and T3 for both mothers and fathers using an abbreviated version of the Child Report of Parenting Behavior Inventory (CRPBI; child-report version & parent-report version; Schaefer, 1965; Schuldermann & Schuldermann, 1970; Schwarz, Barton-Henry, & Pruzinsky, 1985) and a macrocoding system developed by Holmbeck, Belvedere, Gorey-Ferguson, and Schneider (1995) for use with observed family interaction data.

The CRPBI is a 108-item scale that taps three dimensions of parenting behavior: firm/lax control, acceptance/rejection, and psychological autonomy/psychological control. An abbreviated form of the CRPBI was utilized in this investigation. Sixteen items comprised the acceptance scale and were taken from the acceptance and rejection (reverse-coded) subscales. Fifteen items comprised the behavioral control scale and were taken from the control, enforcement, and lax discipline (reverse-coded) subscales. Thirteen items comprised the psychological control scale and were taken from the intrusiveness and hostile control subscales. Each item was rated by the participant using a three-point Likert scale ranging from 0 to 2, with higher scores indicative of higher levels of the construct. Children rated maternal and paternal parenting behaviors separately, while parents responded to a parallel questionnaire in which they rated their own behavior. Child report and parent report of parenting behavior were combined to form composite questionnaire ratings of parenting behavior, which was justified on the basis of the moderate positive correlations between child and parent reports (average correlation between child and mother report r = 0.24; average correlation between child and father report r = 0.22) and the improved reliabilities of the composite scales in comparison to the individual scales. Alphas for the composite ratings of maternal parenting ranged from .67 to .82 in the SB group and from .64 to .91 in the CG. Alphas for composite ratings of paternal parenting ranged from .66 to .89 in the SB group and from .73 to .90 in the CG.

Selected scales from the Holmbeck, Belvedere, et al. (1995) macrocoding system (based on a system developed by Smetana, Yau, Restrepo, and Braeges, 1991) were also used as measures of parental acceptance, behavioral control, and psychological control. Indices of observed parenting behavior were derived from the coding of videotapes of three family interaction tasks (a conflict discussion task, an unfamiliar game task, and a structured-family interaction task), during which both parents and the target child participated. Coders viewed a single family interaction task and provided a five-point Likert scale rating on a variety of dimensions for that task.

The parental acceptance scale consisted of the following codes: listens to others, humor and laughter, warmth, anger (reverse-coded), and supportiveness. The behavioral control scale was made up of the following codes: overt power, nature of parental control—permissive (reverse-coded), and parental structuring of task. Finally,

the psychological control scale was comprised of the following codes: pressures others to agree, nature of parental control—democratic (reverse-coded), tolerates differences and disagreements (reverse-coded), receptive to statements made by others (reverse-coded), and nature of parental control—overprotective. For each of the three tasks, behaviors were rated by two coders, and item level means of the two raters for each task were averaged across the three tasks to yield a single score for each coding item for each family. Behaviors were rated separately for mothers and fathers using a five-point Likert scale, with higher scores indicative of higher levels of the construct. Two research assistants rated each of the codes for all three interaction tasks after undergoing extensive training and demonstrating 90% agreement with an expert coder. Adequate scale and rater reliabilities for all three maternal parenting behaviors were documented across the SB groups (rater α range = .55–.79, M α = .70; scale α range = .58–.86, M α = .73) and CG (rater α range = .53–.85, M α = .71; scale α range = .68–.85, M α = .77). Similarly, adequate scale and rater reliabilities for all three paternal parenting behaviors were documented across the SB (rater α range = .59–.91, M α = .80; scale α range = .67–.88,M α = .82) and CG groups (rater α range = .62-.86, M α = .75; scale α range = .62–.80, M α = .72).

Independent Variables: Family Measures

Marital Adjustment. Marital adjustment was assessed at T1 using a modified version of the Dyadic Adjustment Scale (DAS; Spanier, 1989). Parents responded to 30 items about their relationship with their spouse using a five- or six-point Likert scale, depending upon the item. Higher scores on this measure were indicative of higher levels of marital adjustment. Two items that referred to sexual activity were dropped from the original 32-item questionnaire due to the personal nature of these items. In addition, given the significant correlations between mother and father reports (DAS r = 0.60, p = .000 for CG, r = 0.47, p = .000 for SB group), parent reports were combined to create a composite variable, which yielded adequate reliability (α = .92 for SB; α = .72 for CG).

Family Conflict. Family conflict was assessed at T1 using the conflict subscale of the Family Environment Scale (FES; Moos & Moos, 1981) completed by mothers and fathers; as well as by observational ratings of family conflict at T1 assessed using the Holmbeck, Belvedere, et al. (1995) macrocoding system.

The FES (Moos & Moos, 1981) is a 90-item measure of family climate, which has been validated for use with chronically ill children (Kronenberger & Thompson, 1990). For the purposes of this investigation, only the T1 conflict subscale was utilized. This scale consists of nine items that were answered using a yes/no format at T1. Higher scores on the conflict subscale are indicative of higher levels of conflict. Given significant correlations between mother and father report (r = 0.63, p = .000 for CG; r = 0.35, p = .011 for SB), maternal and paternal reports were collapsed to form parental composite variables, which evidenced adequate internal consistency (α = .72 for SB; α = .84 for CG).

Observational ratings of family conflict were collected at T1 using the macrocoding system (Holmbeck, Belvedere et al., 1995). An overall index of family conflict was computed by averaging raters' endorsements of behaviors on items assessing the level of conflict within each dyad (i.e., mother–father, mother–child, father–child). Dyadic conflict was rated on three separate interaction tasks by two independent raters using a five-point Likert scale, with higher scores indicative of higher levels of observed conflict. Adequate scale and rater reliabilities were documented for the conflict variables across both samples (α rater = .74 for SB; α rater = .70 for CG; α scale = .58 for SB; α scale = .83 for CG).

Independent Variables: Parent Measures

Parental Psychological Functioning. Both mothers and fathers completed the Symptom Checklist-90—Revised (SCL-90-R; Derogatis, 1994) at T1 as a measure of parental psychological symptomatology over the past week. The SCL-90-R is a 90-item measure that asks parents to rate the extent to which they have experienced somatic or psychological symptoms and to rate the degree to which these symptoms have been distressing on a five-point Likert scale, with higher scores suggesting the presence of more psychological symptoms. In this investigation, the Global Symptom Index (GSI) was used as a measure of parent psychological functioning. Reliabilities for maternal psychological functioning were 0.96 and 0.96 for SB and CG, respectively. Reliabilities for paternal psychological functioning were 0.95 and 0.94 for SB and CG, respectively.

Parenting Stress. Parents completed three subscales (role restriction, competence, and isolation) from the Parenting Stress Index (PSI; Abidin, 1983) at T1, producing a 24-item measure of the stresses associated with parenting. Parents were asked to rate on a five-point Likert scale the extent to which they agreed with a series of statements about being a parent, with higher scores suggestive of higher levels of parenting stress. Reliabilities for maternal parenting stress were 0.89 (SB) and 0.84

(CG), and for paternal parenting stress were 0.83 (SB) and 0.79 (CG).

Results

Analytic Strategy

Hierarchical linear modeling (HLM) was used to test all hypotheses in this investigation. Models were tested using HLM version 5© (Scientific Software International, Inc., Lincolnwood, IL, 2003). To compare the differential predictive utility of the variables across illness context, models were evaluated separately for the SB and CG. Separate HLM models were also run for each parenting behavior of interest (i.e., acceptance, behavioral control, and psychological control) and for questionnaire versus observational assessments of parenting. Moreover, analyses were conducted separately for mothers and fathers. Finally, family and parental domains were evaluated in separate HLM models.

In the HLM models, the level 1 model, which tested (a) whether there was significant variability in the initial status of the given parenting variable and (b) whether there was significant variability in the change trajectory of a given parenting variable over time, was evaluated first. For each parenting variable, if significant variability was documented in initial parenting status (i.e., T1 parenting behavior) or parenting change trajectories (i.e., a slope was computed for each parent to assess parenting change across T1, T2, and T3), then the level 2 analysis, which assessed whether the hypothesized variables significantly predicted initial status of parenting or the parenting change trajectory, was also evaluated.

To find the best fitting model for each domain (family or parent), all predictor variables within a given domain were entered into an initial HLM model. Results of this preliminary model were evaluated, and whenever a predictor was not significant at the $p = .10$ level or better, it was eliminated, and a reduced model was tested. This reduced model consisted of only those predictors that were significant at least at the $p = .10$ level in the first analysis. This strategy was employed because the t ratio and associated p value obtained for each individual predictor is an estimate of how much variance is explained by that predictor *after* accounting for the variance explained by all of the other predictors in the model (Bryk & Raudenbush, 1992), and as such, is a conservative estimate of the utility of any given predictor. In all cases, this "reduced model" strategy resulted in improved fit of the follow-up models relative to the initial models.

In all analyses, predictors were based on T1 assessment of parent or family functioning, whereas parenting behaviors were assessed across Times 1, 2, and 3 (T1→T3). Whenever variables were significantly skewed, transformations were performed to create approximately normal distributions (Tabachnick & Fidell, 2001). Square root and logarithmic transformations were used for all variables that were positively skewed. When variables were negatively skewed, the scale was first reflected and then transformed using a square root or logarithmic transformation. In all cases, square root transformations were attempted first, and when such transformations failed to create normal distributions, logarithmic transformations were used. Square root transformations were successful in eliminating skewness for maternal psychosocial functioning (SCL-90-R) and paternal psychosocial functioning (SCL-90-R). Logarithmic transformations were used for the following variables to reduce significant skewness: parental composite of marital adjustment (DAS), observational assessment of family conflict, child–parent composite questionnaire ratings of maternal and paternal acceptance at T1→T3, observational ratings of maternal behavioral control at T1→T3, and observational ratings of paternal psychological control at T1→T3. Finally, as suggested by Bryk and Raudenbush (1992), continuous predictor and outcome variables were centered around the mean of each subsample to facilitate data interpretation. Space limitations did not allow for all significant findings to be tabled. Instead, a representative sampling of significant findings were reported in table format, although coefficients and accompanying t tests of significance are reported in the text for all significant findings.

Tests of Hypotheses

Level-1: Assessment of Individual Variability in Initial Status and Slope

In this study, significant variability in initial status (i.e., T1 parenting behaviors) was found in all cases. Moreover, in the majority of cases, significant variability was documented in individual parenting change trajectories across both groups. No significant variability in parenting change trajectories was found in the following 8 of 24 cases: (1) observer report of maternal psychological control SB group; (2) observer report of paternal behavioral control SB group; (3) questionnaire report of maternal behavioral control SB group; (4) observer report of maternal acceptance CG; (5) observer report of maternal behavioral control CG; (6) observer report of maternal psychological control CG; (7) observer report of paternal psychological control CG; and (8) questionnaire report of maternal acceptance CG. In these cases, level 2 models were not evaluated.

Level 2: Familial Predictors of Initial Parenting Status and Parenting Change Trajectories

It was hypothesized that higher levels of T1 marital adjustment and lower levels of T1 family conflict would be associated with adaptive parenting at T1, as well as adaptive changes in parenting during the adolescent transition. Regarding marital adjustment, higher levels of marital adjustment at T1 significantly predicted lower levels of T1 questionnaire-reported paternal acceptance among fathers in the SB group, a finding contrary to hypothesis (coefficient = 0.10, $t = 2.17$, $p < .05$). No significant relationships emerged between T1 marital adjustment and parenting behavior among mothers in the SB group. Similarly, no significant relationships were documented between marital adjustment and either maternal or paternal parenting behaviors at T1 among parents in the CG.

In longitudinal analyses, higher marital adjustment at T1 significantly predicted increases in observer report of maternal behavioral control within the SB group over time, a finding contrary to prediction (coefficient = −0.10, $t = -2.24$, $p < .05$). No support for the relationship between marital adjustment and adaptive parenting change was found among fathers of children with SB or among mothers or fathers of CG children.

In contrast, family conflict (and particularly observed family conflict) was a salient predictor of T1 parenting behaviors. Among parents of children with SB, higher levels of observed conflict at T1 were associated with lower levels of T1 observed maternal acceptance (coefficient = −1.82, $t = -3.82$, $p < .01$; Table II), higher levels of T1 observed maternal psychological control (coefficient = 1.72, $t = 4.37$, $p < .01$), lower levels of T1 observed paternal acceptance (coefficient = −3.73, $t = -4.36$, $p < .01$; Table III), lower levels of T1 questionnaire-reported paternal acceptance (coefficient = 0.18, $t = 2.17$, $p < .05$; Table IV), lower levels of T1 observed paternal behavioral control (coefficient = −1.95, $t = -3.48$, $p < .01$), and higher levels of T1 observed paternal psychological control (coefficient = 0.68, $t = 4.83$, $p < .01$; Table V). Findings were consistent with prediction. In contrast, questionnaire reports of family conflict (FES) significantly predicted lower levels of observed paternal psychological control at T1 (coefficient = −0.10, $t = -2.52$, $p < .05$; Table V), a finding contrary to prediction.

A similar pattern emerged with respect to the relationship between family conflict and parenting behavior in the CG. Consistent with the hypotheses, higher levels of observed family conflict at T1 were associated with several maternal parenting behaviors including lower levels of observed maternal acceptance (coefficient = −2.27, $t = -9.15$, $p < .01$), lower levels of observed maternal behavioral control (coefficient = 0.30, $t = 2.81$, $p < .01$), and higher levels of both observed (coefficient = 1.98, $t = 7.26$, $p < .01$) and questionnaire-reported maternal psychological control (coefficient = 0.77, $t = 3.10$, $p < .01$; Table VI) at T1. As predicted, observed family conflict was also related toT1 paternal parenting behaviors in the expected direction, including a negative association with observed paternal acceptance (coefficient = −2.24, $t = -7.24$, $p < .01$; Table VII) and a positive association with observed paternal psychological control (coefficient = 0.55, $t = 5.95$, $p < .01$). Finally, higher levels of questionnaire-reported family conflict were associated with lower levels of T1 questionnaire-reported maternal acceptance (coefficient = 0.10, $t = 3.60$, $p < .01$) and lower levels of T1 questionnaire-reported paternal acceptance (coefficient = 0.12, $t = 2.95$, $p < .01$), as hypothesized.

In longitudinal models, higher levels of T1 observed family conflict in the SB sample predicted

Table II. Familial Predictors of Observed Maternal Acceptance in the Spina Bifida Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	−0.001	0.040	−0.013
Macrocoding family conflict, β_{01}	−1.819	0.476	−3.823**
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	0.002	0.021	0.117
Macrocoding family conflict, β_{11}	0.542	0.247	2.196*
Random effect	Variance component	*df*	χ^2
Initial status, r_{0i}	0.110	50	226.190**
Time slope, r_{1i}	0.011	50	84.637**
Level 1 error, ε_{ti}	0.040		

The top section of the table provides information regarding significance of the level 2 analysis, while the bottom half reports information on the level 1 analysis.
*$p < .05$. **$p < .01$.

Table III. Familial Predictors of Observed Paternal Acceptance in the Spina Bifida Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	0.066	0.056	1.179
Macrocoding family conflict, β_{01}	−3.730	0.857	−4.355**
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	−0.017	0.034	−0.499
Macrocoding family conflict, β_{11}	1.227	0.393	3.119**
Random effect	Variance component	*df*	χ^2
Initial status, r_{0i}	0.223	36	224.211**
Time slope, r_{1i}	0.028	36	68.716**
Level 1 error, ε_{ti}	0.041		

**$p < .01$.

Table IV. Familial Predictors of Questionnaire Paternal Acceptance in the Spina Bifida Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	−0.002	0.008	−0.252
Macrocoding family conflict, β_{01}	0.178	0.079	2.247*
Marital adjustment, β_{02}	0.098	0.045	2.166*
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	−0.004	0.006	−0.557
Macrocoding family conflict, β_{11}	0.106	0.072	1.473
Marital adjustment, β_{12}	−0.063	0.047	−1.350
Random effect	Variance component	*df*	χ^2
Initial status, r_{0i}	0.002	46	104.816**
Time slope, r_{1i}	0.001	46	96.245**
Level 1 error, ε_{ti}	0.002		

Variable was reflected and then transformed so lower scores are indicative of higher acceptance.
*$p < .05$. **$p < .01$.

Table V. Familial Predictors of Observed Paternal Psychological Control in the Spina Bifida Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	−0.011	0.010	−1.138
FES family conflict, β_{01}	−0.098	0.039	−2.522*
Macrocoding family conflict, β_{02}	0.680	0.141	4.834**
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	0.003	0.005	0.615
FES family conflict, β_{11}	0.042	0.023	1.822
Macrocoding family conflict, β_{12}	−0.231	0.059	−3.885**
Random effect	Variance component	*df*	χ^2
Initial status, r_{0i}	0.005	36	189.021**
Time slope, r_{1i}	0.001	36	61.309**
Level-1 error, ε_{ti}	0.001		

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

Table VI. Familial Predictors of Questionnaire Maternal Psychological Control in the Comparison Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	0.001	0.024	0.029
Macrocoding family conflict, β_{01}	0.765	0.247	3.097**
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	0.001	0.014	0.058
Macrocoding family conflict, β_{11}	0.004	0.148	0.028
Random effect	Variance component	*df*	χ^2
Initial status, r_{0i}	0.027	60	150.268**
Time slope, r_{1i}	0.004	60	81.506*
Level-1 error, ε_{ti}	0.022		

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

(a) increases in observational accounts of maternal acceptance (coefficient = 0.54, $t = 2.20$, $p < .05$; see Table II), (b) increases in questionnaire reports of paternal acceptance (coefficient = 1.23, $t = 3.12$, $p < .01$; see Table III), and (c) decreases in observed paternal psychological control (coefficient = −0.23, $t = -3.89$, $p < .01$; see Table V), findings contrary to prediction. Similarly, within the CG, higher levels of observed family conflict significantly predicted increases in observed paternal acceptance over time (coefficient = 0.94, $t = 4.02$, $p < .01$; Table VII), a finding that was contrary to hypothesis. FES family conflict was not significantly associated with parenting change in either group.[1]

[1]On the basis of reviewer suggestions, analyses were also conducted separately for maternal and paternal report of family conflict via the FES (in contrast to using the parental composite FES variable). Results of these analyses yielded few significant associations with parenting outcomes in either the SB or CG, as was the case when the parental composite FES variable was utilized. Consequently, only analyses using the parental composite FES variable were reported in this article.

Table VII. Familial Predictors of Observed Paternal Acceptance in the Comparison Group

Fixed effect	Coefficient	*SE*	*t* ratio
Model for initial status, π_{0i}			
Average initial status, β_{00}	0.008	0.033	0.225
Macrocoding family conflict, β_{01}	−2.242	0.309	−7.244**
Model for growth rate, π_{1i}			
Mean growth rate, β_{10}	0.001	0.024	0.041
Macrocoding family conflict, β_{11}	0.943	0.234	4.023**
Random effect	**Variance component**	***df***	χ^2
Initial status, r_{0i}	0.065	42	96.763**
Time slope, r_{1i}	0.011	42	59.249*
Level-1 error, ε_{ti}	0.051		

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

Level-2: Parental Predictors of Initial Parenting Status and Parenting Change Trajectories

At the parental level, it was predicted that healthier parental psychological functioning and lower levels of parenting stress would predict adaptive parenting at T1, as well as adaptive parenting change trajectories.

Few significant relationships were documented between T1 parental psychological functioning and T1 parenting behavior within either group. Specifically, no relationship emerged between maternal psychological symptoms and parenting within either group. Among fathers of children with SB, higher levels of psychiatric symptoms predicted higher levels of questionnaire-reported behavioral control at T1 (coefficient = 0.20, $t = 2.02$, $p < .05$), a finding contrary to prediction. No relationship between psychological functioning and T1 paternal parenting behavior emerged in the CG.

Regarding predictors of longitudinal parenting change, no significant associations were documented between parental psychological functioning and parenting change in either the SB or CGs. As such, results of the current investigation failed to support this hypothesis.

Several significant relationships emerged between levels of parenting stress at T1 and fathers' but not mothers' T1 parenting behaviors. Within the SB group, T1 parenting stress was positively associated with observed paternal acceptance, contrary to hypothesis (coefficient = 0.41, $t = 2.61$, $p < .01$). Among fathers in the CG, higher parenting stress predicted lower levels of questionnaire-reported paternal acceptance (coefficient = 0.06, $t = 2.47$, $p < .05$), but higher levels of questionnaire-reported paternal behavioral control (coefficient = 0.20, $t = 2.30$, $p < .05$).

In longitudinal analyses, higher levels of parenting stress were significantly associated with decreases in observed acceptance (coefficient = −0.19, $t = -.09$, $p < .05$) and increases in observed psychological control across T1→T3 (coefficient = 0.03, $t = 2.13$, $p < .05$) among fathers of children with SB, findings that support the hypothesis. In contrast, no associations were found between parenting stress and parenting change among fathers of comparison children.[2]

Discussion

This study was designed to evaluate empirically the utility of several familial and parental factors as predictors of adaptive parenting behaviors during the adolescent transition. An additional purpose of this investigation was to determine the extent to which predictors of adaptive parenting varied across illness context. Specifically, this study sought to delineate potential differences in predictors of adaptive parenting between families with a child who has SB and demographically matched families with an able-bodied child. Several strengths of this investigation are noteworthy, including the use of a statistical method (i.e., HLM) that allows for an examination of longitudinal intraindividual changes in parenting behavior (i.e., across T1→T3), the inclusion of both mothers and fathers, the use of both questionnaire and observational indices of predictors and outcomes, and the focus on extending the literature on developmental processes of adolescence to a pediatric population.

Overall, several variables demonstrated efficacy in the prediction of parenting change trajectories during the adolescent transition. Within the family domain, observed family conflict emerged as a significant predictor of T1 parenting, as well as of parenting change trajectories. Analyses revealed an association between higher levels of T1 conflict and less adaptive parenting behavior at T1 across both groups. Interestingly, however, the relationship between family conflict and parenting change was in the direction opposite of prediction, such that higher levels of family conflict at T1 were associated with more adaptive changes in parenting during the adolescent transition. This finding was

[2]On the basis of reviewer suggestions, models testing the predictive utility of several child variables, including child gender, illness status (presence vs. absence of SB), and illness severity (a composite variable including the following illness parameters-lesion level, type of SB, shunt status, and ambulation status) were also evaluated. Few associations were found between these predictors and either concurrent or longitudinal changes in parenting behavior. Given that child-level variables offered little predictive utility, and due to space considerations, detailed information about these analyses was not included in this article.

documented for both maternal and paternal acceptance, as well as paternal psychological control, and appeared more robust for families of children with SB. Taken together, these findings suggest that although family conflict may negatively impact the parenting behavior a caregiver utilizes in the short term, such conflict may serve to promote a restructuring of the parent–child relationship over time in adaptive ways within healthy functioning families (Cooper, 1988; Holmbeck, 1996). That is, the presence of conflict between parent and child during late childhood may serve as a signal to parents of an impending developmental transition in which their preadolescent is striving for more autonomy. Parents, in this investigation, although negatively impacted by such conflict in the short term, seem able to adjust their parenting behavior by increasing levels of acceptance and reducing levels of psychological control over time.

Within the parental domain, some limited support was documented for a relationship between higher parenting stress and less adaptive parenting behavior at T1; however, this finding was documented among fathers in the CG only. In contrast, cross-sectional analyses documented that higher levels of paternal parenting stress were associated with higher levels of paternal acceptance in the SB group. Finally, longitudinal analyses revealed that higher levels of parenting stress at T1 predicted less adaptive parenting changes over time among fathers in the SB group. These findings are noteworthy in several respects. First, it appears that the impact of parenting stress on parenting behaviors is more pronounced for fathers than mothers in this investigation. Second, among fathers of comparison children, high levels of stress may have a negative impact in the short term, but this negative relationship may not persist over time. In contrast, among fathers of children with SB, parenting stress may initially lead to the use of more adaptive parenting behaviors; however, over time, fathers with high stress levels may be less able to effectively adjust their parenting during the adolescent transition.

Surprisingly, marital adjustment and parental psychological functioning showed little utility in predicting parenting behaviors either cross-sectionally or longitudinally in either sample. Within this investigation, although variability in marital adjustment and parental psychological functioning existed, the variability was modest, and clinically significant levels of dysfunction were uncommon. In contrast, past research on determinants of parenting behaviors has employed primarily samples of individuals with clinically significant levels of dysfunction. Thus, normal variations in parental psychological functioning and marital adjustment may offer less explanatory value than more extreme or dysfunctional patterns of functioning. Alternatively, marital and parental adjustment may have been less associated with parenting behaviors than family conflict and parenting stress because variance in the latter predictors *and* variance in parenting behaviors can both be attributed, in part, to child functioning (whereas marital and parental adjustment cannot be attributed to child functioning to the same degree).

Taken together, these findings suggest that different models may explain static parenting behaviors (e.g., a parent's behavior at any one point in time) and parenting change trajectories both among parents of children with a pediatric chronic condition, as well as among parents of an able-bodied child. Past models of determinants of parenting behaviors that have conceptualized parenting as a static entity (i.e., only assessed parenting at one point in time) may not be generalizable to understanding determinants of parenting change over time. To understand factors that influence parenting change, future research may need to examine patterns of parent and family functioning over time by employing longitudinally assessed predictors or by investigating bidirectional effects.

In addition, current findings suggest some similarities in the determinants of adaptive parenting behaviors across illness groups. Specifically, across both the SB and comparison samples, family conflict was found to predict less adaptive parenting behaviors at T1, and more adaptive parenting change trajectories over time. Although the direction of the effect was similar across groups, the findings were more robust among parents of children with SB. Additionally, although the familial determinants of parenting change were found to be similar across both samples, parental determinants of adaptive parenting change, and in particular parenting stress, varied across illness context.

Though this investigation yielded useful information regarding familial and parental correlates of adaptive parenting change, several limitations should be acknowledged. First, cross-sectional analyses do not provide conclusive information about the direction of the effect. One plausible hypothesis, articulated throughout this discussion, is that various familial and parental factors at T1 were associated with parenting behaviors at T1. An alternative, and equally plausible hypothesis, however, is that parenting behaviors at T1 may have influenced functioning in the aforementioned familial or parental domains. Second, many of the documented relationships (particularly with respect to family conflict) were between measures based on the same

method of reporting. As such, common method variance cannot be ruled out as an explanation for these significant findings (although findings for observational → questionnaire relations were consistent with those found for relations involving only observational data). In addition, the present study employed a relatively small sample size (n = 68 per group), and data from fathers were not available for all families across all time points. Moreover, although the attrition rate was low across T1→T3, there was some subject loss over time. HLM procedures necessitate that at least three data points be present to assess longitudinal models of change, and that models are estimated more reliably with more than three data points. The relatively small sample size in each group, coupled with some attrition over time may have contributed to lower power to detect significant effects. As such, it is recommended that future studies employ larger sample sizes and more data collection points.

An additional weakness relates to the generalizability of the present findings, which is limited in several respects. First, the majority of participants in this investigation were middle-class Caucasian families; Latino youth and their families were particularly underrepresented in this study. Among families of lower socioeconomic backgrounds, stressors associated with economic strain may influence parenting behaviors (Elder, Eccles, Ardelt, & Lord, 1995; Simons, Whitbeck, Melby, & Wu, 1994) and may be more salient predictors of parenting trajectories than the familial or parental domains assessed. Second, within the two subsamples, parent and family functioning were generally within the normal range. Additionally, although this investigation followed children across three time points (a 6 year period from age 8–9 to age 12–13), the sample of preadolescents utilized in this investigation may have been too young to obtain a clear picture of changes in parenting during the adolescent transition. Instead, it may have been preferable to follow participants longer into adolescence to truly understand the pattern of changes in parenting behavior during adolescence. This may be particularly true of children in the SB sample who tend to be less socially mature than their able-bodied counterparts and may begin to strive for greater independence from their parents later than their typically developing peers (Coakley, Holmbeck, Friedman, Greenley, & Thill, 2002).

Finally, within this investigation, only global indices of parental and familial functioning were used, rather than illness-specific indices. It may be that illness-specific variables are more likely to influence changes in parenting behavior among parents of chronically ill children, as compared to the more general family and individual processes investigated in this study. For example, the extent to which a child is able to successfully adhere to his or her medical regimen or perform basic self-care tasks and function independently may have implications for the degree to which parents are willing or able to grant greater behavioral independence and reduce their level of monitoring. In addition, family conflict over medical issues or parental stress related to medical issues may play larger roles in impacting parenting than the more general family or parental processes assessed here.

Despite these limitations, several clinical implications may be drawn from this study. First, rather than relying on short term reports of family or parental functioning in determining targets for intervention, clinicians would be wise to evaluate patterns of parent–child interaction over time with repeated assessments, as individual or family functioning at any one point in time may not be reflective of enduring patterns of behavioral or relational functioning. Moreover, when treating preadolescents and their parents, consideration of the developmental context in which a given behavior occurs is an important task for clinicians. For example, although the presence of parent–child conflict may have negative implications at some developmental stages, short-term increases in conflict may be developmentally necessary to promote a restructuring of the parent–child relationship during the adolescent transition. When conflict endures for a long period of time there may be a risk of negative outcomes, regardless of developmental stage. Such chronic conflict could be a target for clinical intervention.

As indicated by past research, both mothers and fathers of children with SB tend to display higher levels of psychological control and overprotection (Holmbeck, Shapera et al., 2002). Findings of this investigation suggest that decreasing the stressors associated with parenting, particularly for fathers, may be an effective means of promoting more adaptive changes in parenting behaviors over time. As suggested by past research on parenting of able-bodied adolescents, reductions in parental control over time, coupled with consistency in high levels of acceptance are associated with positive adolescent psychosocial adjustment and facilitate autonomy development (Barber & Harmon, 2002; Baumrind, 1991a; Steinberg et al., 1994). Given that the same developmental tasks apply to adolescents with SB, reducing parental stress may indirectly promote more adaptive psychosocial functioning among adolescent offspring. Because children with SB tend to have less social contact than

their able-bodied counterparts (Blum, Resnick, Nelson, & St. Germaine, 1991) and are more reliant on parents, parenting behaviors may be more highly associated with adjustment outcomes than among typically developing youth. As such, it may be particularly important to identify predictors of parenting behaviors among this population as a target for intervention. Future research that addresses the relationship between adaptive parenting changes during the adolescent transition and later adolescent psychosocial functioning is clearly needed.

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