Longitudinal Relationships between Early Adolescent Family Functioning and Youth Adjustment: An Examination of the Moderating Role of Very Low Birth Weight

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Objective To examine longitudinal relations between early adolescent family conflict and late adolescent psychosocial adjustment, and the moderating role of low birth weight. **Methods** Three groups of adolescents (48 with birth weight <750 g, 46 with birth weight 750–1499 g, and 51 term-born controls) and their parents completed ratings of family conflict at age 11 (Time 1). Parent, teacher, and youth reports of psychosocial functioning were obtained at ages 11 and 17 (Time 2). **Results** Birth weight moderated the relationship between Time 1 adolescent-perceived conflict and change in adolescent behavioral functioning. For adolescents with histories of <750 g birth weight, adolescent-perceived conflict predicted less adaptive changes in teacher-reported total behavior problems and externalizing problems. **Conclusions** Small disruptions to the parent–child relationship have negative implications for the later well-being of adolescents with extreme levels of low birth weight. Clinical attention to resolving early adolescent conflict may promote adaptive adjustment.

Key words adolescence; low birth weight; perceived conflict; psychological adjustment.

Improvements in perinatal care in recent years have lead to the increased survival of children with very low birth weight (VLBW, <1500 g), and survival increases have been most evident among infants with <750 g birth weight (Fanaroff, Hack, & Walsh, 2003; Hack & Fanaroff, 1999). Past research has supported a relationship between low-birth-weight status and enduring child developmental, cognitive, and behavioral problems, as well as higher levels of family distress and burden across childhood and early adolescence (Moore, Taylor, Klein, Minich, & Hack, 2005; Taylor, Klein, & Hack, 2000). This research supports a gradient effect hypothesis, with the risk for negative outcomes increasing with decreasing birth weight (Taylor et al., 2000). For families of children with histories of VLBW, the normative developmental changes associated with adolescence may be particularly challenging to manage, given that the biological, cognitive, neurological, and psychosocial problems associated with VLBW pose greater burden on families, which may negatively affect family functioning. Impaired family functioning, in turn, may have implications for adolescent adjustment (Bhutta, Cleves, Casey, Cradock, & Anand, 2002; Botting, Powls, Cooke, & Marlow, 1997; Whitker et al., 1997).

While some recent work has targeted adolescents and young adults with VLBW, the majority of this research has been descriptive in nature and has focused on the persistence of negative neurodevelopmental outcomes and diminished educational achievement into late adolescence and young adulthood (Hack et al., 2002; Pharoah, Stevenson, & West, 2003). Although less research has described the emotional and behavioral functioning of adolescents and young adults with histories of VLBW, findings support the presence of negative emotional and behavioral sequelae in this age group. Several authors have documented higher rates of attention and thought problems (Hack et al., 2004; Saigal, Pinelli, Hoult, Kim, & Boyle, 2003), as well as

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more depressive symptoms (Hack et al., 2004; Patton, Coffey, Carlin, Olsson, & Morley, 2004; Saigal et al., 2003) among adolescents and young adults with histories of VLBW in comparison with their term-born counterparts, even after adjusting for socioeconomic status (SES) and intelligence (Hack et al., 2004). Although at risk for negative behavioral and emotional outcomes in certain areas, not all domains of functioning appear adversely affected. Specifically, Hack et al. (2004) documented that for young adult males and females, VLBW was associated with less self-reported delinquent behavior and lower scores on indices of excessive alcohol use. Similarly, Tideman, Ley, Bjerre, & Forslund (2001) found no differences between adolescents with VLBW and term-born adolescents with respect to self-reported self esteem and quality of life.

Epidemiological research has also suggested an association between perinatal and early childhood risk factors often seen in youth with VLBW and negative adult psychiatric outcomes such as thought disorders (Cannon, Jones, & Murray, 2002; Jones, Rantakallio, Hartikainen, Isohanni, & Sipila, 1988) or mood disorders (Brown, van Os, Driessens, Hoek, & Susser, 2000; Buka & Fan, 1999). Although not unique to this group, identified perinatal risks include reduced gestational age, small head circumference, and oxygen deprivation, whereas established early childhood risk factors include cognitive delay, neurological problems, and chronic illness.

While it is useful to identify perinatal and early childhood risk factors for negative outcomes in adolescence and young adulthood, many previously identified risk factors (e.g., cognitive delay and neurological impairment) are not modifiable. Thus, one goal of this study was to examine familial influences on adjustment among adolescents with histories of VLBW as a means of identifying modifiable factors affecting psychological adjustment in this population.

The importance of family functioning on adolescent development has been repeatedly noted in the developmental literature. Several authors have emphasized that a successful transition into adolescence has implications for later adolescent adjustment (Holmbeck, Paikoff, & Brooks-Gunn, 1995; Steinberg, 1990) and that ongoing disruptions to the parent–child relationship (i.e., conflict) during early adolescence is a risk factor for poorer later adolescent adjustment. Among samples of typically developing adolescents, family relationships that are characterized by high levels of conflict or parental criticism and low levels of support have been associated with negative adjustment outcomes including adolescent depressive symptoms, substance use, and affiliation with deviant peers (Brody & Forehand, 1993; Sheeber, Hops, Alpert, Davis, & Andrews, 1997; Wamboldt & Wamboldt, 2000). A smaller body of research has examined relationships between family functioning and psychological adjustment in those with chronic medical conditions including youth with histories of VLBW. These results generally parallel those documented within healthy populations. Findings indicate that high levels of positive parental involvement and low levels of family conflict are associated with both concurrent and longitudinal positive adjustment outcomes across a variety of pediatric conditions (Dossetor, Nicol, Stretch, & Rajkhowa, 1994; Hauser et al., 1990; Hodes, Rose, & Schwartz Garralda, 1999; Jacobson et al., 1994; Wade et al., 2003).

Research indicates increased family burden and stress during middle childhood and early adolescence among families of children with VLBW compared with families of term-born children (Taylor, Klein, Minich, & Hack, 2001), and difficulties with family functioning persist over time (Moore et al., 2005). Disruptions to family functioning may have a greater negative impact on children with VLBW than on their term-born peers because youth in the former group have poorer social skills (Whitfield, Grunau, & Holsti, 1997) and may have less peer support than their term-born peers. Additionally, adolescents with VLBW may be more dependent on their parents (Cooke, 2004; Hack et al., 2002), making them more vulnerable to a lack of parent support (Bradley, Whiteside, Mundfrom, & Blevins-Knabe, 1995). Thus, the relationship between family dysfunction and adolescent adjustment may be stronger for youth with VLBW than for their typically developing peers.

The primary aim of this study is to expand extant research on the longitudinal relationship between early adolescent family conflict and later adjustment difficulties, by investigating this relationship in samples of varying biological risk, namely, adolescents with VLBW and term-born controls. An examination of longitudinal relationships between family conflict and adjustment is important, as longitudinal studies provide more convincing support for possible causal associations between variables. Moreover, longitudinal studies allow one to identify factors earlier in children's lives that predict later problems, thereby suggesting avenues for preventive interventions.

We expected that higher levels of family conflict in early adolescence (Time 1; T1) would predict more

negative adolescent outcomes longitudinally in the domains of total behavior problems, externalizing symptoms, and internalizing symptoms. In view of the aforementioned physical, cognitive, and psychosocial impairments of children with VLBW, we expected that these adolescents would be more vulnerable than the term-born comparison group to negative family influences on adjustment (i.e., family conflict). Thus, we expected birth-weight status to moderate the association between family conflict at T1 and total behavior problems, externalizing symptoms, and internalizing symptoms at Time 2 (T2), such that conflict would be more detrimental for adolescents at greater biological risk (i.e., those with VLBW) than for those at lower risk (i.e., term-born controls). To determine if the effect varied depending upon the degree of low birth weight, we examined outcomes for two VLBW groups: a higher-risk <750 g birth weight group and a moderate risk 750–1499 g birth weight group.

Method

Participants

Participants included 145 adolescents with varying degrees of birth weight and their parents who were part of a larger longitudinal study of early school-age outcomes of VLBW (Hack et al., 1994). The original cohort included 198 children in one of three groups: birth weight <750 g (93% of all survivors born at neonatal intensive care units in a Midwest region from July, 1982 through December, 1986), birth weight 750–1499 g (nextborn children from the same hospitals and of the same sex and race as the <750 g group children), and term-born controls (children from the same schools as children in the <750 g group, matched for sex, race, and birth date within 3 months). Use of these recruitment strategies yielded comparison groups that were frequency-matched on demographic factors with the <750 g group at the initial data collection point (Taylor et al., 2000).

As a part of the larger study, children were recruited at age 7 years, participated in yearly follow-up assessments between ages 11 and 14 years, and were evaluated for a final time at age 17 years (Taylor et al., 2000). In the present study, data from the mean age 11 years (T1) and mean age 17 years (T2) time points were used. Demographic data at T1 included youth age, race, and sex. Parents also provided information about their levels of education and occupational status, which were used to compute a rating of SES as defined by the Hollingshead Four Factor Index (Hollingshead, 1975). In the current analyses, mother and father reports of SES were combined to form a z score, with higher scores reflecting higher SES. A comparison of families who did not have data available at T1 and T2 ($n = 53$) with those retained at T2 ($n = 145$) failed to reveal differences in child sex, race, SES, levels of either T1 parent or youth-reported family conflict, or T1 parent reports of youth total behavior problems. Table I summarizes group characteristics for the families included in this study, including 48 adolescents in the <750 g group (67% female), 46 adolescents in the 750–1499 g group (67% female), and 51 term-born adolescents (63% female). In the present study, the mean ages at T1 and T2, respectively, were 11.17 and 16.81 years. The higher percentage of females relative to males reflected higher survival rates of females with VLBW.

Procedure

Data for this study were drawn from two time points of a larger longitudinal investigation (Taylor et al., 2000). The study was approved by the institutional review board and written informed consent and assent given by parents and children, respectively. At T1 and T2, parents and youth completed measures of family functioning and adolescent emotional and behavioral functioning. Teacher reports of youth adjustment were also solicited at T1 and T2.

Measures

Family Conflict

At T1, parents and children completed the Conflict Behavior Questionnaire (CBQ; Robin & Foster, 1989), a 20-item yes/no index of family conflict. The total conflict score was used as an index of conflict, with higher scores reflecting higher conflict. The CBQ evidenced adequate reliability for both the parent ($\alpha = .86$) and child ($\alpha = .83$) versions, and parent and youth reports of conflict were modestly correlated ($r = .24$, $p = .002$).

Adolescent Psychological Functioning

Adolescent total behavior problems were assessed at T1 and T2 using the Total Behavior Problems T scores from the parent-reported Child Behavior Checklist (CBCL) and the Teacher Report Form (TRF) (Achenbach, 1991). Adolescent externalizing symptoms were measured at T1 and T2 using the CBCL and TRF externalizing T scores. Adolescent internalizing symptoms were measured at both time points using the CBCL, the TRF internalizing T scores, and the adolescent-reported Children's Depression Inventory (CDI; Kovacs, 1985) total T score. In all cases, higher scores indicated more symptoms.

Table I. Sample Demographics and Neonatal Characteristics

Demographic variable	Group 1 <750 g	Group 2 750–1499 g	Group 3 Term-born	Statistical test
Youth age at T1 *M* (*SD*)	11.20 (1.50)	11.08 (1.33)	11.22 (1.23)	$F(2, 142) = .15$
Youth age at T2 *M* (*SD*)	16.83 (1.21)	16.68 (1.12)	16.93 (1.25)	$F(2, 142) = .50$
Family SES[a] at T1 *M* (*SD*)	.10 (.93)	−.05 (1.07)	.11 (.98)	$F(2, 142) = .40$
Child sex				$\chi^2 = .27$
% Male (*n*)	33 (16)	33 (15)	37 (19)	
% Female (*n*)	67 (32)	67 (31)	63 (32)	
Child ethnicity				$\chi^2 = 1.96$
% White (*n*)	52 (25)	41 (19)	55 (28)	
% Non-white (*n*)	48 (23)	59 (27)	45 (23)	
T1 IQ estimate[b]	80.06 (19.10)	89.72 (18.95)	98.35 (19.45)	$F(2, 142) = 11.25$*
Birth weight (in grams) *M* (*SD*)	660.25 (72.75)	1169.00 (215.06)	–	$t = -15.49$**
Gestational age (in weeks) *M* (*SD*)	25.81 (1.79)	29.41 (2.38)	–	$t = -8.30$**
% Chronic lung disease[c] (*n*)	38 (18)	9 (4)	–	$\chi^2 = 11.28$***
% Ultrasound abnormalities[d] (*n*)	25 (12)	20 (8)	–	$\chi^2 = .37$

[a]SES = socioeconomic status *z* score.
[b]IQ estimate = WISC standard score ($M = 100$).
[c]Defined as oxygen dependence for at least 36 weeks corrected age.
[d]Defined as grade III/IV intraventricular hemorrhage, periventricular leukomalacia, or ventricular dilatation on neonatal cranial ultrasound.
*$p < .001$, Group 1 < Group 2, Group 3.
**$p < .001$, Group 1 < Group 2.
***$p < .01$.

Past research has documented adequate reliability for all measures (Achenbach, 1991; Kovacs, 1985).

Means, *SDs*, and ranges for the measures of conflict and behavior are presented in Table II. Analyses of variance failed to reveal any significant group effects for measures of conflict or behavior at T1 or T2.

Analytic Plan

Regression analyses were conducted to investigate longitudinal associations between T1 family conflict and T2 adolescent adjustment, controlling for T1 adjustment. Factors in the analyses were family conflict, group contrast (represented by two dummy coded variables: <750 g vs. Term, and 750–1499 g vs. Term), sex, SES, and ethnicity. The inclusion of demographic covariates was justified based on past research indicating that male gender, racial minority status, and low SES are risk factors for poorer behavior outcomes (Moore et al., 2005; Thompson et al., 1997). Two-way interactions between family conflict and birth-weight group were included to examine the moderating effects of birth weight on the association between family conflict and youth adjustment. To probe significant interaction effects, the SAS 9.1.3 Software general linear model procedure was used to evaluate whether simple slopes differed from zero and from each other. As an adjustment for multiple comparisons, we differentiated between primary (i.e., total behavior problems) and secondary outcomes (internalizing and externalizing symptoms), and applied a Bonferroni correction to analyses of secondary outcomes.

Results

Associations of Adolescent-perceived Family Conflict at T1 with Adolescent Adjustment at T2

Results failed to support main effects of T1 adolescent-perceived family conflict on residualized change in parent-, teacher-, or youth-reported psychosocial functioning (see Table III).

Associations of Parent-perceived Family Conflict at T1 with Adolescent Adjustment at T2

Table IV presents multiple regression findings related to parent-perceived family conflict. Analyses revealed no main effects of T1 parent-perceived family conflict on residualized change in parent-, teacher-, or youth-reported psychosocial functioning.

Moderating Effects of Birth-weight Group

Longitudinal analyses offered partial support for the moderating role of birth-weight group. Interactions between T1 adolescent-perceived family conflict and <750 g status were documented for residualized change in the teacher report of total behavior problems ($\beta = .43$, $t = 2.34$, $p = .02$; Fig. 1) and total externalizing problems ($\beta = .49$, $t = 2.85$, $p = .01$). Additionally, there

Table II. Means and *SDs* for Total Sample and Subsamples[a]

	Total sample $N=145$		<750 g group $n=48$		750–1499 g group $n=46$		Term-born group $n=51$	
	M (*SD*)	Range	*M* (*SD*)	Range	*M* (*SD*)	Range	*M* (*SD*)	Range
T1 child CBQ	3.32 (3.61)	0–17	3.39 (3.02)	0–11	3.37 (3.74)	0–15	3.20 (4.02)	0–17
T1 parent CBQ	3.39 (3.68)	0–17	3.81 (4.58)	0–17	2.83 (2.44)	0–10	3.46 (3.62)	0–12
T1 CBCL total	49.31 (11.54)	26–78	52.08 (12.13)	29–74	47.76 (9.97)	26–68	48.06 (12.00)	26–78
T2 CBCL total	45.99 (12.61)	23–82	48.68 (12.04)	24–81	45.29 (10.49)	24–67	44.08 (14.55)	23–82
T1 CBCL internalizing	49.84 (10.69)	31–83	52.02 (10.34)	33–74	47.78 (9.77)	31–70	49.61 (11.56)	32–83
T2 CBCL internalizing	47.95 (11.49)	31–90	50.47 (10.81)	31–90	47.18 (9.84)	31–70	46.28 (13.19)	31–85
T1 CBCL externalizing	47.99 (10.40)	30–78	48.90 (11.05)	32–69	46.84 (8.22)	32–65	48.14 (11.54)	30–78
T2 CBCL externalizing	45.97 (10.73)	32–87	45.96 (10.11)	32–67	46.24 (9.80)	32–64	45.74 (12.20)	32–87
T1 TRF total	51.96 (8.99)	32–72	53.91 (9.05)	32–72	51.23 (9.14)	32–69	50.72 (8.63)	32–69
T2 TRF total	48.70 (9.50)	33–73	50.11 (9.54)	33–70	49.03 (9.14)	33–65	47.00 (9.76)	33–73
T1 TRF internalizing	51.93 (8.63)	36–73	53.50 (8.68)	37–73	51.05 (8.52)	36–68	51.23 (8.66)	36–69
T2 TRF internalizing	48.82 (8.85)	38–72	50.43 (9.75)	38–72	48.76 (8.31)	38–71	47.26 (8.30)	38–66
T1 TRF externalizing	50.91 (8.50)	39–78	51.41 (8.82)	39–73	50.93 (8.85)	39–78	50.40 (7.98)	39–70
T2 TRF externalizing	48.23 (8.12)	40–69	48.43 (8.15)	40–67	48.59 (7.90)	40–65	47.74 (8.48)	40–69
T1 CDI	46.13 (7.83)	35–77	47.20 (9.36)	35–77	46.67 (7.93)	35–71	44.63 (5.85)	37–58
T2 CDI	42.25 (7.17)	34–78	42.95 (6.28)	34–66	41.68 (8.45)	34–78	42.11 (6.75)	34–65

[a]Analyses of variance failedto reveal any significant group effects.

CBCL, child behavior checklist; CBQ, conflict behavior questionnaire; CDI, children's depression inventory; TRF, teacher report form.

was a trend for birth-weight group to moderate associations between adolescent-perceived conflict and residualized change in teacher-reported total internalizing problems ($\beta = .41$, $t = 2.26$, $p = .03$).

Post hoc probing of the interactions indicated that for <750 g group, increasing adolescent-perceived conflict was associated with significant increases in total behavior problems (<750 g slope vs. 0: $\beta = 1.93$, $t = 3.04$, $p = 0.00$) and externalizing problems (<750 g slope vs. 0: $\beta = 1.72$, $t = 3.51$, $p = 0.00$). In contrast, the psychosocial functioning of the 750–1499 g and Term groups did not differ as a function of changes in levels of family conflict TRF total behavior problems (750–1499 g slope vs. 0 $\beta = .04$, $t = .06$, $p = .95$; Term slope vs. 0 $\beta = .15$, $t = .34$, $p = .74$) and TRF externalizing problems: 750–1499 g slope vs. 0 $\beta = .19$, $t = .41$, $p = .69$; Term slope vs. 0 $\beta = .04$, $t = .13$, $p = .90$).

Additionally, the behavioral functioning of the <750 g group was significantly more negatively affected by increasing adolescent-perceived family conflict than was the functioning of either of the other groups. This was true across both domains of teacher-reported functioning, including total behavior problems (<750 g vs. Term slopes: $\beta = 1.78$, $t = 2.34$, $p = .02$; <750 g vs. 750–1499 g slopes: $\beta = 1.90$, $t = 2.24$, $p = .03$) and total externalizing problems (<750 g vs. Term slopes: $\beta = 1.68$, $t = 2.85$, $p = .01$; <750 g vs. VLBW slopes: $\beta = 1.53$, $t = 2.32$, $p = .02$).

The impact of adolescent-perceived family conflict on behavioral functioning did not differ between the 750–1499 g and Term groups (TRF total behavior problems: 750–1499 g vs. Term: $\beta = -.12$, $t = -.16$, $p = .87$; TRF externalizing problems 750–1499 g vs. Term: $\beta = .14$, $t = .26$, $p = .80$). Interactions between parent-perceived conflict and birth-weight group did not reach significance (Table IV).

Thus, partial support was obtained for the hypothesis that birth-weight status would moderate the relationship between early adolescent family conflict and later adolescent adjustment. Higher adolescent-perceived conflict was associated with more negative changes in total behavioral functioning and externalizing symptoms for the <750 g group. No support for a relationship between perceived conflict and adjustment was documented for the other groups. Analyses also failed to confirm the hypothesis that birth weight would moderate the relationship between conflict and adjustment with parent perceptions of family conflict as the independent variable.

Secondary Analyses

To examine if our results were unduly influenced by a lack of understanding of self-report questionnaires among those with cognitive delays, we repeated the above analyses with a subsample of participants whose Full Scale IQs were 70 or higher ($n = 116$). Findings with this reduced sample paralleled the findings obtained with

Table III. Results of Longitudinal Hierarchical Regression Analyses with Youth-reported Family Conflict ($N = 145$)

Variable	B	SE B	β	r^2
T2 CBCL total behavior problems				
T1 CBCL total	.65	.08	.61***	
SES	−1.25	.97	−.10	
Child sex	−1.09	1.76	−.04	
Child race	.93	1.92	.04	
<750 g vs. Term contrast	−.15	2.78	−.01	
750–1499 g vs. Term contrast	1.15	2.63	.04	
Youth CBQ	.21	.34	.06	
<750 g vs. Term × youth CBQ	.38	.59	.07	
750–1499 g vs. Term × youth CBQ	.01	.52	.00	
				.48***
T2 CBCL total externalizing T scores				
T1 CBCL total externalizing	.59	.08	.58***	
SES	−1.68	.87	−.16	
Child sex	−1.30	1.55	−.06	
Child race	−.29	1.70	−.01	
<750 g vs. Term contrast	−.39	2.45	−.02	
750–1499 g vs. Term contrast	1.99	2.31	.09	
Youth CBQ	.42	.30	.14	
<750 g vs. Term × youth CBQ	−.11	.52	−.02	
750–1499 g vs. Term × youth CBQ	−.25	.46	−.06	
				.46***
T2 CBCL total internalizing T scores				
T1 CBCL total internalizing	.62	.08	.59***	
SES	−1.22	.92	−.11	
Child sex	.23	1.69	.01	
Child race	1.63	1.85	.07	
<750 g vs. Term contrast	.14	2.68	.01	
750–1499 g vs. Term contrast	.89	2.52	.04	
Youth CBQ	−.02	.33	−.01	
<750 g vs. Term × youth CBQ	.45	.56	.10	
750–1499 g vs. Term × youth CBQ	.15	.51	.03	
				.42***
T2 TRF total behavior problems				
T1 TRF total behavior problems	.05	.13	.05	
SES	−.30	1.25	−.03	
Child sex	−.74	2.31	−.04	
Child race	1.47	2.55	.07	
<750 g vs. Term contrast	−3.02	3.28	−.15	
750–1499 g vs. Term contrast	2.78	3.40	.13	
Youth CBQ	.15	.45	.05	
< 750 g vs. Term × youth CBQ	1.78	.76	.43*	
750–1499 g vs. Term × youth CBQ	−.12	.72	−.03	
				.18
T2 TRF total externalizing problems				
T1 TRF total externalizing	.12	.11	.12	
SES	−1.20	.97	−.14	
Child sex	−2.50	1.78	−.15	
Child race	2.29	2.04	.14	
<750 g vs. Term contrast	−4.89	2.54	−.29	
750–1499 g vs. Term contrast	1.03	2.63	.06	
Youth CBQ	.04	.35	.02	
<750 g vs. Term × youth CBQ	1.68	.59	.49**	
750–1499 g vs. Term × youth CBQ	.14	.56	.04	
				.30**
T2 TRF total internalizing problems				
T1 TRF total internalizing	.06	.11	.06	
SES	.58	1.14	.06	
Child sex	.03	2.08	.00	
Child race	−1.57	2.32	−.09	
<750 g vs. Term contrast	−1.81	3.00	−.10	
750–1499 g vs. Term contrast	1.72	3.10	.09	
Youth CBQ	.21	.41	.08	
<750 g vs. Term × youth CBQ	1.54	.68	.41*	
750–1499 g vs. Term × youth CBQ	.02	.66	.01	
				.16
T2 CDI				
T1 CDI	.13	.11	.15	
SES	.12	.86	.02	
Child sex	−1.49	1.61	−.10	
Child race	1.21	1.77	.08	
<750 g vs. Term contrast	−2.71	2.45	−.18	
750–1499 g vs. Term contrast	1.77	2.27	.11	
Youth CBQ	.09	.34	.04	
<750 g vs. Term × youth CBQ	.69	.56	.22	
750–1499 g vs. Term × youth CBQ	−.79	.47	−.29	
				.11

*$p < .05$, **$p < .01$, ***$p < .001$.
CBCL, child behavior checklist; CBQ, conflict behavior questionnaire; CDI, children's depression inventory; TRF, teacher report form.

the larger sample. For the <750 g group, increasing adolescent-perceived conflict was associated with less adaptive changes in emotional and behavioral functioning. In contrast, the psychosocial functioning of the 750–1499 g and Term groups did not differ as a function of changes in levels of family conflict. Specifically, interactions between T1 adolescent-perceived family conflict and <750 g status were documented for residualized change in teacher report of total internalizing problems ($\beta = .46$, $t = 2.45$, $p = .02$) and parent report of total internalizing problems ($\beta = .28$, $t = 2.55$, $p = .01$). The interaction between T1 adolescent-perceived family conflict and <750 g status in the prediction of teacher-reported total behavior problems was reduced to a trend ($\beta = .36$, $t = 1.90$, $p = .06$), while the interaction between T1 adolescent-perceived conflict and teacher-reported externalizing symptoms dropped to nonsignificance ($\beta = .18$, $t = .97$, $p = .33$).

Discussion

The current investigation utilized a longitudinal approach to examine the relationship between parent and

Table IV. Results of Longitudinal Hierarchical Regression Analyses with Parent-reported Family Conflict ($N = 145$)

Variable	B	SE B	β	r^2
T2 CBCL total behavior problems				
T1 CBCL total	.59	.09	.55***	
SES	−1.01	.99	−.08	
Child sex	−.18	1.72	−.01	
Child race	1.39	1.90	.06	
<750 g vs. Term contrast	2.63	2.68	.10	
750–1499 g vs. Term contrast	3.86	3.02	.14	
Parent CBQ	.65	.43	.19	
<750 g vs. Term × parent CBQ	−.20	.49	−.05	
750–1499 g vs. Term × parent CBQ	−.10	.73	−.15	
				.47***
T2 CBCL total externalizing T scores				
T1 CBCL total externalizing	.47	.09	.46***	
SES	−1.50	.87	−.14	
Child sex	−.69	1.50	−.03	
Child race	.63	1.66	.03	
<750 g vs. Term contrast	.19	2.30	.01	
750–1499 g vs. Term contrast	2.30	2.62	.10	
Parent CBQ	.71	.38	.24	
<750 g vs. Term × parent CBQ	−.14	.43	−.04	
750–1499 g vs. Term × parent CBQ	−.46	.63	−.08	
				.45***
T2 CBCL total internalizing T scores				
T1 CBCL total internalizing	.61	.08	.58***	
SES	−1.13	.92	−.10	
Child sex	.90	1.62	.04	
Child race	1.39	1.78	.06	
<750 g vs. Term contrast	2.17	2.50	.09	
750–1499 g vs. Term contrast	4.92	2.83	.20	
Parent CBQ	.22	.39	.07	
<750 g vs. Term × parent CBQ	.06	.46	.02	
750–1499 g vs. Term × parent CBQ	−1.30	.68	−.22	
				.43***
T2 TRF total behavior problems				
T1 TRF Total behavior problems	.15	.13	.14	
SES	−.85	1.32	−.08	
Child sex	.95	2.25	.05	
Child race	1.71	2.47	.09	
<750 g vs. Term contrast	−.31	3.14	−.02	
750–1499 g vs. Term contrast	.60	3.84	.03	
Parent CBQ	−.26	.52	−.09	
<750 g vs. Term × parent CBQ	.86	.66	.26	
750–1499 g vs. Term × parent CBQ	.47	.96	.09	
				.12
T2 TRF total externalizing problems				
T1 TRF total externalizing	.20	.12	.21	
SES	−1.71	1.06	−.20	
Child sex	−.95	1.81	−.06	
Child race	1.95	2.08	.12	
<750 g vs. Term contrast	.38	2.52	.02	
750–1499 g vs. Term contrast	.71	3.10	.04	
Parent CBQ	.17	.42	.07	
<750 g vs. Term × parent CBQ	.10	.54	.04	
750–1499 g vs. Term × parent CBQ	.02	.77	.01	
				.19*
T2 TRF total internalizing problems				
T1 TRF total internalizing	.10	.11	.10	
SES	−.17	1.18	−.02	
Child sex	2.34	2.01	.13	
Child race	−1.55	2.25	−.09	
<750 g vs. Term contrast	−.66	2.87	−.04	
750–1499 g vs. Term contrast	−2.06	3.50	−.11	
Parent CBQ	−.50	.48	−.20	
<750 g vs. Term × parent CBQ	1.10	.60	.36	
750–1499 g vs. Term × parent CBQ	1.05	.87	.22	
				.12
T2 CDI				
T1 CDI	.13	.09	.14	
SES	.37	.85	.05	
Child sex	−1.44	1.51	−.09	
Child race	1.06	1.70	.07	
<750 g vs. Term contrast	.52	2.26	.03	
750–1499 g vs. Term contrast	−3.37	2.70	−.22	
Parent CBQ	.62	.33	.32	
<750 g vs. Term × parent CBQ	−.23	.41	−.11	
750–1499 g vs. Term × parent CBQ	.97	.65	.25	
				.16*

*$p < .05$, ***$p < .001$.
CBCL, child behavior checklist; CBQ, conflict behavior questionnaire; CDI, children's depression inventory; TRF, teacher report form.

adolescent perceptions of early adolescent family conflict and changes in youth's emotional and behavioral functioning during adolescence. The use of a longitudinal design afforded the opportunity to examine precursors to later adjustment difficulties in a population at risk for higher levels of emotional and behavioral dysfunction (Hack et al., 2004), and to account for baseline levels of adjustment within our sample. Additional contributions of the present investigation included the use of multiple reporting perspectives for family conflict and adolescent adjustment, as well as consideration of family conflict, which is a modifiable antecedent of late adolescent adjustment problems. The current study extended the available body of research on the detrimental impact of perceived family conflict on adolescent adjustment by focusing on a population of youth with varying degrees of biological risk (i.e., those with and without histories of VLBW).

We expected that the relationship between early adolescent family conflict and later psychological adjustment would be strongest for youth with <750 g birth

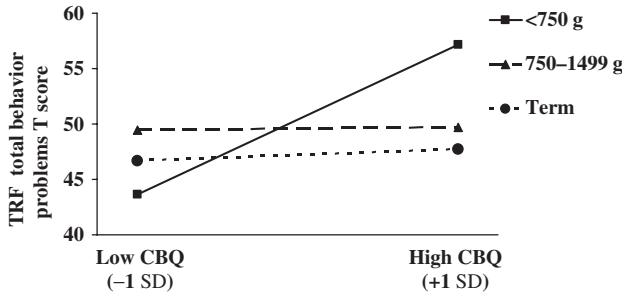

Figure 1. Youth-reported conflict by birth weight group interaction for teacher-reported total behavior problems. A similar pattern of findings emerged with teacher-reported total externalizing problems T score as the dependent variable and with teacher-reported total internalizing problems T score as the dependent variable.

weight given the biological risk associated with higher rates of neurological and cognitive impairments in this group relative to the 750–1499 g and Term groups (Taylor et al., 2000). Additionally, because adolescents with VLBW have more social impairments (Whitfield et al., 1997) and may be more reliant on parents for support than the other groups, we expected that disruptions to the parent–child relationship (i.e., conflict) would have a more negative impact on their adjustment. For adolescents with the greatest biological risk (i.e., those in the <750 g group), adolescent-perceived conflict was predictive of later adjustment difficulties, suggesting that for this group, even small disruptions to the parent–child relationship have negative implications for later adolescent well being. This pattern of findings held even when our sample was limited to those without significant cognitive deficits, and offered partial support for our hypothesis. The findings are consistent with developmental theory in indicating that disruptions to the early adolescent parent–child relationship (in the form of adolescent-perceived conflict) have negative implications for later adolescent adjustment (Holmbeck et al., 1995; Steinberg, 1990). Moreover, these findings are consistent with past research documenting negative outcomes of family conflict for adolescent adjustment in populations of both chronically ill (Dossetor et al., 1994; Wade et al., 2003) and healthy youth (Brody & Forehand, 1993; Sheeber et al., 1997; Wamboldt & Wamboldt, 2000).

Although adolescent-perceived family conflict was predictive of adjustment difficulties among adolescents with histories of extreme VLBW, no relationship between perceived family conflict and adolescent adjustment difficulties was documented in either the 750–1499 g or the Term group. It may be that the low to moderate levels of family conflict reported by families in the present investigation had little negative impact on the functioning of adolescents with low levels of biological risk. For these lower risk groups, psychosocial functioning may be adversely affected only under conditions of more severe conflict.

This study has several limitations that can be addressed in future research. First, we assessed only perceived family conflict. Future research that incorporates both self-reported and observational assessments of conflict would help to clarify if perceptions of conflict or objective levels of conflict differentially predict adolescent adjustment. Moreover, our findings suggested that adolescent, but not parent, perceptions of conflict were associated with negative outcomes among youth in the <750 g group. It may be that adolescent perceptions (i.e., the way in which the adolescent internalizes parent–child interactions) are more important in predicting adjustment than is the objective level of conflict within the family. In other words, parent report may have been less useful as a predictor because parents are not necessarily privy to adolescent internal states, and because parents and adolescents may not interpret behavioral exchanges within the family in the same manner. Thus, what is internalized as conflict and distressing to an adolescent may not be the same as what the parent perceives as conflict. Additionally, in the current study we utilized a brief conflict scale that did not allow for an examination of different types of conflict. Future research that examines if specific subtypes of conflict have a differential impact on adolescent adjustment would help to clarify whether all conflict is detrimental or if certain subtypes of conflict are particularly harmful to adolescent psychosocial functioning. Because youth with VLBW are more reliant on parent support, a comprehensive understanding of the impact of disruptions to the parent–child relationship could aid intervention efforts with this group. In addition, we examined only selected domains of adolescent adjustment (e.g., behavioral and emotional functioning). Future research is needed to examine additional domains of adolescent adjustment (social functioning, quality of life, and parent–child interactions) in order to determine the scope of risk of early adolescent family conflict. Finally, future research that examines potential moderators of the relationship between conflict and adjustment is indicated. This line of research would help identify subgroups of adolescents that are most at risk for adjustment difficulties, as well as provide additional targets for intervention. For example, family conflict resolution skills, the quality of the family relationship, or adolescent social support levels may

buffer against the negative effects of conflict on later adjustment. Since each of these variables is modifiable, each could serve as an additional target for clinical intervention. Future research could also examine the extent to which the impact of early adolescent family conflict on later emotional and behavioral functioning may differ for females versus males.

The clinical implications of these findings are noteworthy. Among adolescents with histories of extreme VLBW, family conflict during early adolescence may be a useful target for clinical intervention, particularly when the conflict is being reported by the adolescent. Focusing clinical efforts on identifying families of youth with extreme VLBW who display even low levels of perceived conflict before adolescence may prevent the development of adjustment problems in an already at-risk group. Moreover, identifying adolescents who are already reporting family conflict during early adolescence and intervening with these families to improve the parent–child relationship may promote more adaptive adolescent functioning over time.

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