Rate and Predictors of Divorce Among Parents of Youths With ADHD

Brian T. Wymbs and William E. Pelham Jr.
University at Buffalo, State University of New York

Elizabeth M. Gnagy
University of Buffalo, State University of New York

Brooke S. G. Molina
University of Pittsburgh

Tracey K. Wilson
University of Pittsburgh Medical Center

Joel B. Greenhouse
Carnegie Mellon University

Numerous studies have asserted the prevalence of marital conflict among families of children with attention-deficit/hyperactivity disorder (ADHD), but evidence is surprisingly less convincing regarding whether parents of youths with ADHD are more at risk for divorce than are parents of children without ADHD. Using survival analyses, the authors compared the rate of marital dissolution between parents of adolescents and young adults with and without ADHD. Results indicated that parents of youths diagnosed with ADHD in childhood (n = 282) were more likely to divorce and had a shorter latency to divorce compared with parents of children without ADHD (n = 206). Among a subset of those families of youths with ADHD, prospective analyses indicated that maternal and paternal education level; paternal antisocial behavior; and child age, race/ethnicity, and oppositional–defiant/conduct problems each uniquely predicted the timing of divorce between parents of youths with ADHD. These data underscore how parent and child variables likely interact to exacerbate marital discord and, ultimately, dissolution among families of children diagnosed with ADHD.

Keywords: ADHD, ODD/CD, antisocial behavior, divorce, marital conflict

Discord between parents of youths with attention-deficit/hyperactivity disorder (ADHD) is not uncommon. Parents of children with ADHD report less marital satisfaction, fight more often, and use fewer positive and more negative verbalizations during child-rearing discussions than do parents of children without ADHD (Barkley, Fischer, Edelbrock, & Smallish, 1991; Jensen, Shervette, Xenakis, & Bain, 1988; Johnston & Behrenz, 1993). Studies also highlight the link between severity of child behavior and interparental discord and report greater discord among parents of youths with ADHD and comorbid oppositional–defiant disorder (ODD) or conduct disorder (CD) than among parents of youths with ADHD alone or without ADHD (Barkley, Anastopoulos, Guevremont, & Fletcher, 1992; Lindahl, 1998; Wymbs, Pelham, Gnagy, & Molina, 2008). Given the stressful nature of parenting children with ADHD (Johnston & Mash, 2001), the common presence of multiple environmental stressors in these families (Counts, Nigg, Stawicki, Rappley, & Von Eye, 2005), and the linkage between these variables and marital conflict (Cummings & Davies, 1994), the elevated rates of interparental discord in families of youths with ADHD are not surprising.

The prevalence and severity of conflict between parents of children with ADHD are of concern, given data suggesting that...
specific conflict resolution tactics predict later divorce. Specifically, couples observed to exhibit elevated levels of maladaptive problem-solving methods are more likely to divorce (Gottman, Coan, Carrere, & Swanson, 1998; Gottman & Levenson, 1992; Rogge & Bradbury, 1999; Rogge, Bradbury, Hahlweg, Engl, & Thurmair, 2006). Heyman and colleagues (Heyman & Hunt, 2007; Heyman & Slep, 2001), conversely, cautioned against over-interpreting findings from divorce prediction studies, given the prevalence of important methodological limitations (e.g., failure to cross-validate prediction equations). Although we acknowledge their concern, this line of research, at a minimum, underscores the potential of highly discordant couples (e.g., parents of children with ADHD) divorcing over time.

Surprisingly, research has not consistently found that divorce rates differ between parents of children and adolescents with and without ADHD. Although several studies revealed a greater prevalence of divorce among families of children and adolescents with ADHD (Barkley, Fischer, Edelbrock, & Smallish, 1990; Brown & Pacini, 1989; Faraone, Biederman, Keenan, & Tsuang, 1991; Jensen et al., 1988), an equal number of studies found no differences (Barkley et al., 1991; McGee, Williams, & Silva, 1984; Minde et al., 2003; Schachar & Wachs, 1991). These conflicting findings likely occurred for two reasons: (a) all but two studies (Barkley et al., 1990, 1991) assessed parents of preadolescents and (b) all studies used a single assessment point. Investigations that include longitudinal data sets with families of children across a wider age range and that examine the probability of divorce over a greater passage of time are needed. Furthermore, because adolescents and young adults (Amato, 2000) as well as young children are negatively affected by divorce, there is a need for studies that compare the prevalence of divorce in families that do or do not contain youths of all ages with ADHD.

Marital relations researchers (e.g., Gottman, 1994) have identified a number of variables that place couples at risk for divorce. Amato and Rogers (1997) conceptualized that contextual factors and proximal interpersonal behaviors predispose couples to engage in marital discord and, ultimately, to divorce. Indeed, both distal characteristics, such as prior marriage and education level (Emery, 1999), and proximal variables, such as depression and substance abuse/dependence (Amato & Rogers, 1997), portend risk of divorce for married couples. Curiously, Amato and Rogers’s model did not account for the potential influence of distal or proximal child factors on risk of divorce. This omission is noteworthy, because proximal disruptive child behavior has been shown to exacerbate proximal adult behavior linked with divorce, including stress and alcohol consumption (Pelham et al., 1997, 1998) and interparental discord (Schermerhorn, Cummings, DeCarlo, & Davies, 2007; Wymbs et al., 2007). Distal child variables (e.g., child age, race/ethnicity, number of offspring) have also been linked with marital dissolution (Emery, 1999). In brief, studies that examine the unique influence of distal/proximal parent and child variables on risk of divorce are sorely needed.

Another proximal parent risk factor particularly relevant for parents of children with externalizing disorders is antisocial behavior (e.g., Lahey et al., 1988). Evidence supports a hereditary link between parental antisocial personality disorder and child ADHD/ODD/CD (Faraone, Biederman, Jetton, & Tsuang, 1997; Piffner, McBurnett, Rathout, & Judice, 2005); such a link may represent a distal variable contributing to the risk of divorce in these families (Emery, Waldron, Kitzmann, & Aaron, 1999; Jockin, McGu, & Lykken, 1996). Because antisocial adults exhibit harmful interpersonal behaviors such as aggression, which is a reliable predictor of divorce potential (Heyman, O’Leary, & Jouriles, 1995) and completion (Rogge & Bradbury, 1999), there is a need for research examining the role that parental antisociality may play in exacerbating marital dissolution in families of children with ADHD.

In this study, we sought to address the aforementioned gaps in the extant literature by (a) comparing the rate of divorce between parents of adolescents and young adults with and without ADHD in childhood and (b) investigating the degree to which empirically/theoretically relevant parent and child characteristics prospectively predict marital dissolution in these families. We hypothesized that parents of youths diagnosed with ADHD in childhood were more likely to have a shorter latency to divorce than were parents of youths without ADHD. On the basis of Amato and Rogers’s (1997) conceptual model of divorce, we expected that distal (level of education, marital history) and proximal (substance abuse, depression, antisocial behavior) parent variables would uniquely predict the rate of divorce in a subset of the families of children with ADHD. Extending their model, we hypothesized that distal (age, race/ethnicity) and proximal (ADHD symptom severity, ODD/CD symptom severity) child factors would uniquely predict the rate of divorce in the context of the distal/proximal parent risk factors.

Method

Participants

Data were gathered from parents of adolescents and young adults with and without ADHD who were participating in the Pittsburgh ADHD Longitudinal Study (PALS; Faden et al., 2004; Molina, Pelham, Gnagy, Thompson, & Marshal, 2007). All adolescents and young adults with ADHD (probands) in PALS were recruited from a pool of 516 adolescents and young adults who had been diagnosed with ADHD as children and who had attended the Summer Treatment Program (STP; Pelham, Fabiano, Gnagy, Greiner, & Hoza, 2005) conducted at the ADD clinic at the Western Psychiatric Institute and Clinic in Pittsburgh, Pennsylvania, between 1987 and 1996. Of the eligible probands, 493 were recontacted and 364 were interviewed (70.5% participation rate) for PALS. Participating probands were compared with nonparticipating probands on demographic variables (e.g., age at first treatment, race/ethnicity, parental education level, and marital status) and diagnostic variables (e.g., parent and teacher ratings of ADHD and related symptomatology). Only 1 of 14 comparisons was significant at the p < .05 level: Participants had a slightly lower average CD symptom rating than did nonparticipants.

Briefly, all probands met diagnostic criteria in childhood for ADHD according to the Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.; DSM–III–R; American Psychiatric Association [APA], 1987; 4th ed.; DSM–IV; APA, 1994). Proband age at initial evaluation ranged from 5.0 to 16.9 years; 90.0% of probands were between the ages of 5 and 12. We collected diagnostic information using several sources, including the parent and teacher Disruptive Behavior Disorders (DBD) Rating Scale (Pelham, Gnagy, Greenslade, & Milich, 1992) and a structured inter-
view consisting of the DSM descriptors for ADHD, ODD, and CD and of situational and severity probes (instrument available at http://wings.buffalo.edu/adhd). Exclusionary criteria included a full scale IQ of less than 80; a history of seizures or other neurological problems; and/or a history of pervasive developmental disorder, schizophrenia, or other psychotic or organic mental disorders.

A group of 240 demographically similar adolescents and young adults without ADHD (controls) and their parents were recruited locally from 1999 to 2001 to participate in PALS. Many of the adolescent controls were recruited through several large pediatric practices (40.8% of control sample) that served patients from diverse socioeconomic backgrounds. The remaining controls, particularly young adults, were recruited via advertisements in local newspapers and the university hospital newsletter (27.5%), local universities and colleges (20.8%), and other methods (e.g., word of mouth). A telephone screening interview administered to parents of potential controls gathered basic demographic characteristics, presence of exclusionary criteria, and a checklist of ADHD symptoms. Individuals who met DSM–III–R criteria for ADHD, either currently or historically, were excluded. Controls were not excluded on the basis of subthreshold ADHD or other psychiatric disorders. Controls were matched as a group to probands on the basis of age (within 1 year), gender, race/ethnicity, and parental disorder. Controls were not excluded from this study for the following reasons: (a) 32 parents of probands and 11 parents of controls were never married during the life of the target child; (b) 40 parents of probands and 16 parents of controls did not complete PALS follow-up measures or refused to participate in this study; and (c) 10 parents of probands and 7 parents of controls were widowed. Eligible and ineligible PALS proband and control families were compared across a number of demographic variables collected at follow-up. Among the 10 demographic variables examined, only 3 variables differed between eligible and ineligible families: paternal level of education, maternal race/ethnicity, and child race/ethnicity. Across proband and control groups (there were no differences across diagnostic status), ineligible families tended to have fathers who reported low education levels and to include more minority parents/children than did those families that were eligible for this study.

Table 1 displays demographic data gathered during the first follow-up visit for PALS proband and control families included in this study. Paternal age and race/ethnicity were not collected at follow-up, because mothers tended to complete the demographics questionnaire and were required to contribute only their own age and race/ethnicity. Paternal education was collected because it was one of the demographic matching variables.

The sample used for the Cox regression analyses was a subset of the ADHD sample whose data are shown in Table 1, because we collected childhood data, used as predictors in these prospective analyses (see below), only from families of probands. Of the 282

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-ADHD (n = 206)</th>
<th>ADHD (n = 282)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, M (SD)</td>
<td>17.07 (3.13)</td>
<td>17.73 (3.32)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>% male</td>
<td>88.8</td>
<td>88.3</td>
<td>.94</td>
</tr>
<tr>
<td>% Caucasian</td>
<td>88.8</td>
<td>85.6</td>
<td>.67</td>
</tr>
<tr>
<td>Years since STP, M (SD)</td>
<td>NA</td>
<td>8.28 (2.64)</td>
<td>N.A.</td>
</tr>
<tr>
<td>ADHD symptoms</td>
<td>0.23 (0.27)</td>
<td>1.22 (0.70)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ODD/CD symptoms</td>
<td>0.32 (0.35)</td>
<td>1.20 (0.78)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Mother’s age, M (SD)</td>
<td>46.26 (5.40)</td>
<td>46.29 (6.09)</td>
<td>.96</td>
</tr>
<tr>
<td>% Caucasian mothers</td>
<td>91.9</td>
<td>90.7</td>
<td>.92</td>
</tr>
<tr>
<td>Years married before birth of child, M (SD)</td>
<td>5.36 (4.01)</td>
<td>4.76 (3.97)</td>
<td>.11</td>
</tr>
<tr>
<td>Maternal level of education, M (SD)*</td>
<td>6.94 (1.86)</td>
<td>6.85 (1.68)</td>
<td>.60</td>
</tr>
<tr>
<td>% high school graduate or GED</td>
<td>16.7</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>% partial college or specialized training</td>
<td>23.2</td>
<td>28.4</td>
<td></td>
</tr>
<tr>
<td>% associate’s or 2-year degree</td>
<td>8.1</td>
<td>14.4</td>
<td></td>
</tr>
<tr>
<td>% college or university graduate</td>
<td>24.7</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>% graduate professional training</td>
<td>27.3</td>
<td>17.8</td>
<td></td>
</tr>
<tr>
<td>Paternal level of education, M (SD)*</td>
<td>6.75 (1.92)</td>
<td>6.07 (2.04)</td>
<td>.01</td>
</tr>
<tr>
<td>% high school graduate or GED</td>
<td>19.9</td>
<td>24.7</td>
<td></td>
</tr>
<tr>
<td>% partial college or specialized training</td>
<td>22.5</td>
<td>25.5</td>
<td></td>
</tr>
<tr>
<td>% associate’s or 2-year degree</td>
<td>7.3</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>% college or university graduate</td>
<td>26.2</td>
<td>13.7</td>
<td></td>
</tr>
<tr>
<td>% graduate professional training</td>
<td>23.0</td>
<td>18.0</td>
<td></td>
</tr>
</tbody>
</table>

Note. Age is in years. Proband diagnostic status was determined in childhood. PALS = Pittsburgh ADHD Longitudinal Study; ADHD = attention-deficit/hyperactivity disorder; STP = Summer Treatment Program; ODD = oppositional–defiant disorder; CD = conduct disorder. *Response scale for level of education ranged from 1 (<7th-grade education) to 9 (Graduate professional training). Other anchors included 4 = High school graduate or GED, 5 = Specialized training, 6 = Partial college, 7 = Associate’s or 2-year degree, and 8 = Standard college or university education.
families of youths with ADHD that provided marital outcome data, 191 (67.7%) had complete data for all child and parent family predictor variables. However, because 44 divorces occurred prior to the gathering of childhood data, prospective Cox regression analyses were possible with only 147 proband families, including 23 families (15.6%) that experienced divorce after baseline data collection.

Procedure

Childhood data were collected for proband families during intake assessments for the STP. As indicated in Table 1, these baseline assessments took place an average of 8 years prior to the first PALS follow-up visit. Several baseline measures were considered potential predictors of divorce in this study (see below).

The PALS follow-up protocol was approved by the University of Pittsburgh Institutional Review Board. After written informed consent had been collected, PALS youths and their parents were interviewed individually by postbaccalaureate research staff. In cases where distance prevented participant travel to WPIC, information was collected through a combination of mailed and telephone correspondence; home visits were offered as need dictated. During the first PALS follow-up assessment, parents provided their marital history and completed measures assessing lifetime major depression, antisocial behavior, and substance abuse (see below).

Measures

Divorce history. During the first PALS follow-up visit, parents (usually mothers) indicated their current marital status and time since their most recent divorce (if applicable). In the event that respondents reported multiple divorces, they were asked to report when they had divorced the biological parent of the adolescent or young adult in PALS.

Years of marriage between the biological parents of a PALS proband or control after the birth of the youth defined “latency to divorce” in this study. To enable clear analysis of the impact of child behavior as a potential risk factor for divorce, we used the child’s birth date, not the parent’s date of marriage, as the starting point.

Distal child variables. At STP intake (on average, 8 years prior to the first PALS follow-up visit), parents (usually mothers) were asked to indicate the age and race/ethnicity of the proband.

Distal parent variables. Similarly, parent respondents reported during the baseline assessment how many years they had been married to the proband’s biological parent before the birth of the proband, what level of education they had achieved, and whether they had been married previously.

Proximal child variables. Severity of youth ADHD and ODD/CD in childhood was determined during the baseline assessment with the DBD rating scale (Pelham et al., 1992), which asked parents (usually mothers) and teachers to denote the frequency with which children exhibited symptoms of these disorders (0 = Not at All to 3 = Very Much). The maximum ratings across parent and teacher reports of ADHD and ODD/CD symptoms were identified separately for each item and were averaged to create two scores, one indicating the baseline severity of ADHD and one indicating the baseline severity of ODD/CD, for each child.

Proximal parent variables. We administered the Structured Clinical Interview for DSM–IV Axis I Disorders, Nonpatient Edition (SCID-I; First, Spitzer, Gibbon, & Williams, 1996), to mothers and fathers during the first PALS follow-up assessment (on average, 8 years after STP intake) to assess psychiatric symptoms and diagnose disorders according to DSM–IV criteria. SCID-I utilizes an open-ended format designed to approximate the differential diagnosis of an experienced clinician during a clinical diagnostic interview. Test–retest reliability for diagnoses generated by the SCID-I is excellent (Williams et al., 1992). For the purposes of this study, a dichotomous variable (0 = No, 1 = Yes) was generated to indicate whether parents met diagnostic criteria established by the SCID-I for “lifetime” prevalence of major depression and substance abuse disorders. Similarly, we administered the Structured Clinical Interview for DSM–IV Axis II Personality Disorder (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997) during the first PALS follow-up visit to evaluate for lifetime prevalence of antisocial personality disorder. Given the limited number of fathers who participated in PALS, mothers were asked to complete the SCID-II on the biological father of their child in the event the father did not complete the interviews himself. Among the cases included in the Cox regression analyses, 78 (53.1%) included maternal reports of paternal lifetime history of antisocial behavior.

Intercorrelations were computed for the distal/proximal child and parent risk factors among data collected from families of children with ADHD eligible for the Cox regression analyses (n = 147). As shown in Table 2, most correlations were less than .30. Only four correlations were greater than .30: (a) paternal and maternal education (r = .33), (b) maternal and paternal marital history (r = .59), (c) paternal substance abuse and antisocial behavior (r = .42), and (d) child ADHD and ODD/CD severity (r = .37).

Analytical Design

We performed Kaplan–Meier survival analyses to evaluate whether the latency to divorce differed between parents of probands and of controls. Survival time was considered “years of marriage with target child” (x-axis), and the occurrence of a divorce between the biological parents during the lifetime of the proband/control was considered the “critical event.” We used the Breslow statistic to test for between-group differences in the latency to divorce between parents of youths with and without ADHD.

We conducted Cox regression analyses to examine the relative strength of distal/proximal child and parent risk factors toward the prediction of divorce among a subset of families of children with ADHD that were eligible for these analyses. Marital history, substance abuse, parent psychopathology, and child race/ethnicity variables were considered categorical when entered into the regression model. The remaining variables were entered as continuous predictors. No a priori hypotheses were specified regarding whether specific distal/proximal child and parent variables were more likely to uniquely predict divorce. To explore the relative strength of prediction, we entered risk factors into the regression equation as blocks in the following order: distal parent, proximal parent, distal child, and proximal child.
Survival analyses indicated that parents of probands had a shorter latency to divorce than did parents of controls (Breslow = 10.28, p < .01; see Figure 1). Follow-up chi-square analyses revealed that the proportion of parents of probands who had experienced divorce (22.7%) was significantly greater than was that of parents of controls who had experienced divorce (12.6%) by the time their children were 8 years old, \( \chi^2(1, N = 488) = 8.03, p < .01 \). The proportion of families that had experienced divorce after youths were 8 years old did not differ between proband families (15.3%) and control families (10.7%), \( \chi^2(1, N = 488) = 2.15, p = .14 \).

\[ \text{Figure 1. } \text{Survival curves displaying latency to divorce between parents of adolescents and young adults with and without attention-deficit/hyperactivity disorder (ADHD).} \]
substance abuse, maternal depression (2.17), and child race/ethnicity (2.64). Risk of divorce appeared minimal for years married (1.38), maternal (0.77)/paternal (0.75) education, child age (0.56), ADHD severity (1.32), and ODD/CD severity (1.43).

Prospective Cox regression analyses with the subset of proband families that had complete childhood data (n = 147) found that maternal and paternal level of education, paternal lifetime antisocial disorder, child age at STP, child race/ethnicity, and baseline child ODD/CD behavior each uniquely predicted the latency to divorce in families of probands (see Table 3). The rate of divorce increased in families with mothers who had less education, with fathers who had more education and more antisocial behavior, and with younger, racial/ethnic minority children who were attending the STP and had elevated ODD/CD behavior problems. Years of marriage before birth of proband, maternal and paternal marital history, maternal and paternal lifetime history of substance abuse disorder, maternal lifetime history of depression, and proband ADHD behavior at baseline failed to uniquely predict rate of divorce in the regression.

Hazard ratios (likelihood of divorce, given presence of a specific risk factor in the context of other risk factors) highlighted the clear risk of divorce between proband parents if fathers had a lifetime history of antisocial behavior (see Table 3). Hazard also was elevated for proband parents of racial/ethnic minority children and children with higher ODD/CD ratings. Of note, confidence intervals were quite large for the paternal antisocial behavior, child race/ethnicity, and child ODD/CD hazard ratios. Therefore, the reliability of the mean hazard ratios is questionable for these variables. Hazard was relatively small for the other significant predictors of latency to divorce (i.e., maternal/paternal education, child age at STP).

We conducted post hoc analyses to examine an alternative explanation for, and otherwise explicative, the Cox regression results discussed above. First, we explored whether discrepancy in parental education levels predicted latency to divorce in lieu of the unique contribution of individual levels of parental education. Parental education discrepancy was computed by subtracting the highest level of education attained by mothers from the highest level of education attained by fathers. When we substituted parental education discrepancy for maternal/paternal education variables, results indicated that differences in parental education level uniquely predicted rate of divorce (B = 0.48, SE = 0.15, Wald = 10.02, p < .01). Unique and nonsignificant predictors included in the remainder of the Cox regression model were no different from those reported in Table 3 when parent education was entered separately. Thus, parent education discrepancy seems to be a more parsimonious explanation for how education influences the occurrence/rate of divorce between parents of children with ADHD.

Because maternal and paternal education, paternal antisocial behavior, and child ODD/CD variables were significant predictors of divorce latency and correlated strongly with other predictor variables, we conducted post hoc analyses to examine an alternative explanation for, and otherwise explicative, the Cox regression results discussed above. First, we explored whether discrepancy in parental education levels predicted latency to divorce in lieu of the unique contribution of individual levels of parental education. Parental education discrepancy was computed by subtracting the highest level of education attained by mothers from the highest level of education attained by fathers. When we substituted parental education discrepancy for maternal/paternal education variables, results indicated that differences in parental education level uniquely predicted rate of divorce (B = 0.48, SE = 0.15, Wald = 10.02, p < .01). Unique and nonsignificant predictors included in the remainder of the Cox regression model were no different from those reported in Table 3 when parent education was entered separately. Thus, parent education discrepancy seems to be a more parsimonious explanation for how education influences the occurrence/rate of divorce between parents of children with ADHD.

Because maternal and paternal education, paternal antisocial behavior, and child ODD/CD variables were significant predictors of divorce latency and correlated strongly with other predictor variables, we conducted post hoc analyses to examine an alternative explanation for, and otherwise explicative, the Cox regression results discussed above. First, we explored whether discrepancy in parental education levels predicted latency to divorce in lieu of the unique contribution of individual levels of parental education. Parental education discrepancy was computed by subtracting the highest level of education attained by mothers from the highest level of education attained by fathers. When we substituted parental education discrepancy for maternal/paternal education variables, results indicated that differences in parental education level uniquely predicted rate of divorce (B = 0.48, SE = 0.15, Wald = 10.02, p < .01). Unique and nonsignificant predictors included in the remainder of the Cox regression model were no different from those reported in Table 3 when parent education was entered separately. Thus, parent education discrepancy seems to be a more parsimonious explanation for how education influences the occurrence/rate of divorce between parents of children with ADHD.

### Table 3

**Statistics for Cox Regression Model Assessing Prospective Prediction of Latency to Divorce Among Parents of Youths with ADHD**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>Hazard</th>
<th>CI (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distal parent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years married <strong>a</strong></td>
<td>0.01</td>
<td>0.08</td>
<td>0.00</td>
<td>1.01</td>
<td>0.86, 1.17</td>
</tr>
<tr>
<td>Maternal education <strong>b</strong></td>
<td>-0.67</td>
<td>0.26</td>
<td>6.53*</td>
<td>0.52</td>
<td>0.31, 0.86</td>
</tr>
<tr>
<td>Paternal education <strong>b</strong></td>
<td>0.38</td>
<td>0.16</td>
<td>5.61*</td>
<td>1.47</td>
<td>1.07, 2.01</td>
</tr>
<tr>
<td>Maternal marital history <strong>c</strong></td>
<td>0.65</td>
<td>0.87</td>
<td>0.54</td>
<td>1.91</td>
<td>0.34, 10.58</td>
</tr>
<tr>
<td>Paternal marital history <strong>c</strong></td>
<td>0.68</td>
<td>0.76</td>
<td>0.81</td>
<td>1.97</td>
<td>0.45, 8.67</td>
</tr>
<tr>
<td><strong>Proximal parent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal substance abuse <strong>a</strong></td>
<td>0.43</td>
<td>0.55</td>
<td>0.61</td>
<td>1.54</td>
<td>0.52, 4.55</td>
</tr>
<tr>
<td>Paternal substance abuse <strong>a</strong></td>
<td>-0.36</td>
<td>0.56</td>
<td>0.43</td>
<td>0.70</td>
<td>0.23, 2.07</td>
</tr>
<tr>
<td>Maternal depression <strong>c</strong></td>
<td>0.00</td>
<td>0.56</td>
<td>0.00</td>
<td>1.00</td>
<td>0.33, 3.01</td>
</tr>
<tr>
<td>Paternal antisocial <strong>c</strong></td>
<td>2.46</td>
<td>0.63</td>
<td>15.15**</td>
<td>11.75</td>
<td>3.40, 40.61</td>
</tr>
<tr>
<td><strong>Distal child variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child age at STP <strong>b</strong></td>
<td>-0.44</td>
<td>0.14</td>
<td>9.43**</td>
<td>0.64</td>
<td>0.49, 0.85</td>
</tr>
<tr>
<td>Child race/ethnicity <strong>c</strong></td>
<td>1.85</td>
<td>0.67</td>
<td>7.52**</td>
<td>6.34</td>
<td>1.69, 23.74</td>
</tr>
<tr>
<td><strong>Proximal child variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child ADHD <strong>b</strong></td>
<td>-0.38</td>
<td>0.61</td>
<td>0.39</td>
<td>0.68</td>
<td>0.21, 2.26</td>
</tr>
<tr>
<td>Child ODD/CD <strong>b</strong></td>
<td>1.84</td>
<td>0.73</td>
<td>6.27*</td>
<td>6.27</td>
<td>1.49, 26.36</td>
</tr>
</tbody>
</table>

**Note.** n = 147. Overall \( \chi^2 = 53.20, p < .01 \). Wald = test of significance for Cox regression; hazard = odds of divorce over time; years married = years parents were married before birth of child; education = highest level of education achieved by parent (1 = 7th grade education to 9 = Graduate professional training); marital history = percentage married previously (0 = Not previously married, 1 = Previously married); substance abuse = percentage with lifetime history of drug or alcohol abuse/dependence (0 = No abuse/dependence, 1 = History of abuse/dependence); maternal depression = percentage mothers with lifetime history of major depressive disorder (0 = Never depressed, 1 = History of depression); paternal antisocial = percentage fathers with lifetime history of antisocial personality disorder (0 = Never antisocial, 1 = History of antisocial); child age at STP = age at which child attended Summer Treatment Program (STP); child race/ethnicity = percentage of non-Caucasian children (1 = Caucasian, 2 = non-Caucasian); child ADHD = average severity of symptoms of attention-deficit/hyperactivity disorder (ADHD) derived from combined parent and teacher ratings on Disruptive Behavior Disorder (DBD) scale (Pelham et al., 1992; 0 = Not at all, 1 = Just a little, 2 = Pretty much, 3 = Very much) administered at STP intake; child ODD/CD = average severity of symptoms of oppositional–defiant disorder/conduct disorder derived from combined parent and teacher ratings on DBD scale (0 = Not at all, 1 = Just a little, 2 = Pretty much, 3 = Very Much) administered at STP intake.

\( ^a \chi^2 \) change = 12.40, \( p < .05 \). \( ^b \) Continuous predictor. \( ^c \) Categorical predictor. \( ^* \chi^2 \) change = 20.65, \( p < .01 \). \( ^* \chi^2 \) change = 11.30, \( p < .01 \). \( ^* \chi^2 \) change = 6.92, \( p < .05 \).

\( ^p \) change = 53.20, \( p < .01 \). \( ^{**} \) change = 15.15, \( p < .01 \). \( ^{***} \) change = 7.52, \( p < .05 \).
variables included in the model ($r > .30$; see above), we conducted another set of secondary analyses to rule out the effects of multicollinearity in our Cox regression analyses. We tested multicollinearity by running a series of models with highly correlated predictors excluded one at a time. Multicollinearity was assumed to be present if the standard deviations of the point estimates for the predictors remaining in the model changed substantially in the absence of the related variable withheld from the analyses. Tests revealed that standard deviations of maternal and paternal education, paternal antisocial behavior, and child ODD/CD were undisturbed by removal of correlated variables from the model and thereby suggested that our results were not an artifact of, or influenced by, multicollinearity among the predictor variables.

Next, we explored the influence of missing data on the results of the Cox regression analyses. Predictor variables with the highest rates of missing data were maternal and paternal education (17.0% missing), paternal depression (21.8% missing), and paternal antisocial behavior (24.8% missing). When maternal and paternal education was withheld from the full model, the remaining variables from the available cases ($n = 171$) continued to significantly predict rate of divorce (e.g., paternal antisocial behavior, child age, child race/ethnicity, and child ODD/CD were unique, statistically significant predictors at $p < .05$). When maternal depression was withheld, the remaining variables from the available cases ($n = 165$) continued to significantly predict latency to divorce (e.g., maternal/paternal education, paternal antisocial behavior, child age, child race/ethnicity, and ODD/CD were unique, statistically significant predictors at $p < .05$). However, when paternal antisocial behavior was withheld from the model, results of the Cox regression analyses conducted with variables from the available cases ($n = 155$) yielded slightly different results. Paternal education, child age, and child race/ethnicity still significantly predicted rate of divorce, but maternal education and child ODD/CD were no longer statistically significant predictors. Taken together, missing data among the predictor variables generally did not limit conclusions drawn from Cox regression analyses.

Last, we submitted the original Cox regression model to a logistic regression analysis to investigate whether significant predictors of divorce rate would also predict the occurrence of divorce. Results of the logistic regressions indicated that parental antisocial behavior ($B = 2.43, SE = .70$, Wald $= 12.15, p < .01$, hazard $= 11.36$), non-Caucasian descent of the child ($B = 1.83, SE = .84$, Wald $= 4.78, p < .05$, hazard $= 6.21$), and elevated child ODD/CD behavior ratings ($B = 1.72, SE = .88$, Wald $= 3.86, p = .05$, hazard $= 5.61$) each uniquely increased risk of experiencing divorce (overall model, $\chi^2(N = 14) = 40.28, p < .01$). For the logistic regressions, unlike the Cox regressions, only trends for statistical significance emerged for maternal/paternal education level and baseline child age. No predictors that failed to uniquely predict rate of divorce in the Cox regression model significantly predicted occurrence of divorce in the logistic regression analyses. Results of the logistic regression analyses, thus, generally corroborated the findings of the Cox regression analyses.

Discussion

This is the first study to compare the durability of marriages between parents of youths with and without ADHD from their birth through young adulthood. We found that married parents of youths diagnosed with ADHD in childhood demonstrated a shorter latency to divorce than did parents of children without ADHD. Prospective analyses with a subset of families of youths with ADHD showed that child age at referral, race/ethnicity, and ODD/CD symptom severity, as well as maternal/paternal education and paternal antisocial behavior, uniquely predicted latency to divorce.

Parents of youths diagnosed with ADHD in childhood were more likely to divorce by the time their children were 8 years of age (22.7%) than were parents of youths without ADHD (12.6%). These results are similar to findings of Barkley et al. (1990), who reported that mothers of youths with ADHD were three times more likely to separate or divorce from the fathers of their children than were mothers of youths without ADHD. Yet, these findings extend the work of Barkley et al. and others (Brown & Pacini, 1989; Faraone et al., 1991; Jensen et al., 1988) by demonstrating that parents of clinic-referred children with ADHD are more likely to divorce and display a shorter latency to divorce than do parents of children without ADHD. Because parents of youths with ADHD are likely to dissolve marriages more quickly than are parents of youths without ADHD, children with ADHD are at greater risk for poor outcomes upon enduring the deleterious sequelae of divorce upon at an earlier age (Amato, 2000; Emery, 1999).

Certainly, our data should not be interpreted as suggesting that having a child diagnosed with ADHD is the only risk factor for marital dissolution in these families. Rather, disruptive child behavior likely interacts over time with additional family stressors to spark marital conflict and, ultimately, divorce. Surprisingly, only one study (Devine & Forehand, 1996) has prospectively studied the impact of both youth and parent variables toward the prediction of divorce. Devine and Forehand found, somewhat unexpectedly, that adolescent conduct problems and anxious-withdrawn behavior did not contribute to the prediction of parental divorce. Adding to the extant literature, we compared the relative and unique strength of distal/proximal child and parent variables as predictors of latency to divorce in a subset of families of youths diagnosed with ADHD in childhood. Prospective analyses revealed that lower maternal education level, higher paternal education and antisocial behavior, young child age at referral, racially/ethnically diverse children, and elevated child ODD/CD behavior ratings each uniquely increased risk of divorce between parents of youths diagnosed with ADHD in childhood.

We believe this is the first study to find that both parent and child variables uniquely predict the occurrence and rate of divorce. Moreover, this is the only study to demonstrate that severity of disruptive child behavior (specifically, ODD/CD) increases risk of marital dissolution. Externalizing child behavior has been causally linked with factors associated with divorce, such as marital discord (e.g., Wymbs et al., 2007) and parental stress and alcohol consumption (Pelham et al., 1997, 1998). Yet, we found no studies across the divorce literature reporting that proximal child factors account for variance beyond distal/proximal parent factors toward the prediction of marital dissolution. It was surprising that child ADHD symptom severity failed to predict the occurrence or rate of divorce in our sample of families of youths diagnosed with ADHD in childhood. Given the clinic-referred, treatment-seeking nature of the sample, the lack of variability among the pretreatment ADHD ratings may have prevented this variable from contributing
to risk of divorce in our analyses. Alternatively, perhaps children with ADHD and severe ODD/CD are indicators for families having significant difficulty resolving interpersonal conflicts. Indeed, parents of children with ADHD and comorbid ODD/CD tend to engage in more frequent acts of overt interparental conflict and to use more negative verbalizations during child-rearing discussions than do parents of children without ADHD (e.g., Lindahl, 1998; Wymbs et al., 2008). Studies should replicate these analyses with a community sample of children with and without ADHD to allow for an investigation of mediating factors (e.g., parent–child conflict) prospectively linking proximal child variables (e.g., ADHD and ODD/CD symptom severity) with marital discord and divorce.

Child age and race/ethnicity also prospectively predicted divorce in our subset of families of youths with ADHD. Specifically, married parents of young or non-Caucasian children with ADHD were more likely to divorce and to have a shorter latency to divorce than were parents of older or Caucasian children with ADHD. These distal child variables may be proxies for more common precipitants of divorce: racial/ethnic minority parents and marital distress. Adults in racial/ethnic minority groups are less likely to initiate and sustain marriages than are Caucasian adults (Emery, 1999). Further, given the common decline in marital satisfaction upon the start of child rearing, marriages are more at risk to end early in a child’s life than later (Emery, 1999). Because paternal race/ethnicity or marital satisfaction data from couples were not collected at baseline, we were unable to test whether these variables indeed uniquely predicted latency to divorce. Future studies examining predictors of divorce in families of children with ADHD should account for parental race/ethnicity and marital satisfaction in their prospective models.

In a finding similar to those of reviews of nonreferred populations (Emery, 1999) parental education level predicted divorce in our sample of married parents of children with ADHD. Curiously, the direction of the association between parent education and occurrence/rate of divorce differed by parent gender, such that marital dissolution occurred more frequently and more quickly with less educated mothers or more educated fathers. Divorce is more common among undereducated adults (Emery, 1999), so our finding that elevated paternal education levels increased risk of divorce is unusual. Secondary analyses showed that couples with more discrepant levels of education were more likely to experience divorce than were couples with more similar education levels. We are aware of only one other study that has investigated whether differences in educational attainment between spouses forecast marital dissolution. Using a national sample of nonreferred adults, Weiss and Willis (1997) discovered that couples with similar levels of schooling at the time of marriage were less likely to divorce. Therefore, our results suggesting that spousal education difference uniquely predicts the likelihood of divorce in families of youths with ADHD are consistent with the available research.

This study also replicated the findings of Lahey et al. (1988), who reported that divorce between parents of children with disruptive behavior disorders was associated with parental antisocial behavior. Indeed, relative risk and hazard ratios indicated that married parents of youths with ADHD in this study were much more likely to eventually divorce if the father evinced a lifetime history of antisocial personality disorder. The relative weight of this variable was notable, given that additional risk factors in the regression model commonly associated with marital dissolution and antisocial behavior (e.g., history of divorce, paternal substance abuse, maternal depression) failed to significantly predict rate of divorce in the context of paternal antisocial behavior. Secondary analyses showing that proximal child risk factors (specifically, ODD/CD severity) predicted rate of divorce only when considered in the context of paternal antisociality also underscored the relative importance of paternal antisocial behavior in models of divorce. Work is needed to test potential mechanisms (e.g., genetics) linking paternal antisociality and marital dissolution in families of children with ADHD.

The generalizability of results discussed above is limited, for a number of reasons. Given the composition of our sample, findings may not be relevant other than for families of college-educated, Caucasian parents with male children. Similarly, results of the Cox regression analyses presented herein may not hold true for parents whose children with ADHD are undiagnosed or untreated in childhood or for parents of children with ADHD who divorce early. It is also difficult to disentangle whether elevated rates of divorce in the ADHD families in this study are unique to ADHD or hold for clinic-referred families in general. Still, at least one study has indicated that marital dissolution is more common in families of youths with conduct disorder than in families of youths with anxiety or depressive disorders (Fendrich, Warner, & Weissman, 1990). Confidence intervals for several hazard ratios, particularly paternal antisocial behavior, child race/ethnicity, and child ODD/CD severity, were quite large. Caution should be taken before relying on the mean hazard ratios presented for these variables. A subset of the paternal antisocial behavior ratings was completed by mothers; this potentially confounded the outcome of the regression analyses, particularly among mothers who had divorced their child’s father. Although the use of such variables is theoretically and empirically justified, only two child and four parent psychopathology variables were entered as proximal predictors of divorce. Additional forms of child psychopathology (e.g., internalizing symptoms; Strohschein, 2005) and parent psychopathology (e.g., anxiety, ADHD; Robin & Payson, 2002; Yoon & Zinzarg, 2007) may influence the longitudinal course of marriages between parents of children with ADHD. Relatedly, additional distal child (e.g., IQ) and parent (e.g., attitude toward divorce) factors not included in our model may contribute to risk of divorce. Last, although careful training prepared research staff for conducting clinical interviews, interrater reliability data were unavailable when this article was prepared. Thus, some error may be present among these data.

Despite these limitations, our findings demonstrate the likelihood of divorce among married parents of youths diagnosed with ADHD in childhood. These data are of concern in light of evidence underscoring the generally negative consequences of divorce both for children and for adults (Amato, 2000). Clearly, there is a need for studies that investigate means to broaden the therapeutic effect of evidence-based treatments for ADHD in order to enhance marital stability in these families (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). One promising direction is evaluating the efficacy of relationship distress/divorce prevention programming for parent couples of youths with ADHD. Relationship distress and divorce prevention protocols have a substantial evidence base in nonreferred populations (Halford, Markman, Kline, & Stanley, 2003) and include demonstrations of longitudinal maintenance (e.g., Markman, Renick, Floyd, Stanley, & Clements,
1993). Given the benefits of brief marital therapy for distressed parents of children with ODD/CD who are receiving behavioral parent training (e.g., Dadds, Schwartz, & Sanders, 1987), delivery of relationship distress/divorce prevention programs as an adjunctive treatment for married parents of young children with ADHD may improve long-term marital relations and child outcomes in these families. Furthermore, in light of evidence underscoring the likelihood of children’s being prescribed stimulant medication around the time of parental divorce (Strohschein, 2007), implementation of relationship distress/divorce prevention programming in conjunction with behavioral parent training may also reduce the need for children with ADHD and disruptive behavior disorders to take medication unnecessarily.

This study brings to light the susceptibility to divorce of married parents of youths diagnosed with ADHD. It is important to note, however, that marital dissolution is not always harmful to those involved. In fact, most children—especially those whose parents no longer engage in intense conflict—are resilient (Kelly & Emery, 2003). Unfortunately, children who exhibit chronic behavior problems prior to divorce are likely to react poorly to marital dissolution (Hetherington & Stanley-Hagan, 1999). With this in mind, clinicians and researchers who treat children with ADHD and disruptive behavior disorders should routinely assess marital functioning between the children’s parents and, if need be, intervene with discordant parents to prevent these children from experiencing the negative effects of divorce. On the other hand, because divorce may promote better outcomes for children than would continuing to witness frequent, intense, and unresolved marital conflict, particularly regarding child-rearing issues (Cummings & Davies, 1994; Emery, 1999), marital dissolution may be an appropriate outcome for highly distressed couples raising difficult-to-manage children.

References