

Parental Divorce, Marital Conflict and Children's Behavior Problems: A Comparison of Adopted and Biological Children

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We used adopted and biological children from Waves 1 and 2 of the National Survey of Families and Households to study the links between parents' marital conflict, divorce and children's behavior problems. The standard family environment model assumes that marital conflict and divorce increase the risk of children's behavior problems. The passive genetic model assumes that parents' and children's behavior are linked because of genetic transmission from parents to children. The child effects model assumes that parents' marital distress is the result of (rather than the cause of) children's behavior. Our analysis shows that the associations between parents' divorce and marital conflict and children's behavior problems are comparable for biological and adopted children. Moreover, the primary direction of influence appears to run from parents to children. Taken together, these results provide support for the standard family environment model.

A large number of studies conducted during the past three decades have shown that children with divorced parents have an elevated risk of a variety of problems, including conduct disorders, emotional disturbances, difficulties with social relationships and academic failure (Amato 2000). This topic has been of interest to social scientists from a variety of disciplines, including demography (Cherlin 1999), family sociology (Booth and Amato 2001), education (Pong, Dronkers and Hampden-Thompson 2003), criminology (Thornberry, Smith, Rivera, Huizinga and Stouthamer-Loeber 1999), economics (Havemann 1994), and child psychology (Emery 1999). Similarly, studies have shown that in the absence of divorce, exposure to chronic, unresolved conflict between parents increases the risk of comparable problems for children (Amato and Booth 1997; Emery 1999; Krishnakumar and Buehler 2000). Not all children who experience divorce or who grow up with chronically discordant parents develop serious problems. Nevertheless, these findings indicate that further research on the causal linkages between these variables is warranted.

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Three broad theoretical perspectives are relevant to this literature. The first perspective, which we refer to as the standard family environment model, is the most popular. This perspective assumes that dysfunctional two-parent families and many single-parent families formed through divorce are less than optimal settings for children's socialization and development. Consequently, exposure to these environments increases the risk of a variety of problems for the children.

In recent years, researchers in the field of behavior genetics have challenged the standard family environment model. Studies from this literature suggest that many of the links between family risk factors and children's adjustment – links that were once thought to be entirely environmental – have a strong genetic component (Harris 1998; Towers, Spotts and Neiderhiser 2001; Rowe 1994). According to this perspective, parents with problematic personality traits, such as neuroticism or a predisposition to engage in antisocial behavior, are more likely than other parents to experience marital discord and end their marriages in divorce. Because parents transmit these traits to their progeny genetically, children in these families are prone to a variety of disorders. According to this scenario, the links between parents' marital distress and children's behavioral and emotional problems are spurious. Genetically inherited predispositions are the causal mechanism connecting parents' and children's problems.

A child effects model also challenges the standard family environment model. Advocates of this perspective point out that the vast majority of studies in this literature involve correlations derived from cross-sectional data. An alternative explanation for these results is equally plausible: Children's behavior and emotional problems are a cause of discord between parents. Cross-sectional studies cannot distinguish between these two explanations. (For a review of these perspectives, see Ambert 2001; Crouter and Booth 2003.)

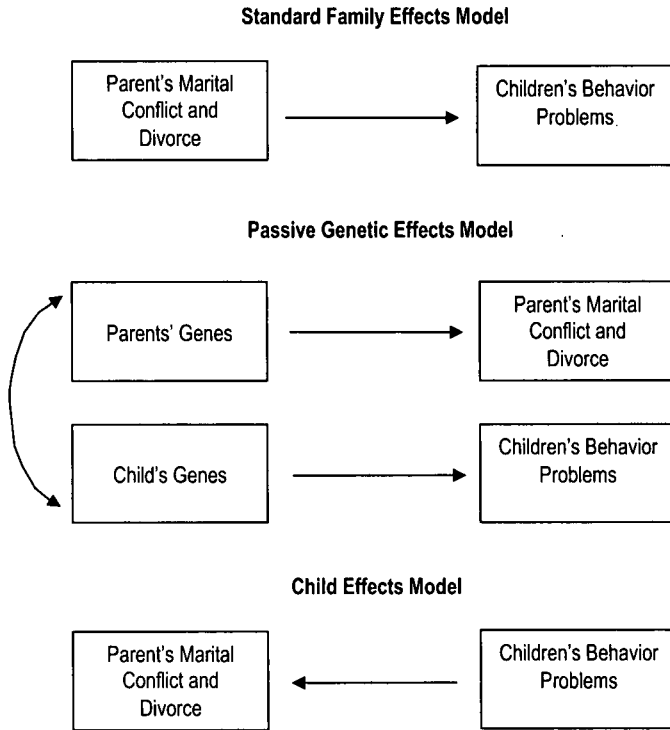
This article compares the standard family environment model, the genetic model and the child effects model. We compare adopted and biological children to estimate the role of genetic factors in explaining the association between parental divorce and children's behavior problems, and we use longitudinal data to estimate the direction of causal influence between parents' marital conflict and children's behavior problems. Data come from Waves 1 and 2 of the National Survey of Families and Households.

Theory

The Standard Family Environment Model

The standard model used by most social scientists assumes that the quality and stability of the parents' marriage affects children's chances

Figure 1. Links Between Parents' Marital Conflict and Divorce and Children's Behavior Problems



of developing a variety of emotional, behavioral and academic problems. This model, which involves a direct path from parents' marital discord and divorce to children's behavior problems, is illustrated in Figure 1.

Why should exposure to marital conflict and instability have negative consequences for children? Several mechanisms are likely to be responsible. First, observing overt conflict between parents is a direct stressor for children. Observational studies reveal that children react to interparental conflict with fear, anger or the inhibition of normal behavior (Cummings 1987). Preschool children – who tend to be egocentric – may blame themselves for marital conflict, resulting in feelings of guilt and lowered self-esteem (Grych and Fincham 1990). Conflict between parents also tends to spill over and negatively affect the quality of parents' interactions with their children (Davies and Cummings 1994; Hetherington and Clingempeel 1992). For example, Gerard, Krishnakumar and Buehler (2006) found that the associations between marital conflict and children's externalizing and internalizing problems were largely mediated by parents' use of harsh punishment and parent-child conflict. Furthermore, through

modeling verbal or physical aggression, parents "teach" their children that disagreements are resolved through conflict rather than calm discussion. As a result, children may not learn the social skills (such as the ability to negotiate and reach compromises) that are necessary to form mutually rewarding relationships with peers (Amato and Booth 2001).

Divorce is not a single event but a process that unfolds over time. Family problems, such as substance abuse and economic hardship, are predictors of divorce (Amato and Previti 2003). Divorce is often preceded by a period of overt conflict or mutual disengagement between spouses. In addition, divorce is often followed by a series of difficult circumstances for children, including reduced contact with the noncustodial parent, continuing rancor between parents, a decline in children's standard of living, and a move – often to neighborhoods with fewer community resources (Amato 2000). In addition, most parents find new partners following divorce, and many children find dealing with stepparents (whether married or cohabiting) challenging (Hetherington and Jodl 1994). The creation of new parental unions also means that many children experience additional union dissolutions, which adds to the turmoil in their lives (Fomby and Cherlin 2007). Overall, divorce is a summary variable that represents a variety of circumstances that many children experience as stressful.

The Passive Genetic Model

Behavioral genetics research indicates that many personality traits, such as a depression, neuroticism and antisocial behavior, have a strong genetic component (Plomin 1994). These studies typically compare concordance for behaviors across monozygotic (identical) and dizygotic (fraternal) twin pairs. For a particular trait, if the correlation between monozygotic twins is larger than the correlation between dizygotic twins, then genetic factors are implicated. Twin studies generally indicate that half or more of the variance in many behavioral predispositions and personality traits (across a variety of domains) is due to genetic factors. Studies that incorporate a broader range of sibling pairs (monozygotic twins, dizygotic twins, non-twin full siblings, half-siblings and step-siblings) yield similar results (Reiss, Neiderhiser, Hetherington and Plomin 2000.)

Research indicates that spouses who exhibit antisocial personality traits, show symptoms of neuroticism or experience chronic depression are more likely to report marital problems and end their marriages through divorce than are other spouses (Brody, Neuman and Forehand 1988; Capaldi and Patterson 1991). Consistent with these findings, behavioral genetics studies show that adults' reports of general family conflict, marital satisfaction and divorce all have significant genetic components (Jockin, McGue and Lykken 1996; McGue and Lykken 1992; Plomin, McClearn, Pedersen,

Nesselroade and Bergeman 1989; Towers, Spotts and Neiderhiser 2001). Of course, it is unlikely that a "divorce" or "marital unhappiness" gene exists. Nevertheless, genetically inherited traits may predispose people to act in ways that lower the quality of long-term relationships and increase the risk of marital dissolution.

The passive genetic model is represented in Figure 1 as a direct path between parents' genetic predispositions and marital distress. Children share approximately 50 percent of their genes with each parent, which is represented in Figure 1 as a correlation between parents' and children's genes. These shared genetic predispositions mean that parents' marital distress and children's behavior problems are positively correlated. This observed correlation, however, is either partly or completely spurious. Because parents provide genes as well as environments to their children, observed correlations between parents' and children's behavior substantially overestimate the effect of the family environment.

The Child Effects Model

This model assumes that the links between children's and parents' behavior are due to the causal effect of children on parents. Bell (1968) first drew attention to this possibility when he pointed out that most correlational studies cannot distinguish between the parent's influence on the child and the child's influence on the parent. Since then, the belief that children affect the behavior of their parents has gained wide acceptance among social scientists (Ambert 2001; Booth and Crouter 2003). For example, a substantial number of studies show that mothers of "difficult" infants – infants who express a good deal of negative emotionality – report less confidence and more symptoms of stress and depression than do mothers of other infants (Crockenberg and Leerkes 2003).

If parents do not affect their children as much as one tends to think, then what is the source of variability in children's behavior? Genes represent a plausible source. An *evocative* genetic model assumes that children's temperaments, based on genetic predispositions, evoke certain behaviors on the part of parents (Reiss et al. 2000). For example, badly behaved children may increase the level of tension between parents, leading to a positive correlation between marital conflict and children's misbehavior. Studies showing that parents treat biological siblings more similarly than they treat adopted siblings are consistent with an evocative genetic model. In other words, genetically based traits that biological (but not adopted) siblings share should evoke similar responses from parents (Reiss 2003).

The child effects model does not necessarily require the assumption that all child problems are genetically inherited. Children and adolescents may exhibit behavior problems due to a variety of nonparental sources,

such as peers, neighborhoods or the media. Irrespective of the source of these problems, advocates of this perspective assume that parents' behavior (including marital conflict) is often a reaction to, rather than a cause of, child misbehavior.

Empirical Support for the Three Models

Some researchers have used sophisticated statistical methods to assess whether parental separation has a causal effect on children, including fixed-effects models (Cherlin, Chase-Lansdale and McRae 1998), biprobit analyses with correlated error terms (McLanahan and Sandefur 1994), instrumental variable approaches (Gruber 2004), and propensity score analysis (Amato 2004). These studies generally claim to find evidence for a causal effect of family disruption on children's well-being, net of observed and unobserved selection factors. Nevertheless, these studies contain important limitations. For example, many of these methods, such as fixed-effects models, control for omitted variables that do not vary over time. Genetic factors, however, are not constant. Instead, particular genes are active or inactive at different stages of development, and environmental events can "turn off" or "activate" certain genes (Reiss et al. 2000). For these reasons, existing studies provide suggestive but not conclusive evidence against genetic explanations.

Other studies have used genetically informed designs to assess this issue. Although twin designs are commonly used in this literature, another rigorous design involves comparisons of adopted and biological children. McCartney (2003) argued that adoption studies are more powerful than twin studies for assessing genetic and environmental influences on children. Adoption studies offer a quasi-experimental approach, with the correlations between parents' and children's behavior reflecting pure environmental effects, uncontaminated by genetic factors. Researchers who use this design examine the links between divorce (or some other family variable) on outcomes among biological and adopted children. If the association between parental divorce and a child outcome is similar for biological and adopted children, then the standard family environment model is supported. This conclusion is warranted because adoptive children and their social parents are not related biologically. If an association between parental divorce and a child outcome appears among biological children but not among adopted children, however, then the passive genetic model is supported. Finally, if an association appears among both groups of children, but if the association is stronger for biological than for adopted children, then both perspectives are supported.

Although several studies have used this strategy for studying parental divorce, the results are mixed. Brodzinsky, Hitt and Smith (1993) found

that the associations between parental divorce and several forms of child adjustment (internalizing behavior, externalizing behavior and social competence) were similar for adopted and biological children – a pattern consistent with the standard family environment model. Similarly, O'Connor, Caspi, DeFries and Plomin (2000) used data from the Colorado Adoption Project to examine the links between parental divorce and several child outcomes. In this study, children who experienced parental divorce tended to exhibit more behavior problems, were more likely to engage in substance abuse, had lower levels of academic achievement, and scored lower on measures of social adjustment than did other children. The associations between parental divorce and measures of children's behavior problems and substance use were comparable for adopted and biological children – a finding that supports the standard family environment model. In contrast, the associations between parental divorce and measures of children's school achievement and social adjustment were apparent among biological children but not among adopted children – findings that support the passive genetic model.

Few studies have assessed whether the links between parents' marital distress and children's behavior problems are due to child effects. Nevertheless, some related research supports this possibility. Hetherington and Kelly (2002) used cross-lagged models to show that stepfather involvement was driven primarily by stepchildren's behavior, rather than the reverse. Similarly, studies have shown that parental monitoring is largely a function of children's willingness to disclose information to parents, rather than parents' active efforts to supervise their children (Crouter and Head 2002). For example, Stattin and Kerr (2000) found that children's willingness to engage in self-disclosure was a stronger predictor of parents' knowledge about their children's lives than were parents' use of questioning or their emphasis on following rules. Although not directly related to marital conflict, these studies suggest that many findings that earlier researchers attributed to parental influence actually reflect children's influence on parents.

Contributions of the Present Study

The present study makes three contributions to the research literature. First, the number of studies that have compared adopted and biological children is small. Moreover, prior studies have not been based on national, random samples. Brodzinski et al. (1993) relied on a small convenience sample of 59 children from divorced families and 64 children from non-divorced families. The O'Connor et al. (2000) study was based on children selected from two adoption agencies and several hospitals in Colorado. Although this sample size was relatively large for a psychological study (188 adopted and 210 biological children), the results of their research, although

informative, cannot be generalized to a larger population. Given the small number of relevant studies, additional studies that compare adopted and biological children are necessary to draw firmer conclusions about the role of genetic vs. family environment factors in shaping children's behavior problems. The present study contributes to this goal by estimating the effects of marital conflict and divorce among adopted and biological children from Waves 1 and 2 of the National Survey of Families. Although this data set is based on a national sample of children and families, it is limited by the fact that any random sample (without oversampling) will produce only a small number of adopted children. Second, the current study focuses not only on parental divorce, but also on parents' marital conflict in continuously intact marriages. And third, two-wave longitudinal data make it possible to assess the direction of influence between marital conflict and children's behavior problems.

Methods

Sample

The first wave of the NSFH was conducted in 1987-88 and involved a multistage probability sample of 13,007 adult respondents (Sweet, Bumpass, and Call 1988). In the main interview, parents answered an extensive series of questions about a focal child. Parents also answered a shorter series of questions about *all* children in the household between the ages of 5 and 18, and these latter data were used in the present study. The first analysis involved two groups: (1. children who lived continuously with two biological or adoptive parents, and (2. children who experienced the divorce of their biological or adoptive parents and whose custodial parent had not remarried. Children born outside of marriage or who experienced the death of a biological or adoptive parent were omitted. Children adopted by a stepparent also were omitted, because these children are genetically related to the custodial parent. These restrictions resulted in a sample of 4,997 children living in 2,839 households. Of these children, 4,877 were biological and 120 were adopted.

The second analysis was based on longitudinal data. Interviewers contacted respondents again in 1992-94. (See Sweet and Bumpass, 1996, for details.) Of the 2,839 parent respondents in the first wave, 17 percent did not complete the second interview.¹ In addition, many children aged out of the sample, that is, they were older than 18 in Wave 2. Although it was easy to match the focal child across interviews, it was difficult to match other children in the household because their identification numbers differed. Consequently, the two-wave analysis was restricted to the focal child – the one child who could be matched

unambiguously across surveys. This decision resulted in a sample of 1,394 biological and 50 adopted children.

Variables

In both waves, the main respondent was asked a series of binary questions about behavior problems among all of the children living in the household between the ages of 5 and 18: (1. Have any of these children ever repeated a grade? (2. In the past year, have you been asked to meet with a teacher or principal because of behavioral problems of any of the children? (3. Have any of the children ever been suspended or expelled from school? (4. Have any of the children ever been in trouble with the police? (5. Have any of the children ever seen a doctor or therapist about any emotional or behavioral problems? (6. Sometimes, for one reason or another, some children are particularly difficult to raise. Would you describe any of your children as particularly difficult to raise? (An item on running away from home was omitted because few parents reported this problem.) Data from each child in the household appeared in the analysis.

Parental divorce at Wave 1 was a dichotomous variable that indicated whether children's biological or adopted parents had divorced prior to the first interview (0 = *continuously married*, 1 = *divorced*).

Among married parents, marital conflict was based on the following six questions: "How often, if at all, in the last year have you had open disagreements about each of the following: Household tasks? Money? Spending time together? Sex? In-laws? The children?" Response options were 1 = *never*, 2 = *less than once a month*, 3 = *several times a month*, 4 = *about once a week*, 5 = *several times a week*, 6 = *almost every day*. (We omitted an additional question on having another child because it was weakly correlated with the other items.) Both the main respondent and the respondent's spouse answered these questions in Waves 1 and 2. Alpha reliability coefficients were .77 for respondents in Wave 1, .80 for spouses in Wave 1, .78 for respondents in Wave 2, and .76 for spouses in Wave 2. Correlations between respondents' and spouses' scores were $r = .41$ in Wave 1 and $r = .35$ in Wave 2 (both $p < .001$).

Control variables included the child's gender (0 = *son*, 1 = *daughter*), the child's age in years, the number of siblings living in the household, the main respondent's gender (0 = *father*, 1 = *mother*), the main respondent's race (with separate dummy variables for black and Latino), and the main respondent's education (0 = *no formal education*, 20 = *doctorate*). Income did not serve as a control variable in the divorce analysis, because a decline in children's standard of living is a common result of divorce (McLanahan and Sandefur 1994). Income was controlled, however, in the marital conflict analysis.²

Analytic Strategy

To analyze the six behavior problems noted earlier, *Mplus* software created a latent variable based on binary indicators (Muthén and Muthén 2005). This approach is equivalent to an item response theory model. IRT treats discrete outcomes as reflections of an underlying latent trait that is assumed to be normally distributed in the population (Hambleton, Swaminathan and Rogers 1991). IRT has been used successfully in the criminology literature to deal with the shortcomings of traditional scales based on counts of delinquent or deviant activities, which tend to be highly skewed (Osgood, McMorris and Potenza 2002). The factor loadings were based on robust weighted least squares estimation of probit regression coefficients, rather than the more commonly used maximum likelihood estimation of logistic regression coefficients. Because numerical integration is not required with weighted least squares, estimation is much faster. Moreover, maximum likelihood estimation was not available in *Mplus* for some of the models.³

In the cross-sectional analysis, Wave 1 data were used to estimate the effect of parental divorce on children's behavior problems. The longitudinal analysis focused on the associations between parents' marital conflict and children's behavior problems in Wave 2. *Mplus* estimated simultaneous reciprocal paths between (a) parents' marital conflict at t_1 and children's behavior problems at t_2 and (b) children's behavior problems at t_1 and parents' marital conflict at t_2 . The corresponding Wave 1 variables served as instruments to identify the model. Reciprocal effects models are useful because they reflect the assumption that the family is a dynamic system in which changes in one component are accompanied by changes in other components. (See Bollen 1989 for a discussion of recursive models, and Amato and Booth 1995 for an empirical example.)⁴

Mplus software adjusted the standard errors for the clustering of cases (children) within families and sample weights for the descriptive data in Table 1. We did not weight the data in the regression analyses because some of the independent variables were used in the construction of the NSFH weight variable (Winship and Radbill 1994).

Results

Parental Divorce and Children's Behavior Problems

Table 1 shows the means and standard deviations for Wave 1 sample characteristics (in the first three columns) with separate values for biological and adopted children. Biological and adopted children did not differ with respect to age, gender, number of siblings or whether

Table 1: Descriptive Statistics by Child's Adoption Status

Variable		Biological Children	Adopted Children	t/χ^2
Child Age	M	11.82	12.32	1.50
	(S)	(3.81)	(3.75)	
Daughter	%	51	49	.24
Number of Siblings	M	1.75	1.51	1.76
	(S)	(1.43)	(1.27)	
Mother Respondent	%	56	60	1.07
Parent Education	M	12.80	14.42	5.77***
	(S)	(3.18)	(3.31)	
Household Income	M	43.69	62.77	4.23***
	(S)	(51.39)	(54.61)	
Black	%	11	4	5.43*
Hispanic	%	12	3	9.56**
Parents Divorced	%	12	9	.83
Behavior Problems	M	-.10	.44	6.69***
	(S)	(.92)	(1.26)	

Note: Means and standard deviations in table are weighted. Maximum sample size is 4,877 biological children and 120 adopted children (unweighted). For significance testing, standard errors are adjusted for clustering of children within families.

* $p < .05$ ** $p < .01$ *** $p < .001$. (two-tailed).

the mother (or father) served as the primary respondent. Compared with biological children, adopted children had better educated parents, more family income and were less likely to be African American or Hispanic. Consistent with prior research, these results indicate that adopted children tend to live in relatively advantaged households (Ceballos, Lansford, Abbey and Stewart 2004; Hamilton, Cheng and Powell 2007). Despite these structural advantages, adopted children scored about one-half of a standard deviation higher than did biological children on the behavior problems measure. This result is consistent with prior work showing that adopted children are at greater risk than are biological children for a variety of behavioral and emotional problems (Lansford, Ceballos, Abbey and Stewart 2001).

Although not shown in Table 1, we also looked specifically at the sample of children who experienced divorce. Adopted and biological children with divorced parents did not differ with respect to gender or age. Mean age at the time of divorce, however, was eight years for adopted children and six years for biological children ($p < .05$). Correspondingly, the mean number of years since divorce was five for adopted children and seven for biological children ($p < .05$). These differences were not problematic, however, because supplementary analyses showed that neither age at divorce nor the length of time since divorce was correlated significantly with children's behavior problems.

Table 2: Regression of Children's Behavior Problems on Parental Divorce

Variables	Biological Children			Adopted Children		
	b	(SE)	beta	b	(SE)	beta
Divorce	.434***	(.031)	.202	.812***	(.278)	.252
Parent Education	-.013*	(.005)	-.041	.019	(.032)	-.052
Parent Black	-.104**	(.036)	-.040	-.371	(.396)	-.084
Parent Hispanic	-.140**	(.045)	-.049	-.584	(.492)	-.104
Number of Siblings	-.025	(.010)	-.036	.116	(.084)	.120
Child Age	.047***	(.004)	.179	.064*	(.029)	.189
Daughter	-.294***	(.027)	-.148	-.403	(.215)	-.164
Mother Respondent	.067*	(.031)	.032	-.228	(.225)	-.089
R ²	.113			.167		

Note: N = 4,877 biological children and 120 adopted children. Estimates are based on *Mplus* with behavior problems represented as a binary latent variable. Because the dependent variable is standardized, *b* coefficients can be interpreted as effect sizes. Standard errors are adjusted for clustering of children within families.

p* < .05 *p* < .01 ****p* < .001. (two-tailed).

The next step involved estimating the measurement model for behavior problems in Wave 1. The measurement model fit the data well: $\chi^2 = 86.43$, *df* = 8, Comparative Fit Index = .96, Tucker-Lewis Index = .94, Root Mean Square Error of Approximation = .04. The standardized factor loadings for the six items ranged from .42 to .78. *Mplus* generated and saved factor scores for all cases. This step simplified the number of parameters that had to be estimated in the structural analyses – a useful step, given the small number of adopted children in our sample.

Table 2 shows the results of an analysis in which the behavior problem variable was regressed on parental divorce and the control variables. Parameters were estimated simultaneously for biological and adopted children and were allowed to vary freely between the two groups. For biological children, the *b* coefficient for divorce was .43. Because divorce was dichotomous and the dependent variable (behavior problems) was standardized, this coefficient can be interpreted as an effect size. In other words, biological children with divorced parents scored more than 40 percent of a standard deviation higher on the latent variable (on average) than did children with two continuously married parents. Most observers would consider an effect size of this magnitude to be moderate (Cohen 1988). The corresponding coefficient was large for children with adopted parents. The value of .81 indicates that adopted children with divorced parents scored more than three-fourths of a standard deviation higher than did adopted children with continuously married parents. (Note that this was a saturated model with no degrees of freedom, so the χ^2 value was zero.)

Because the effect size for divorce appeared to be larger for adopted children than for biological children, a second analysis constrained the divorce coefficients to be equal across groups. The difference in chi-square values between the unconstrained and constrained models was not significant ($\Delta\chi^2 = 1.33$, $df = 1$, $p > .1$). This result indicates that the estimated effect of divorce on children's behavior problems did not differ between the two groups of children. Of course, given the small size of the adopted sample, the power of this test to detect a significant difference between groups is weak. Nevertheless, the main finding – a statistically significant link between divorce and behavior problems in both groups despite the small number of adopted children – supports the standard family environment model.

Marital Conflict and Children's Behavior Problems

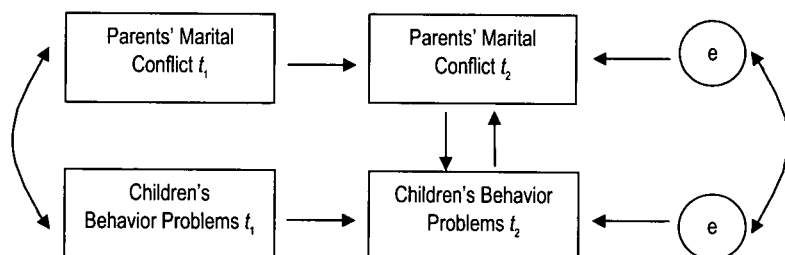
With respect to the longitudinal analysis, as in the cross-sectional analysis, biological and adopted children did not differ in age or gender. Adopted children, however, were more likely to have a mother respondent as well as a larger number of siblings. These differences reflect differential attrition and the removal of some families from the sample through divorce. As noted earlier, adopted children were more advantaged with respect to parent education and income than were biological children. Although marital conflict scores were lower for adopted children than for biological children, this difference did not attain statistical significance.

The next step required estimating a measurement model for parents' marital conflict in the two waves. The model involved two latent variables: one based on the main respondent's and spouse's reports of conflict in Wave 1, and the second on the main respondent's and spouse's reports of conflict in Wave 2. The factor loadings were constrained to be the same in both waves. This model fit the data well: $\chi^2 = 0.36$, $df = 1$, $CFI = 1.00$, $TLI = 1.00$, $RMSEA = .00$. Factors scores based on the measurement model were saved for subsequent analyses.

Figure 2 shows the structural model for the two-wave analysis of marital conflict. This model included factor scores for children's behavior problems in both waves, along with the factor scores for marital conflict. The t_2 scores, with the t_1 scores controlled, are conceptually similar to change scores. In other words, the model estimates how changes in marital conflict between t_1 and t_2 were related to changes in behavior problems between t_1 and t_2 . (The same principle applies to changes in behavior problems between t_1 and t_2 and changes in marital conflict between t_1 and t_2 .) Although not shown in the figure, the model also includes the same control variables used in Table 2, along with family income.

The first test of this model pooled biological and adopted children and used a binary variable to reflect adoption status. The results of this analysis

Figure 2. Reciprocal Paths Between Parents' Marital Conflict and Children's Behavior Problems



appear in Table 3. The stability coefficients between waves were moderate for both variables: .50 for marital conflict and .52 for children's behavior problems. The path from t_2 marital conflict to t_2 behavior problems was .21 ($p < .001$), whereas the corresponding path from t_2 behavior problems to t_2 marital conflict was not significant. These results do not support the child effects model. Instead, they suggest that an increase in marital conflict was accompanied by an increase in children's behavior problems. (Because linear associations are symmetrical, the reverse also is true: A decrease in marital conflict was accompanied by a decline in children's behavior problems.) Changes in children's behavior problems, in contrast, did not predict changes in marital conflict. These results, however, cannot distinguish between the standard family environment model and the passive genetic model.

Separate analyses also were conducted for biological and adopted children. Because only 50 adopted children were in the analysis, the control variables were excluded. Although this exclusion did not affect the results, it kept the ratio of cases to parameters among adopted children in line with the minimum recommended by Kline (2005). When all parameters were allowed to vary freely across groups, the estimated effect of t_2 marital conflict on t_2 behavior problems was significant among biological children ($b = .23$, $SE = .02$, $p < .001$) and adopted children ($b = .28$, $SE = .11$, $p < .05$). The estimated effect of t_2 children's behavior problems on t_2 marital conflict was not significant for biological children (-.08) or adopted children (-.12). A test of the significance between coefficients yielded null results ($\Delta\chi^2 = .983$, $df = 1$, $p = .683$). Despite the small number of cases in the adopted sample, the key point is that the estimated effect of marital conflict on behavior problems was significant and comparable in magnitude in both groups.⁵

Discussion

We outlined three theoretical perspectives that account for the frequently replicated links between parents' marital distress and children's behavior

Table 3: Associations Between Marital Conflict and Children's Behavior Problems

Predictors	Dependent Variables					
	Marital conflict t_1			Behavior problems t_1		
	<i>b</i>	(SE)	beta	<i>b</i>	(SE)	beta
Marital Conflict t_1	.499***	(.029)	.499	—	—	—
Marital Conflict t_2	—	—	—	.206***	(.046)	.206
Behavior Problems t_1	—	—	—	.516***	(.023)	.516
Behavior Problems t_2	-.086	(.068)	-.086	—	—	—
Adopted	-.232	(.217)	-.042	.581**	(.168)	.106
Parent Education	-.027**	(.019)	-.076	-.007	(.008)	-.020
Income (log)	.046	(.039)	.045	-.048	(.031)	-.048
Parent Black	.158*	(.075)	.056	.006	(.059)	.002
Parent Hispanic	.297**	(.102)	.081	-.058	(.081)	-.016
Number of Siblings	.052*	(.025)	.056	-.032	(.019)	-.035
Child Age	.157*	(.076)	.347	.050***	(.008)	.250
Daughter	.057	(.055)	.028	-.127**	(.043)	-.063
Mother Respondent	.018	(.062)	.008	-.009	(.048)	-.004
R ²	.343			.387		

Note: N = 1,464.

* $p < .05$ ** $p < .01$ *** $p < .001$. (two-tailed).

problems. The standard family environment model assumes that marital conflict and divorce increase the risk of problematic outcomes for children. Two more recent perspectives challenge this model. The passive genetic model assumes that parents with problematic traits (such as neuroticism or a tendency to engage in antisocial behavior) are more likely than other parents to experience marital discord or see their marriages end in divorce. If these traits are transmitted genetically from parents to children, then the children of these marriages also will have an elevated risk of developing behavior problems. According to this perspective, the link between parents' marital distress and child problems is spurious, with the central causal mechanism being the genetic transmission of personality traits and behavioral predispositions from parents to children. The child effects model, in contrast, assumes that children who exhibit an elevated number of problems put stress on their parents' marriages, resulting in greater discord. Because most prior studies have relied on cross-sectional samples of biological parents and children, it has not been possible to distinguish between these three explanations.

The current study, based on two waves of data from biological and adopted children, provides consistent support for the standard family environment model. In the first analysis, based on the first wave of data from the NSFH, divorced parents reported more behavior problems among their children than did continuously married parents – a result consistent with a large number of prior studies (Amato 2000). More importantly,

divorce was associated significantly with behavior problems among adopted as well as biological children. These results support the standard family environment model.

The longitudinal analysis examined the links between parents' marital conflict and children's behavior problems using models with reciprocal paths. Consistent with the standard family environment model, the estimated path from marital discord to behavior problems was statistically significant (see Table 3). Moreover, the estimated path from marital discord to behavior problems was significant among adopted as well as biological children. Contrary to the child effects model, the estimated causal path from behavior problems to marital discord was not significant, either in the pooled sample or in the separate samples of biological and adopted children. These results provide consistent support for the standard family environment model.

Without experimental data, one cannot reach definitive conclusions about causality. Nevertheless, the current research finds consistent evidence that marital conflict and divorce increase the risk of children's problems. Being able to rule out alternative explanations, including child effects and passive genetic effects, is a strength of this study. Researchers who have relied on the standard family environment model in their work are likely to be pleased with these results. Nevertheless, it would be a mistake to conclude that the standard family environment model is "correct" and that the other two models are "wrong." Indeed, all three models are probably necessary to understand children's development, depending on the type of outcome examined.

The present study focused on six behavior problems: repeating a grade, getting in trouble at school, being suspended or expelled from school, having trouble with the police, seeing a doctor or therapist about an emotional or behavioral problem, and being particularly difficult to raise. Although the first item partly taps academic ability, and the item on seeing a doctor or therapist partly taps emotional problems, most of the items focus on externalizing behavior. The current results, therefore, are consistent with those of O'Connor et al. (2000), who found that the associations between parental divorce and children's behavior problems were comparable for adopted and biological children. The O'Connor study also found, however, that the associations between parental divorce and children's school and social adjustment were stronger among biological children than adopted children. Because we did not have measures of school and social adjustment for the children in our sample, it is not possible to compare our findings directly with those of O'Connor. It is possible that some child outcomes, such as the behavior problems we studied, are due largely to the family environment, whereas other outcomes, such as social competence, are affected more strongly by genetic factors. Additional studies that compare samples of adopted and biological children across a range of outcomes are

necessary to determine which child outcomes are primarily responsive to parental behavior and which are primarily affected by parents' genes.

Other studies have provided strong evidence of child effects, with the research literature on parental monitoring being a good example (Crouter and Head 2002; Stattin and Kerr 2000). Although children's misbehavior does not appear to be a major cause of parents' marital distress, children's misbehavior may affect other aspects of parents' behavior, such as their use of harsh discipline or their expressions of warmth. Future studies that model reciprocal effects between parents and children are necessary to distinguish aspects of parent-child interaction that are primarily shaped by children rather than parents. Of course, a good deal of parent-child interaction probably reflects child as well as parent effects. This view is consistent with the position that family dynamics are best represented as a reciprocal process unfolding over time, with each family member adapting to other family members (Maccoby 2003).

A major limitation of this study was its reliance on a relatively small number of adopted children: 120 in the cross-sectional analysis and 50 in the longitudinal analysis. Even in a large sample such as the NSFH, the number of adopted children is modest. The small sample of adopted children (and the corresponding weak statistical power to reject the null hypothesis) would have been a serious problem if we had failed to find significant associations among adopted children. Statistical power was not a problem, however, because the estimated effects of divorce and marital conflict among adopted children were significant. Nevertheless, future data collection efforts that oversample adopted children would make it possible for researchers to parse genetic from environmental effects more effectively.

Another limitation of this study was its focus on a relatively simple version of the genetic model. In particular, we were unable to examine gene-by-environment interactions. Many behavior geneticists believe that environmental factors can activate or deactivate particular genes (Plomin 1994; Reiss et al. 2000). In other words, a genetic predisposition for children to engage in a certain behavior may be expressed in some families but not in others, depending on parental behavior and other environmental circumstances. Relatively few genetically informed studies have attempted to model gene by environment interactions, partly because the typical twin design is not sensitive to interactions (Reiss et al. 2000). Nevertheless, several studies have shown that adopted children with troubled biological parents (for example, parents with substance abuse problems or antisocial traits) are especially likely to exhibit behavior problems if they are reared in unfavorable family environments (Cadoret, Yates, Troughton, Woodworth and Steward 1995).

In conclusion, the present study is one of the first to assess three theoretical models that link parents' marital distress with children's behavior

problems. The analysis provides little support for the passive genetic or the child effects models. Genetic influences on children's behavior are probably common, however, as are children's effects on parents. Nevertheless, in the midst of new perspectives that challenge traditional thinking about the family, we should not forget that the basic premise of socialization theory – that parents influence their children's development, for better or for worse – continues to be a reasonable and useful guide for much research.

Notes

1. A logistic regression analysis revealed that attrition was elevated among blacks, Latinos, fathers, poorly-educated respondents and low-income respondents. Attrition was not related to the adoption status of the child, the child's age, the child's gender, the number of children in the family, the child's behavior problems or the parents' level of marital conflict. Because attrition was not related to the independent or dependent variables, it is unlikely to have affected estimates. For this reason, we did not adjust for attrition in our longitudinal analysis.
2. The amount of missing data for most variables was modest (less than 5 percent of cases). The exception involved spouses' reports of conflict in Waves 1 and 2. For these variables, missing data represented 19 percent and 33 percent of cases, respectively. We used a weighted least squares estimator and the common assumption that missingness was random, conditional on the observed variables, so that cases with full and partial information were included in the analysis.
3. Several alternatives were available for scaling the behavior problem items. In supplementary analyses, we used negative binomial regression, Poisson regression and zero-inflated Poisson regression models (DeMaris 2004). All of these methods yielded results that were substantively the same as the results from the IRT procedure reported in the text.
4. A cross-lagged model is an alternative to the reciprocal (or contemporaneous) effects model in our analysis. A t_2 score with its t_1 equivalent controlled is conceptually similar to a change score. Consequently, a cross-lagged model estimates the effect of a variable measured at t_1 (such as marital conflict) on change in a second variable (such as behavior problems) between t_1 and t_2 . The reciprocal paths model, in contrast, estimates the effects of change on change. When modeling family processes in which individuals or dyads mutually influence one another over time, the contemporaneous model appears to be more appropriate theoretically. Nevertheless, because some readers may be interested in the cross-lagged results, we present these in a subsequent endnote.
5. Cross-lagged models yielded substantive conclusions that were identical to those reported in Table 3. That is, the estimated effect of t_1

marital conflict on t_2 behavior problems was significant ($b = .17$, $SE = .08$, $p < .05$) whereas the estimated effect of t_1 behavior problems on t_2 marital conflict was not ($p > .10$). When we examined biological and adopted children separately, the results were similar to those reported in the text. For biological children, the path from t_1 marital conflict to t_2 behavior problems was significant ($b = .10$, $SE = .02$, $p < .001$). The corresponding path was in the same direction and marginally significant for adopted children ($b = .35$, $SE = .19$, $p = .075$). The estimated effect of t_1 behavior problems on t_2 marital conflict was not significant for biological or adopted children (both $p > .10$).

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