Exhibit J

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The Well-Being of Adolescents in Households With No Biological Parents

On the basis of a large, nationally representative sample of 19,071 American middle-school students, the current study compares adolescents living with neither biological parent with their peers in five other family structures on a wide range of outcome measures. The results reveal some overall disadvantages of living with neither parent, although the disadvantages relative to nontraditional families are limited. Differences in family resources either partially or completely account for outcome differences between non-biological-parent and other family structures. Further, boys and girls in non-biological-parent families appear to fare similarly. Finally, measurement problems and their implications are discussed.

In the past few decades, American families have experienced dramatic structural changes. Consequently, a large number of American children are living in various forms of nontraditional families. Although a substantial amount of family research has carefully examined children's lives in single-parent and stepparent households, much less research attention has been given to children living in households in which both biological parents are absent. Lack of attention to this special group of children is problematic from both theoretical and practical perspectives. Theoretically, households with neither biological parent present (hereafter referred to as non-biological-parent households) provide a unique opportunity for social scientists to examine the crucial roles of biological parents in children's socialization process. Practically, approximately 2.7 million (or 3.7% of all) American children under 18 lived in non-biological-parent households in 1996 (U.S. Census Bureau, 1996). The well-being of such a large subgroup of children merits close investigation.

Using the first wave of the National Education Longitudinal Study of 1988 (NELS), the current study systematically examines various domains of adolescents' lives in non-biological-parent families. Specifically, this study rigorously compares the levels of academic performance, psychological well-being, behavior problems, and deviance among adolescents in non-biological-parent families with those in two-biological-parent, single-mother, single-father, stepmother, and stepfather families. A special effort is made to cross-check and verify students' family structure with information drawn from both student and parent surveys of the NELS. The current study also examines whether variation in child outcomes exists between kin and nonkin households. Furthermore, the study compares the levels of financial, human, cultural, and social resources in various types of households. In such comparisons, efforts are also made to enhance measures of family resources by using only the information provided by the parent or guardian who actually lives with the adolescent. More importantly, the study examines the extent to which differences in family resources ac-

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Key Words: child well-being, family structure, measurement error, non-biological-parent families.

count for possible differences in various child outcomes between non-biological-parent and other families. Finally, the study also elucidates whether boys and girls fare differently in different family structures.

Background

Characteristics of Children in Non-Biological-Parent Families

The U.S. Census Bureau periodically estimates the percentage of children living in non-biological-parent households with its two nationally representative surveys, Current Population Survey (CPS) and Survey of Income and Program Participation (SIPP). On the basis of the latest SIPP estimates, approximately 3.7% (2,645,000) of American children under age 18 lived in non-biological-parent households in 1996. Racial variation is large, ranging from 2.1% to 2.6%, 4.3%, and 7.9% for Asian, White, Hispanic, and African American children, respectively. In addition to race, children's age also appears to be related to the likelihood of living in non-biological-parent households, with children between 15 and 17 years of age more than twice as likely to live in such households as children under 5 years old (6.0% vs. 2.6%). In general, most children in non-biological-parent households live either with grandparents or other relatives or with nonrelative foster guardians. Among all children living with neither parent in 1996, approximately 47.9% lived either with their grandparents only or with grandparents and other relatives, 27.6% lived with relatives other than grandparents, 21.9% lived with nonrelative guardians, and 2.7% had other living arrangements (U.S. Census Bureau, 1996).

The existing studies of foster children have offered several possible reasons why children might live in non-biological-parent households. In addition to the two commonly cited reasons, maltreatment (e.g., abuse, neglect) and death or imprisonment of biological parents, Swingle (2000) suggested two less common ones: economic hardship and voluntary fostering. Historically, sending children to live with other relatives has been a common strategy for poor parents in response to financial crises (Hacsi, 1995). In modern American society, the strategy is used to a lesser extent and is restricted largely to African Americans (Stack, 1974). Further, a small percentage of parents voluntarily send their children to live with relatives so that the children can either attend a good school or stay away temporarily when the parents start a new marriage (Swingle). Although it remains unclear how these different causes are distributed among non-biological-parent homes, it appears that the first two, maltreatment and death/imprisonment of biological parents, occur with greater frequency.

Previous Studies of Life in Non-Biological-Parent Families

Although few studies have systematically studied children in non-biological-parent families in general, a fair volume of social work research sheds light on life in one kind of non-biological-parent household: nonrelative foster families. Overall, these studies have produced consistent findings: Compared with peers not in foster care programs, children in foster care appeared to exhibit more physical health (e.g., Simms, 1991); mental health (e.g., Fanshel & Shinn, 1978); academic (e.g., Fanshel & Shinn, 1978); behavior; and drug-related (Hulsey & White, 1989; Jackson, 1994) problems. Moreover, longitudinal studies have reported that foster youth were more likely to experience educational disruption as a result of changing schools, were less likely to be in a college preparatory track, and were less likely to graduate from high school (e.g., Blome, 1997). Despite their contributions to family research, however, these foster-care studies offer only a limited view of non-biological-parent households, because they leave out children in kinship care, about 75% of all children living with neither parent.

To address this limitation, several recent studies have examined children in kinship families. Using a sample of 524 such children, Dubowitz et al. (1994) reported that, compared with either national norms or peers from parent-present families, children in kinship care appeared to show poorer physical health, mental health (measured by the level of behavior problems), and school achievement (Dubowitz et al.). In a recent study, Jeynes (1999) also reported that children from non-biological-parent households seemed to score lower in academic achievement than peers from both single-parent and two-biological-parent families. Finally, using a pool of CPS data, Swingle (2000) found that kinship households ranked lower than single-father, two-biological-parent, and nonrelative families in economic resources (measured by median household income) and in human

resources (measured by percent of heads of households with a high school degree).

Despite their apparent contributions, almost all previous studies of children in non-biological-parent families suffered from various methodological limitations. Because of the difficulty in sampling non-biological-parent families, most previous studies (with the exceptions of Jeynes, 1999, and Swingle, 2000) used clinical or other nonrepresentative samples, making it difficult to generalize findings to non-biological-parent families in the general population. Furthermore, the comparison groups were inadequately chosen in several cases. For instance, children in non-biological-parent families were compared with either a combined group of peers from a variety of family structures (as in Dubowitz et al., 1994) or with peers in single-parent and two-biological-parent homes (as in Swingle). These investigations did not rigorously assess child well-being in non-biological-parent families because they did not include children from *every* type of family structure as comparison groups. In addition, although some previous studies investigated possible differences within the non-biological-parent family structure by comparing the demographic and financial situations between kinship and nonrelative households, few have rigorously examined various child outcomes between these two non-biological-parent households. Finally, given that most previous studies in this area were conducted by practitioners, few studies have offered any theoretical explanations for the observed differences between non-biological-parent and other families. In short, given these limitations, it is still unclear whether children in non-biological-parent families fare differently in multiple domains of their lives than do peers in all other family structures, and if so, what factors may explain the differences.

Studies of Children in Single-Parent and Stepparent Families

The current study is guided by two theoretical perspectives on children raised in single-parent and stepparent families. The parental absence argument (Amato, 1993) maintains that both biological parents are important socialization agents who provide their children with unique social functions (e.g., emotional support, gender role models, general supervision) and human resources (e.g., parental knowledge and expertise used for tutoring and intellectual guidance). Thus, the physical presence of both biological parents in a household is crucial to the cognitive and social development of children because it ensures a sufficient supply of these important functions and resources. According to this argument, single-parent families, including those in which the parent has never been married, are understaffed when compared with two-biological-parent homes, because the custodial parent is the only provider of such parental resources and functions. Thus children in such homes may fare less well than peers in intact families because the noncustodial parent who is absent in the household typically offers less social contact, support, and supervision. By the same argument, stepparent families also have disadvantages over two-biological-parent families, because stepparents might have responsibilities to former households, which may divert their social and human resources from the stepchildren, and consequently decrease their stepchildren's well-being.

Alternatively, the economic hardship perspective (e.g., McLanahan, 1985) argues that a shortage of economic resources in nontraditional families (particularly in single-mother households) is the primary cause for an elevated level of various problems in such households. Compared with two-biological-parent households, nontraditional families (especially single-mother homes) are likely to have a lower household income (Pong, 1997); fewer educational goods and services (Downey, 1995); and higher chances of living in an economically deprived neighborhood (McLanahan & Booth, 1989). The economic disadvantages associated with nontraditional families may be adversely related to children's educational outcomes, psychological well-being, and social behavior.

A large number of previous studies provide relatively consistent evidence for differences in child well-being among various family structures and offer support for both parental absence and economic hardship hypotheses. Compared with their peers in two-biological-parent families, children from single-parent and stepparent families were likely to do less well on standardized tests, express lower educational aspirations, have lower rates of high school graduation, report a lower level of self-esteem, and exhibit more behavior and drug problems (e.g., Amato & Keith, 1991; Astone & McLanahan, 1991; Downey, 1995; Sun, 2001; Sun & Li, 2002). Further, the levels of economic, human, cultural, and social resources were lower in single-parent and stepparent households than in intact families, as measured by lower levels of income, parental educational attainment,

child participation in highbrow cultural activities, parental supervision, and parent-child communication (e.g., Downey; Harrist & Ainslie, 1998; Sun). The shortages in these family resources appeared to either partially or completely account for the elevated levels of educational, psychological, and behavior problems observed among children in various nontraditional family structures (e.g., Astone & McLanahan; Downey; Harrist & Ainslie; Sun; Thomson, Hanson, & McLanahan, 1994).

Despite previous evidence, several implications of the parental absence and economic hardship arguments remain to be thoroughly investigated. In particular, most previous studies of child well-being in nontraditional families have excluded non-biological-parent families, although this family structure provides a unique opportunity to evaluate both hypotheses. Drawing on the parental absence argument, such families may have a low level of social resources because neither parent is present as a provider. Although other guardians may subsidize some such losses, the extent of such subsidization may be limited. Furthermore, about half of non-biological-parent families are headed by grandparents, who typically have a low level of educational attainment and income (Swingle, 2000). Thus, it is plausible that non-biological-parent families have a shortage of economic and human resources. Because few studies to date have systematically examined the levels of a wide range of family resources in non-biological-parent families, it is still unclear how various family resources are distributed in such households and, more importantly, how such family features may be related to child outcomes.

Another drawback of previous research lies in measurement. Previous studies often measured family structure with information from a single source per household, often from children. This could cause measurement errors in this key variable because even children of middle-school age might not fully understand the complex marital status of their parents (e.g., separation, joint custody), and accordingly might provide inaccurate information. Although some studies measured family structure with parent survey data, few carefully verified whether the respondent to the parent survey was indeed the child's parent. Thus the parent survey might be filled out by visiting grandparents reporting for parents or by visiting parents reporting for guardians. In both cases, errors are likely to be introduced in reporting household structure and economic, human, and social resources. In short, to rigorously test both the parental absence and economic hardship hypotheses, it is crucial to reduce measurement errors by verifying family structure information from multiple sources and by assessing the resources provided by parents/guardians who actually live with children.

Finally, previous studies in the area are also inconclusive about gender differences in nontraditional families. Whereas some studies (e.g., Block, Block, & Gherde, 1986; Cherlin et al., 1991) have suggested that girls fare better than boys in nontraditional families, others have failed to find such gender differences (e.g., Allison & Furstenberg, 1989; Sun, 2001). Because none of these previous studies included children in non-biological-parent households, it is still unclear whether boys and girls fare differently in such families relative to peers in other family structures.

Present Study

The present study addresses several limitations of the previous research. First, using a large, nationally representative sample of American middle-school students, this study compares the well-being of children in non-biological-parent families with that of their peers in single-mother, single-father, stepmother, stepfather, and two-biological-parent households. With indicators that measure four domains of adolescents' lives, I am able to examine the prevalence and the magnitude of potential differences in these areas between non-biological-parent families and each of the five comparison groups.

Second, the present study also examines possible variations in child well-being within the non-biological-parent family structure. Although it is conceptually sound to treat non-biological-parent families as one type of family structure, it is possible that children living with relatives may respond to their living environment differently than children in nonrelative foster care. By further classifying children into kinship and nonrelative households, I am able to examine whether there is variation in child outcomes between these two non-biological-parent homes. If the analysis finds no such variations, it further endorses the conceptualization of non-biological-parent homes as one type of family structure.

Third, the study also tests the parental absence and economic hardship hypotheses by assessing whether non-biological-parent households have

the same level of family resources as do other types of households, and whether such differences in family resources account for differences in outcomes among various family forms. In contrast to the study by Jeynes (1999), which used socioeconomic status (SES) as the only mediating factor, I am able to incorporate a wide range of measures of financial, human, cultural, and social resources in the analyses. Given that non-biological-parent families may indeed have the lowest level of various family resources, this analysis provides a unique opportunity to elucidate the extent to which various resources may be responsible for outcome differences.

Fourth, drawing on previous findings regarding gender differences in nontraditional families, the current study also investigates whether boys and girls respond differently to the non-biological-parent family structure. Because boys and girls may differ in their adjustment to changes in family environment (Zaslow & Hayes, 1986), and because the non-biological-parent environment is different from traditional living arrangements, it is possible that potential gender differences in various family forms may be clarified when non-biological-parent households are compared with each of the other five family forms.

Finally, this study is also able to reduce measurement error by including only cases in which parents/guardians and students *agree* on family structure and by including cases in which respondents to the parent survey actually lived with the student.

In later statistical analyses that answer these research questions, I control for the student's gender, race/ethnicity, school affiliation, and residential location. Each of these variables has been reported in previous research as being related to the likelihood of living in nontraditional families, levels of parental resources, and child outcomes (e.g., Astone & McLanahan, 1991; Downey, 1995; White, 1990).

Method

Sample

Data for this study came from the base year of the NELS, a nationally representative sample of eighth graders collected by the National Center for Education Statistics. The NELS used a two-staged probability sampling procedure, which first selected a sample of schools, and then, within each school, a subsample of students. The original sample comprised over 24,000 eighth-grade students studying in over 1,000 public and private schools. I chose to use the base-year (1988) data because only this wave of the NELS contained information about family structure from both students and parents.

To enhance the measure of family structure, I used a set of sampling filters to select the final sample. On the basis of the student survey, the NELS constructed a family structure measure (two-biological-parent, single-mother, single-father, stepmother, stepfather, and non-biological-parent). I cross-checked this student-reported measure with four parent-survey variables: respondent's relationship with the student, the spouse or partner's relationship with the student, respondent's marital status, and the amount of time the respondent lived with the student. The final sample included all students in the base-year pool who (a) had no missing values on any of the five variables mentioned above, (b) had a valid value on at least one dependent variable, and (c) had a parent or guardian whose responses to the four parent-survey questions *matched* the student-reported family structure, as specified in Table 1. For example, although a student reported living with two biological parents, the case was only included and coded as two-biological-parent when one biological parent (a) self-identified as the parent, (b) reported to be married, (c) had a spouse who was the other biological parent, and (d) lived with the student more than half or all of the time (see Table 1). Similarly, non-biological-parent families were identified and included when the student reported living *only* with a non-biological-parent guardian(s) and when a non-biological-parent guardian (a) responded to the parent survey, (b) reported having either none or another non-biological parent as spouse or partner, and (c) reported living with the student more than half or all of the time. Students from the other four family structures were screened and included in a similar manner. After screening through these filters, the final sample contained 19,071 students who lived in six types of households: two-biological-parent (n = 13,376); single-mother with no cohabiting male partner (n = 2,788); biological mother and stepfather or male partner (n = 1,805); single-father with no cohabiting female partner (n = 335); biological father and stepmother or female partner (n = 413); and non-biological-parent households (n = 354). Among the 354 non-biological-parent cases, 265 (74.9%) lived with grandparents or relatives, whereas 89 (25.1%)

TABLE 1. CRITERIA USED TO SELECT FINAL SAMPLE

Student-Reported Family Structure	Criteria Used for Verification on the Basis of Parent Survey Items				Final Sample With All Matching Student and Parent Information	
	Respondent's Relationship With Student	Spouse/Partner's Relationship With Student	Respondent's Marital Status	Amount of Time Living With Student	*N*	Weighted %
Two biological parents	Mother or father	Father or mother	Married	More than half or all the time	13,376	68.46
Single mother	Mother	No spouse/partner	Divorced, single, widowed, or never married	More than half or all the time	2,788	15.05
Mother and stepfather/male partner	Mother or stepfather/male partner	Stepfather/male partner or mother	Any value	More than half or all the time	1,805	10.32
Single father	Father	No spouse/partner	Divorced, single, widowed, or never married	More than half or all the time	335	1.80
Father and stepmother/female partner	Father or stepmother/female partner	Stepmother/female partner or father	Any value	More than half or all the time	413	2.39
Nonbiological parent	Nonparent guardian	Nonparent guardian	Any value	More than half or all the time	354	1.98
Total					19,071	100.0

Note: From the National Education Longitudinal Study (1988).

lived with nonrelative guardians. Except for nonrelative households, it is possible for other adult relatives to live in all households. Sampling weights provided in the NELS were used in all later statistical analyses in order to adjust for unequal probabilities among the selected schools and overrepresentation of minority students in the sample.

As illustrated in Table 2, 2,367 cases (11% of the original pool) were excluded from the final sample because student and parent data did not match. The majority (1,707 students, or 72.1%) of these cases were excluded as a result of obvious measurement errors. Table 2 illustrates the three most common measurement errors for each family structure. For instance, although 226 students reported living with both biological parents, their mothers reported that they were married to the student's stepfather (Error Type A in two-biological-parent families). Similarly, the information provided by 12 fathers who reported being married to the student's mother and living with the student more than half or all of the time contradicted the student's report of living in a single-mother household (Error Type C in this group). In non-biological-parent households, all three common errors were spotted when the student's mother claimed to live with the student more than half or all of the time. Other than these obvious discrepancies, I also excluded 660 cases (under the unable to decide category in Table 2) because the parent survey information was insufficient to verify the student's family structure, particularly in the single-mother category. For instance, the parent-survey information provided by a relative who did not live with the student did not allow a crosscheck of any student's living arrangement. Among these cases, there were 44 families in which all measures from students and parents match except that the biological parents were cohabiting. Although these families had two biological parents present at the time of the survey, the possibility that these parents might have cohabited only intermittently throughout the eighth grader's life (for about 14 years) cannot be entirely excluded. Furthermore, it is possible that these parents differ from their peers in the traditional intact families in family values and levels of commitment to the relationship. To avoid possible confounding effects, these special cases were excluded from the current study.

Measures

Outcome variables. To reduce the number of outcome variables included, I conducted a factor analysis of a large number of outcome measures from the student survey. On the basis of such analysis, six single- and multi-item measures were

TABLE 2. INFORMATION ON EXCLUDED CASES AND EXAMPLES OF MEASUREMENT ERRORS

Student-Reported Family Structure	Cases Excluded Because of Discrepancy Between Student and Parent Surveys: Total	Unable to Judge *N* (%)	Measure Errors *N* (%)	Examples of Three Most Common Measurement Errors on the Basis of Parent Survey Information[a]: Error Type	Respondent's Relationship With Student	Partner's Relationship With Student	Respondent's Marital Status	*N*
Two biological parents	814	114 (14.0)	700 (86.0)	(a)	Mother	Stepfather	Married	226
				(b)	Mother	No spouse	Single	71
				(c)	Mother	No spouse	Divorced	52
Single mother	493	323 (65.5)	170 (34.5)	(a)	Mother	Father	Married	83
				(b)	Mother	Stepfather	Married	60
				(c)	Father	Mother	Married	12
Mother and stepfather/male partner	494	68 (13.8)	426 (86.2)	(a)	Mother	No spouse	Divorced	143
				(b)	Mother	Father	Married	133
				(c)	Mother	No spouse	Single	53
Single father	192	79 (41.1)	113 (58.9)	(a)	Mother	Father	Married	48
				(b)	Father	Mother	Married	26
				(c)	Mother	Stepfather	Married	10
Father and stepmother/female partner	95	30 (31.6)	65 (68.4)	(a)	Father	No spouse	Divorced	16
				(b)	Mother	Father	Married	15
				(c)	Father	Mother	Married	14
Nonbiological parent	279	46 (16.5)	233 (83.5)	(a)	Mother	Father	Married	76
				(b)	Mother	No spouse	Divorced	44
				(c)	Mother	Stepfather	Married	25
Total	2367	660 (27.9)	1,707 (72.1)					

Note: From the National Education Longitudinal Study (1988).
[a]In all examples, parents reported living with students more than half or all of the time.

constructed to gauge students' well-being in four life domains. For academic performance and aspiration, I first constructed a four-item composite of *academic performance* ($\alpha = .91$) by taking the average of the four standard cognitive test scores in mathematics, reading, science, and social studies. Students' *educational aspiration* was measured by asking students, "As things stand now, how far in school do you think you will get?" (1 = *less than high school graduation,* 6 = *graduate school*).

For students' psychological well-being, the NELS asked students to respond to seven statements regarding their self-esteem (e.g., I feel good about myself; I am able to do things as well as most other people). Another six statements measured the levels of students' generalized locus of control (e.g., I don't have control over the direction my life is taking; In my life, good luck is more important than hard work for success). In all these psychological items, responses were coded from 1 to 4 where 1 = *strongly disagree* and 4 = *strongly agree.* With these items, I constructed two composites, *self-esteem* ($\alpha = .79$) and *locus of control* ($\alpha = .68$), by taking the averages of the seven self-esteem items and six locus of control measures, respectively.

To measure students' behavior problems at school, the survey asked students how often any of the following had happened to them during the first semester of the current school year: (a) student sent to office for misbehaving, (b) parent received warnings for student's attendance, (c) parent received warning about student's behavior, and (d) student got into a physical fight with another student. All four items were coded as 0 = *never,* 1 = *once or twice,* and 2 = *more than twice.* With these variables, I created a composite of *behavior problems* ($\alpha = .71$) by averaging the four items. Finally, I included *the number of cigarettes smoked per day* (0 = *none,* 4 = *two packs or more per day*) as a proxy measure of deviant behavior.

Predictor variables. The key predictor variable was family structure. As mentioned earlier, I created the measure by cross-checking data from students and parents. Five dummy variables were created to code the statuses of two-biological-parent, single-mother, single-father, stepmother, and

stepfather households, with non-biological-parent households serving as the reference group. To allow a separate investigation of possible variation within non-biological-parent family structure, I further created a dummy variable, kinship household (1 = *students living with grandparents or relatives,* 0 = *students living in nonrelative families*). Because the data set does not contain information about adoption, the current study was unable to separate adopted children from other adolescents in the sample.

Intervening variables. To examine the mediating effects of family resources, I included measures of economic, human, cultural, and social resources, all taken from the parent survey. Because the NELS data set does not provide a reliable measure of family size, particularly for non-biological-parent households, I used gross family annual income (rather than per capita income) reported by the parent or guardian to assess the economic situation in which the student lived. Income was measured in 15 intervals and the variable was converted into a continuous measure in units of $10,000 by taking the midpoint of each interval. To measure human resources, I included the parent's or guardian's *educational attainment* (1 = *less than eighth grade,* 13 = *doctoral degree*) and *occupational prestige* (gauged by the index in the data). The latter was used because occupations with high prestige typically require high levels of human skills and knowledge. Different coding was used for various family structures to assess such resources accurately. For single-mother and single-father households, I used the educational attainment and occupational prestige of the custodial parent. For the other four family types, attainment and prestige of the parent or of the spouse or partner, whichever were higher, were used.

For cultural resources, the survey asked the parent whether the eighth grader had ever gone to (a) a musical concert, (b) an art museum, (c) a science museum, and (d) a history museum (0 = *no,* 1 = *yes*). I created a composite of *cultural activities* (α = .74) by averaging these four items.

For social resources, I first used the parent's or guardian's *educational expectation* for the student (1 = *less than high school,* 12 = *doctoral degree*) as a proxy measure, because the measure reflects the extent to which parents or guardians care about, and thus pressure, the adolescent for future educational success. A parent was also asked about how frequently the parent and/or the spouse or partner talked with the student about (a) school experiences, (b) plans for high school, and (c) plans after high school (0 = *not at all,* 1 = *rarely,* 2 = *occasionally,* 3 = *regularly*). The responses to these three items were averaged to create the composite of *parent-child discussion* (α = .72). Drawing on Coleman's notion of social capital (Coleman, 1988), I also used *number of other parents* known by the parent or guardian and *school involvement,* both gauging the social investment of a parent or guardian in relationship with other parents and school personnel. School involvement was a five-item composite (α = .73), averaging parents' or guardians' reports on whether they (a) belonged to parent-teacher organizations (PTO), (b) attended PTO meetings, (c) participated in other PTO activities, (d) volunteered in school, and (e) belonged to other organizations with other parents (0 = *no,* 1 = *yes*).

Control variables. Control variables included the student's sex; race or ethnicity (Asian, Hispanic, African American, American Indian, and non-Hispanic White); school affiliation (public, Catholic, other religious, and nonreligious private); and residential location (urban, suburban, and rural).

Missing Value Strategies

Given the sampling procedure used in this study, no students had missing values on family structure. Except for race or ethnicity, the control variables also contained no missing values. To save the cases with missing values on race (less than 1% of the total sample), I coded a separate value on this variable. Thus, the tests of outcome differences by family structure used all cases in the sample. In later analyses of mediating effects, however, missing values were observable on eight resource variables. Preliminary analyses indicated that 3,337 cases (17.5%) had missing values on at least one resource variable, and therefore would be dropped by list-wise deletion when all resource variables were included in a regression analysis. To avoid such loss of cases, I used Rubin's multiple imputation technique (MI) in this study (for a detailed discussion of MI, see Rubin, 1987; Schafer & Olsen, 1998). The MI procedure replaced each missing value on a given variable with a set of $m > 1$ maximum-likelihood estimates drawn from their predictive distributions on the basis of nonmissing values of all related variables. Specifically, I included all the dependent, independent, intervening, and control variables in

the imputation model, although only missing values on the eight resource measures were imputed. Given that each resource variable had less than 10% missing values, I chose to impute 10 (m = 10) estimates for each missing value, because 10 estimates gave at least 99% of efficiency of estimation (see Schafer & Olsen). In later analyses of intervening effects, I estimated each coefficient and its standard error 10 times with 10 different imputed data sets and reported a summary coefficient and standard error (presented in tests of significance) using Rubin's formulae.

Test of Significance

In this study, I compared differences in adolescent outcomes and family resources between non-biological-parent families and those in two-biological-parent families and each of the four nontraditional families. Because the numbers of cases in non-biological-parent and each of the four nontraditional families were moderate (ranging from 335 in single-father to 2,788 in single-mother homes), $p < .05$ was appropriate for determining statistical significance. When I turned to comparisons with two-biological-parent families, however, the number of cases used exceeded 13,000. Such a large sample was likely to result in statistical significance for substantively small effects. Thus, for comparisons of non-biological-parent and two-biological-parent homes and for regression coefficients of family resources, I reported the coefficients as significant at the $p < .01$ level.

Results

Descriptive Analyses of Sample Representation

Before answering the research questions raised in this study, I first compared the distribution of the non-biological-parent households in the sample with that estimated by CPS in 1988 (SIPP data were unavailable for this particular year). On the basis of the CPS estimates, the percentages of children under 18 in non-biological-parent families were 3.0, 2.2, 7.4, and 3.6 for all children, non-Hispanic Whites, African Americans, and Hispanics, respectively, whereas the weighted percentages for the corresponding groups in the current sample were 2.0, 1.3, 6.4, and 2.0, respectively. Thus, by a relatively small margin, the current sample had a lower estimate than CPS for each category, ranging from 0.9% for non-Hispanic Whites to 1.6% for Hispanic children. Further, CPS estimated that, among those who lived with neither parent in 1988, 79.5% lived in kinship households and 20.5% in nonrelative homes. The percentages for the same living arrangements in the current sample were 74.9% and 25.1%. These discrepancies were likely to be caused by sampling errors in both CPS and the NELS and/or by age differences in the two studies. Because CPS does not contain age-specific distributions of family structure, I assume that the current NELS sample was nationally representative of all eighth graders in the 1987–1988 school year.

Differences in Adolescent Well-Being

I began the investigation by answering the following question: Do adolescents in non-biological-parent families fare differently in the four outcome areas than their peers in other types of families? Among several statistical methods available to address this question, seemingly unrelated regression (SUR) technique might be preferred because it takes into account that errors are likely to be correlated when analyzing correlated dependent variables. In the current analysis, however, SUR does not offer this advantage because the independent variables used for all six dependent variables were identical in each model. Thus I used the multiple regression technique instead and regressed each of the six well-being indicators on the five dummy family structure measures and the four control variables. Because the NELS used a two-stage cluster sampling design, with students nested within schools, the SURVEYREG procedure with the cluster option in SAS (SAS Institute Inc., Cary, NC) was used to correct the standard errors associated with cluster design and sample weights. Table 3 illustrates the results of these analyses.

The results summarized in Table 3 clearly revealed a moderate disadvantage of living in non-biological-parent families. When compared with peers from the other five types of families in the six outcome measures, adolescents from non-biological-parent families fared less well in 24 of 30 comparisons, even after demographic factors were held constant. Although some of these 24 effects might be significant by chance as a result of a large number of tests having been conducted, the fact that 80% of these effects were significant suggested an overall lower level of well-being among adolescents living with neither parent. The prevalence and magnitude of these non-biological-parent effects, however, appeared to vary by

TABLE 3. UNSTANDARDIZED REGRESSION COEFFICIENTS (STANDARD ERRORS) FROM REGRESSIONS OF WELL-BEING INDICATORS ON FAMILY STRUCTURE AND CONTROLS

	Adolescent Well-Being					
Independent Variables	Academic Performance	Educational Aspiration	Locus of Control	Self-Esteem	Behavior Problems	No. of Cigarettes Per Day
Two biological parents	3.43***	.43***	.14***	.15***	−.18***	−.15***
	(.43)	(.08)	(.03)	(.03)	(.03)	(.04)
Single mother	1.89***	.21*	.08*	.10***	−.08**	−.07*
	(.45)	(.09)	(.03)	(.03)	(.03)	(.04)
Stepfather/male partner	1.77***	.27**	.08*	.08*	−.07**	−.07*
	(.48)	(.09)	(.03)	(.03)	(.03)	(.04)
Single father	1.81**	.24*	.10*	.07	−.05	−.06
	(.69)	(.11)	(.04)	(.04)	(.04)	(.05)
Stepmother/female partner	1.38*	.21*	.08*	.04	−.05	−.03
	(.59)	(.10)	(.04)	(.04)	(.04)	(.05)
Nonbiological parent	.00	.00	.00	.00	.00	.00
N	18,530	18,983	18,994	18,998	18,874	18,768
R^2	.12	.04	.02	.05	.11	.02

Note: Control variables used in the analyses included student's gender, race, geographic location of the residence, and school affiliation. From the National Educational Longitudinal Study (1988).
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed tests).

family type. When compared with their peers from two-biological-parent families, students from non-biological-parent families fared less well in all six outcomes: They scored lower in academic performance, educational aspiration, locus of control, and self-esteem, and exhibited more behavior and deviance problems. Judging by the standard deviation (*SD*) of each outcome variable (not shown, available upon request), these non-biological-parent effects were moderate, ranging from .29 to .46 *SD*. By contrast, although the non-biological-parent effects relative to single-mother and to stepfather families were observable in all six well-being indicators, the magnitudes were small, ranging from .16 to .21 *SD*. These effects were about half as large as those relative to two-biological-parent families. Finally, the differences in adolescent outcomes between non-biological-parent families and single-father and stepmother families were limited both in number and magnitude. When compared with peers in single-father and stepmother households, students living with neither parent scored at the same level in self-esteem, behavior problems, and cigarette smoking, whereas they averaged only slightly lower (by about .15–.20 *SD*) in academic performance, educational aspiration, and locus of control.

If adolescents in non-biological-parent families fare less well in most outcome measures than most comparison groups, were there variations in outcomes between kinship and nonrelative families? To answer this question, I used the subsample of non-biological-parent families and regressed each outcome variable on the dummy variable of kinship household and the demographic controls (nonrelative family structure was the reference group). Of the six pairs of adjusted group means compared, none was statistically significant, suggesting that there was little variation in outcomes between children in kinship and foster care. Given this finding, I continued to treat all non-biological-parent families as one group in later analyses of intervening effects.

In summary, the analyses in this section suggested that overall, adolescents in non-biological-parent families appeared to fare less well than peers in other types of families. In general, differences between non-biological-parent and two-biological-parent homes were moderate in size, and those between non-biological-parent and other nontraditional families were small (all below .3 *SD*). Interestingly, adolescents living with neither parent were similar in self-esteem, behavior, and smoking problems to students in two types of families with no biological mothers (single-father and stepmother families). Finally, there appeared to be no variation in child outcomes between kinship and nonrelative households.

Intervening Effects of Family Resources

Given outcome differences between non-biological-parent and other families, I proceeded to the next question: Do non-biological-parent families

TABLE 4. UNSTANDARDIZED REGRESSION COEFFICIENTS (STANDARD ERRORS) FROM REGRESSIONS OF FAMILY RESOURCE INDICATORS ON FAMILY STRUCTURE AND CONTROLS

	Family Resources				
Independent Variables	Annual Income ($10,000)	Parent's Educational Attainment	Parent's Occupation Prestige	Cultural Activities	Parent-Child Discussion
Two biological parents	1.68***	2.05***	9.66***	.13***	.19***
	(.15)	(.21)	(1.36)	(.02)	(.04)
Single mother	−.80***	.58**	3.89**	.08**	.12**
	(.14)	(.22)	(1.42)	(.02)	(.04)
Stepfather/male partner	1.00***	1.63***	6.80***	.09***	.17***
	(.16)	(.22)	(1.45)	(.03)	(.04)
Single father	.59*	1.57***	−1.00	.06*	<.01
	(.24)	(.30)	(1.83)	(.03)	(.05)
Stepmother/female partner	1.52***	1.77***	8.19***	.03	.01
	(.23)	(.28)	(1.87)	(.03)	(.05)
Nonbiological parent	.00	.00	.00	.00	.00
N	18,300	19,046	18,445	18,561	19,053
R^2	.19	.13	.10	.04	.02

Note: Control variables used in the analyses included student's gender, race, geographic location of the residence, and school affiliation. From the National Education Longitudinal Study (1988).
*$p < .05$. **$p < .01$. ***$p < .001$ (two-tailed tests).

have the same levels of family resources as other types of families? To this end, I regressed all family resource measures on family structure and demographic controls. Table 4 summarizes the results of these analyses.

As illustrated in Table 4, non-biological-parent families were clearly disadvantaged in all family resources when compared with two-biological-parent households. For instance, the annual household income in non-biological-parent families was lower by about $16,800 (.39 *SD*), whereas parents' educational attainment and occupational prestige were lower by two attainment levels (.59 *SD*) and 9.66 points (.47 *SD*). Similarly, compared with counterparts in two-biological-parent homes, guardians in non-biological-parent families talked less to students, had lower expectations, were less involved in school-related activities, knew fewer other parents, and reported a lower level of student participation in cultural activities (the differences ranged from .35 to .42 *SD*). Also, non-biological-parent families scored lower in all eight resource items when compared with stepfather households and in six items when compared with single-mother families, with these differences ranging from small to moderate (from .13 to .47 *SD*). By contrast, resource differences between non-biological-parent homes and the two types of mother-absent (single-father and stepmother) homes were limited in scope. Specifically, stepmother households scored somewhat higher in household income, parent's educational attainment, and occupational prestige (all three differences were above .3 *SD*), but at the same level as non-biological-parent homes in all cultural and social resources. Similarly, single-father households ranked higher in income, parent's educational attainment, parent's expectations, and cultural resources, but scored at the same level as non-biological-parent homes in parent's occupational prestige, parent-child discussion, school involvement, and number of other parents known. Compared with the two types of mother-absent homes, non-biological-parent families scored at the same level in three social resource indicators (parent-child discussion, school involvement, and number of parents known), all of which are typically provided by a mother.

Given that both child well-being and family resources were associated with family structure, would the differences in family resources mediate the differences in outcomes between non-biological-parent and other control groups? To address this, I regressed all well-being measures on family structure, demographic controls, and all resource measures. Table 5 illustrates the results.

Overall, family resources appeared to be very effective mediators: They completely accounted for 20 of 24 (83.3%) significant group differences between non-biological-parent and other types of families in various outcomes and reduced the remaining four effects by a range of 20% to 40%. In particular, differences in resource measures appeared to be completely responsible for the dif-

TABLE 4. EXTENDED

Family Resources		
Parent's Expectation	School Involvement	No. of Parents Known
1.16***	.13***	.63***
(.19)	(.02)	(.11)
.76***	.02	.38***
(.19)	(.02)	(.11)
.76***	.04*	.25*
(.20)	(.02)	(.11)
.79**	−.03	−.02
(.26)	(.02)	(.15)
.18	− .01	− .18
(.24)	(.02)	(.14)
.00	.00	.00
18,995	18,656	16,856
.05	.12	.08

ferences in outcomes between non-biological-parent and each of the following three family groups: single-father, stepmother, and stepfather. Similarly, family resources completely explained five of six outcome differences between non-biological-parent and single-mother families and reduced the difference in self-esteem from .10 to .07, a reduction of 30.0%. Finally, differences in resources also completely accounted for the differences between non-biological-parent and two-biological-parent families in academic performance, educational aspiration, and locus of control, and reduced the differences in self-esteem, behavior problems, and cigarette smoking.

In summary, the analyses in this section suggested that differences in outcomes between non-biological-parent students and their peers in other family structures were either completely or partially attributable to differences in various family resources among family forms.

Interaction Effects of Family Structure and Gender

Finally, I tested whether boys and girls fare at the same level in the non-biological-parent homes relative to their peers in other families. To this end, I regressed each outcome variable on family structure, resources, controls, and five interaction terms (gender × each of the five family structure dummy measures). Therefore, a total of 30 (5 × 6) interaction terms were tested in six separate runs.

Of the 30 interactions tested, one (3%) was statistically significant. Specifically, girls living with neither parent had a lower locus of control than boys when compared with their respective peers in single-mother families. Given the large number of interaction effects tested, the single significant interaction effect might be significant by chance. In short, the interaction analysis suggested that boys and girls in non-biological-parent households had approximately the same levels of well-being relative to their counterparts in other types of families.

DISCUSSION

Although a substantial amount of family research has examined lives in single-parent and stepparent households, children living with neither biological parent remain an understudied group. This study contributes to the existing literature by examining the educational, psychological, and behavioral outcomes of children in non-biological-parent homes and by elucidating the extent to which family resources in various types of families mediate outcome differences.

My analyses have clearly demonstrated some overall disadvantages of living with neither parent. Among adolescents from all six family types, those in non-biological-parent families appear to rank the lowest in academic performance, educational aspiration, and locus of control. Further, they appear to fare less well in the remaining outcome areas (self-esteem, behavior problems, and cigarette smoking) than children from two-biological-parent, single-mother, and stepfather families. In general, these findings seem to suggest that non-biological-parent households provide a somewhat less favorable family environment for children to live in.

Despite these overall disadvantages of living in non-biological-parent homes, two related trends regarding the magnitude and prevalence of these disadvantages deserve more discussion. First, the non-biological-parent effects relative to other nontraditional families are only about half of the size of those relative to two-biological-parent families. This finding seems to suggest that the effect of parental absence is additive, with each additional biological parent absent in the household being related to a limited decline in child well-being. Given that children in non-biological-parent homes may have indeed experienced more traumatic events than children in other nontraditional families, this finding of small outcome differences between non-biological-parent and other nontraditional families is notable. Second, in self-es-

TABLE 5. UNSTANDARDIZED REGRESSION COEFFICIENTS (STANDARD ERRORS) FROM REGRESSIONS OF WELL-BEING INDICATORS ON FAMILY STRUCTURE, CONTROLS, AND FAMILY RESOURCES

	Adolescent Well-Being						
Independent Variables	Academic Performance	Educational Aspiration	Locus of Control	Self-Esteem	Behavior Problems	No. of Cigarettes Per Day	No. of Non-Biological-Parent Effects Completely Explained
Two biological parents	.79	−.01	.06	.09**	−.13***	−.12***	3/6
	(.42)	(.08)	(.03)	(.03)	(.03)	(.04)	
Single mother	.85	.01	.04	.07*	−.05	−.05	5/6
	(.43)	(.08)	(.03)	(.03)	(.03)	(.04)	
Stepfather/male partner	−.03	−.03	.03	.04	−.05	−.05	6/6
	(.46)	(.08)	(.03)	(.03)	(.03)	(.04)	
Single father	.14	−.01	.07	.04	−.02	−.04	3/3
	(.63)	(.10)	(.04)	(.04)	(.04)	(.04)	
Stepmother/female partner	.01	.04	.06	.03	−.03	−.03	3/3
	(.58)	(.10)	(.04)	(.04)	(.04)	(.05)	
Annual income	.15***	.02***	.01**	.01	<.01	<.01	
	(.02)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	
Parent's educational attainment	.45***	.05***	<.01	<.01	−.01**	<.01	
	(.03)	(<.01)	(<.01)	(<.01)	(<.01)	(.01)	
Parent's occupational prestige	.02***	<.01***	<.01	<.01	−.01	<.01	
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	
Cultural activities	1.72***	.15***	.06***	.06***	−.03**	−.02	
	(.19)	(.03)	(.01)	(.01)	(<.01)	(.01)	
Parent-child discussion	−.73***	.10***	.05***	.06***	.01	.01	
	(.12)	(.02)	(.01)	(.01)	(.01)	(.01)	
Parent's expectation	.93***	.19***	.03***	.02***	−.02***	−.02***	
	(.03)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	
School involvement	.07	.03	.02	.04**	−.02	−.02	
	(.24)	(.03)	(.01)	(.01)	(.01)	(.01)	
No. of parents known	.07	.01	.01***	.01**	<.01	−.01	
	(.05)	(.01)	(<.01)	(<.01)	(<.01)	(<.01)	
N	18,530	18,983	18,994	18,998	18,874	18,768	
R^2	.32	.33	.08	.08	.14	.03	

Note: Control variables used in the analyses included student's gender, race, geographic location of the residence, and school affiliation. From the National Education Longitudinal Study (1988).

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

teem, behavior, and cigarette smoking, students in non-biological-parent homes fare at the same level as peers in the two kinds of mother-absent households. One possible explanation is that mothers and fathers play different parenting roles in children's socialization processes. Whereas mothers are more likely to fill daily care to children and be involved in school-related activities, fathers are more likely to fill the roles of playmate and advisor (for a review, see Thompson & Walker, 1989). Consistent with this argument, the present study finds that non-biological-parent households score as low as single-father and stepmother households in most social resource measures (e.g., parent-child discussion, involvement in school) typically provided by mothers. Thus it is possible that the shortage of these and other maternal roles and functions in these three types of mother-absent families decreases children's self-esteem and increases their behavior problems. In short, although the present findings clearly underscore the importance of the physical presence of biological parents in the household, the overall disadvantages of living in non-biological-parent over nontraditional households are limited.

Interestingly, the current study finds no differences in student outcomes between kinship care and nonrelative care. The parental absence argument offers one possible explanation for this lack of variation. It is possible that certain parental roles and functions are crucial to children. Thus the absence of such roles should lead to approximately the same levels of outcomes among children in various forms of non-biological-parent environments. A related possibility is that children in both kinship and foster care are likely to be exposed to similar traumatic events prior to placement. Therefore, it is not surprising to find that they exhibit relatively similar responses to these crises.

The current study also identifies various family resources as important mechanisms that explain outcome differences between non-biological-parent and other control groups. Compared with two-biological-parent and stepfather families, non-biological-parent households are clearly disadvantaged in each of the eight resource measures. With the exception of family income and school involvement, non-biological-parent families also possess a lower level of other family resources as compared with single-mother households. When compared with two kinds of families with no biological mothers (single-father and stepmother families), however, non-biological-parent families appear to have a lower level of family income and educational attainment, but score at the same level as these families in most social resources. These differences in various family resources account for 20 of 24 non-biological-parent effects on various outcome measures and reduce a moderate portion of the remaining effects. These findings suggest that the observed non-biological-parent effects relative to other types of families are either completely or partially attributable to resource differences among these family structures. Overall, these findings are highly consistent with previous studies on single-parent and stepparent households and provide strong support for both parental absence and economic hardship arguments.

Finally, the current study also finds that boys and girls seem to fare at the same level in the non-biological-parent environment. This finding appears to contradict several previous divorce studies (e.g., Block et al., 1986) that report fewer adjustment problems for girls than for boys. One possible explanation for such different findings may lie in family structure. As mentioned earlier, children in non-biological-parent households have presumably experienced more unpleasant events prior to and during placement than their peers in other types of nontraditional families. Thus, whereas girls in other types of nontraditional families might be more resilient to life events such as parental divorce than boys, such resilience may fade as girls in non-biological-parent families face the challenge of adjusting to an uncommon family arrangement.

Several limitations of the present study are noted. The NELS data do not allow an examination of important mediating factors other than resources. For instance, non-biological-parent children are likely to exhibit a high level of stress associated with their experiences of traumatic events and changes in family arrangements. Unfortunately, the NELS data contain no such information. Also, the measurement of financial resources has limitations. Although the current strategy to measure the financial situation of the care provider attempts to assess the actual amount of resources to which children have access in most non-biological-parent families, some parents who send their children to live with relatives might make special financial arrangements with the care provider. Thus, future studies may use surveys specially designed for non-biological-parent families to assess financial and other resources accurately and to explore how factors other than family re-

sources might contribute to children's maladjustment in such homes.

Although the current study carefully verifies the measure of family structure, the data set does not contain information about causes of placement and the duration of stay in non-biological-parent households. Lack of information about these two characteristics may confound the current findings to some extent. For instance, some adolescents who have just moved into their current non-biological-parent environment may exhibit initial negative effects, whereas others who have lived in such an environment for a long period may have adjusted. Furthermore, some parents might deliberately send their children to live with relatives so that children can live in a better school district or economic environment. In these special cases, living in non-biological-parent homes might actually improve children's well-being. To sort out these confounding effects, it would be ideal to use longitudinal data that measure child outcomes both before and after a child moves into a non-biological-parent household and to control for various reasons for this living arrangement. Whenever data permit, future studies can investigate how placement into non-biological-parent environment and length of stay in such households may be related to changes in child outcomes.

Finally, the data analyzed here were collected in 1988. According to CPS, the percentage of children living in non-biological-parent households has increased from 3.1% to 4.2% from 1988 to 2000. A variety of explanations have been offered for this increase. Swingle (2000) has suggested that requirements in the new welfare-to-work programs may have encouraged parents to send their children to live with relatives in order to meet work requirements. Alternatively, Minkler (1998) has argued that the growth in young-adult drug use, mental problems, and nonmarital childbearing has increased children's chances of living with grandparents. In any case, a growing number of children living apart from both parents suggest that research on this household type is of increasing importance. It will be useful to examine more current data to determine whether patterns of resources and outcomes identified in this study continue to characterize such households.

In summary, the current study demonstrates that non-biological-parent family structure provides a valuable opportunity for family researchers to evaluate the importance of parental functions and resources in children's academic and psychological development. The findings point out various disadvantages of living in non-biological-parent households, identify the shortage of parental functions and resources as a major mechanism associated with a lower level of well-being in such homes, and provide empirical support to parental absence and economic hardship hypotheses. Through these findings, the study highlights the importance of including this special group of children in future family research.

Methodologically, the current study demonstrates the importance of verifying family structure information from more than one source. Indeed, the level of disagreement in this key measure between parents and students is relatively high. Whichever the source of error, the overall implication for family researchers remains the same: Relying on one respondent per household for this key measure may produce misleading results in analyses of data among different family structures.

Note

I thank Dr. Lynn K. White for her valuable and constructive suggestions on earlier drafts of the manuscript. I also thank Dr. Paul von Hippel for his advice on statistical analyses.

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