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Effects of Parent's Gender, Child's Gender, and Parental Involvement on the Academic Achievement of Adolescents in Single Parent Families

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Abstract We used a national database (Educational Longitudinal Study) to investigate the effects of parent's gender, child's gender, and parental involvement in school on the academic achievement of adolescents in singleparent families. A three way $2 \times 2 \times 2$ (parent's gender \times child's gender × parental involvement) MANCOVA was conducted with four student academic achievement indicators as dependent variables and SES as a covariate. The results indicated that parent gender and child gender interact with parent involvement to affect adolescents' academic achievement differentially. Specifically, daughters who lived with highly involved single-fathers performed better academically than the other groups did. These findings suggest that researchers who study single-parents' involvement in their adolescents' academic achievement need to pay more attention to gender-specific effects.

Keywords Single parent · Academic achievement · Gender · ELS · Parent involvement

Slightly more than one-half of all marriages in the United States end in divorce, and millions of children every year

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enter a new category of family structure: the single parent family. In 1970, 12% of all children in the US lived in single-parent homes; by the year 2000, that number rose to just over 30% (U.S. Census Bureau, 2000). Such a shift in family demographics has a direct influence on the life of children. One important area of a child's life that is dramatically impacted by family structure is education. Studies on children reared in single-parent families consistently indicate negative effects on a child's school achievement, completion, behavior, and social development (Amato & Keith, 1991; Astone & McLanahan, 1991; Downey, 1994; Featherstone & Cudnick, 1992; McLanahan & Sandefur, 1994; Pong, 1998; Pong & Ju, 2000).

Family structure remains an important area of investigation for researchers and practitioners who work with adolescents because, unlike other indicators of academic achievement, adolescents have little or no control over the parental structure in which they are reared. Jeynes (2005) reported that family structure was the single greatest predictor of academic achievement, although parents who discussed school issues and attended school functions also contributed to the academic success of students. To date, however, few studies have been conducted on single-parent families headed by fathers (Zhan & Pandey, 2004). Investigating the academic achievement of children reared in single-father families is of key importance as this family composition is the fastest growing segment of the singleparent demographic in the U.S. today. Since 1990, there has been a 62% increase in single-father families in the United States (U.S. Census Bureau, 2000). The question, then, of whether children fare better in homes with single mothers or single fathers becomes an important issue for parents, teachers, school helping professionals, and researchers in the areas of adolescent development and education. Videon (2005) stated that previous researchers have overlooked the possibilities that families headed by single-fathers or single-mothers might impact their sons' or daughters' academic achievement differently. The present research was designed to explore the unique effects of single fathers and mothers on sons' and daughters' academic achievement.

Single Fathers and Single Mothers

A substantial amount of literature suggests that children from intact families outperform their counterparts from single-parent families on typical academic achievement measures such as grades, standardized test scores, and teacher evaluations. (Amato & Keith, 1991; Featherstone & Cudnick, 1992; Ham, 2004; McLanahan & Sandefur, 1994; Pong, 1998; Pong & Ju, 2000). Nearly all of previous researchers, however, have combined single-mother and single-father families into the one category of single parent families without delineating whether the family is headed by a single mother or single father (Downey, 1994). Although the educational difficulties of children from single-mother families are well documented, much less is known about academic development of children from singlefather families. Early research on the question of achievement of children in single-father homes by Featherman and Hauser (1978) indicated that the academic achievement of children who grew up in single-father families was lower than that of children who grew up in single-mother families. In contrast, Mulkey, Crain and Harrington (1992) reported that children in single-mother homes have scored lower on academic achievement than children in single-father homes.

Studies on achievement, parenting, and education reveal many explanations for the achievement differences of children in single-parent homes. Although a mother's role is more important than a father's in explaining some of their children's psychosocial characteristics such as antisocial behavior (Stolz, Barber, & Olsen, 2005) and social competence (Grolnick & Slowiaczek, 1994), recent studies show that a father's role is important in explaining cognitive development (Biller & Kimpton, 1997) and youth social initiative (Stolz et al., 2005). Fagan and Iglesias (1999) reported that children from families with actively involved fathers have higher mathematics scores than their counterparts from families with less involved fathers. Updegraff, McHale and Crouter (1996) also showed that in families where fathers were actively involved in their children's education, girls maintained a high level of achievement during the transition to the seventh grade, whereas girls from families with less actively involved fathers declined in math and science performance. In light of previous research, other achievement related variables, such as parental involvement in school, are important to

include in the present study in order to explain how and why children living in single-parent families succeed (Domina, 2005; Minke & Anderson, 2005).

Parent involvement in single-parent families

Few would argue about the positive effects of parental involvement in their children's education. Parental involvement in school boosts the natural talents of students (Bacete & Rodriguez, 2004), improves school behavior (Minke & Anderson, 2005), and increases achievement in adolescents (Spera, 2005). For example, parental involvement in school improved math achievement when prior knowledge was held constant (Sheldon & Epstein, 2005). Moreover, student achievement and aspirations were associated with increases in parent involvement (Hong & Ho, 2005), and parents became more involved when they believed that their involvement was an expectation of their children or their children's teachers (Deslandes & Bertrand, 2005). There is substantial evidence that parental involvement in school is associated with children's academic achievement (Bacete & Rodriguez, 2004; Hong & Ho, 2005; Sheldon & Epstein, 2005), yet relatively few researchers have investigated the contributions that single fathers and mothers make to their children's academic achievement.

There are only a few studies of the effects of singleparents' involvement on their children's academic achievement. The National Center for Education Statistics (1997) reported that children in the 6th through 12th grades who live in single-parent families are more likely to earn "A's" if their parents were involved in their school activities. In single-father families, children in the 6th through 12th grades were twice as likely as children whose fathers had low involvement to earn mostly "A's" if their fathers were highly involved in their schools. Children in the 6th through 12th grade who lived in single-mother families were 70% more likely than children whose mothers had low involvement to earn mostly "A's" if their mothers were highly involved in their children's school activities. Although the National Center for Education Statistics study concerned the effects of parental involvement in school on children's academic achievement in single-parent families, it did not include children's gender as a variable in the analyses.

Matched gender hypothesis

Arguments in favor of children of single parents being reared by their same-gender parent (e.g., daughter with mother and son with father) lie in beliefs about gender role socialization and psychodynamic factors associated with developmental changes in boys and girls that are better understood by the same-gender parents (Lamb, 1981;

Thompson, 1983). Social learning theory posits the view that children learn gendered behavior from observing and modeling the thoughts and actions of the same-gender parent (Rossi, 1984). Children form schemas of gender appropriate behavior from their parents, and the argument follows that, without needed role models (e.g., the absence of one of the parents), children will suffer a deficit in learning what it is to be a boy or girl (Bozett, 1985). The overall message is that children receive a greater influence from their same-gender parent (Bowlby, 1988; Heatherington, 1981). Psychodynamic theories posit a similar rationale for the importance of matched-gender single parents and children (Freud, 1949). According to psychodynamic theory, children identify with the same-gender parent and conversely disidentify with the cross-gender parent. According to psychodynamic theory, the resolution of the innate struggle for gender identification is crucial to the successful development of gender appropriate urges and behavior so that the boy is not overly feminine and the girl not overly masculine (Juni, Rahamim, & Brannon, 1985).

Santrock and Warshak (1979) and Peterson and Zill (1986) reported that children who lived with cross-gender parents exhibited more behavioral problems than their peers living with same-gender parents. Also Radin and Russell (1983) contended that living with a cross-gender parent hurts academic performance. However, these studies have major methodological limitations (i.e., small and nonrandom sample) and have fallen out of favor with contemporary thought on gender and parenting. Powell and Downey (1997) used a national database to investigate the matchedgender hypothesis, and found that there were no significant differences on the following variables: view of self, relationships with others, school outcomes, parental involvement, and deviance. In fact, the results of Powell and Downey's study contradicted earlier studies (Peterson & Zill, 1986; Radin & Russel, 1983; Santrock & Warshak, 1979) that are based on the aforementioned major psychological theories.

Purpose of the present study

We used a national database (ELS 2002: Educational Longitudinal Study) to answer the following four research questions: (a) Is there a significant difference in academic achievement between adolescents who live in single-father households and adolescents who live in single-mother households?; (b) Is there a significant difference in academic achievement between adolescents who live with their same-gender parent and adolescents who live with their cross-gender parent?; (c) Is there a significant difference between adolescents who live with highly involved single parents and adolescents who live with less involved single parents?; (d) Does parents' gender

and children's gender interact with parental involvement in school to affect adolescents' academic achievement differentially?

Method

The sample

Data for the present study were derived from the Educational Longitudinal Study (hereafter referred to as ELS:2002). The ELS:2002 is the fourth major longitudinal study sponsored by the National Center for Education Statistics (NCES); it closely reflects the research purposes and designs of its three predecessor studies (NLS-72, HS&B, and NELS:88). ELS:2002 is appropriate for the present study for two reasons. First, ELS:2002 contains a wide array of student academic performance information not only from students, but also from parents, teachers, and school records. Although the school records (i.e., math and reading standardized test scores) were the objective indicators for the students' academic achievement, the data also provided teacher evaluations of each student's classroom behaviors as seen from the teacher's perspective. Second, the large nationally representative sample allowed for a powerful multivariate statistical test, which helps to overcome many of the limitations of previous research. Randomly selected participants from the source population, especially single father and single mother families, provides better generalizibility of the results.

The sample in the current study included tenth graders who had completed data on the research variables. The filters produced a sample of 2,156 high school sophomores (i.e., 169 boys and 139 girls who lived with a single father, and 863 boys and 985 girls who lived with a single mother) from the database of the ELS: 2002. Of the 2,156 students, 48.8% were boys and 51.2% were girls. There were approximately 61.3% "White, non-Hispanic," 10.2% "Black, non-Hispanic," 10.0% "Asian or Pacific Islander," 0.7% "American Indian or Alaska Native," 12.8% "Hispanic or Latino/a (any race)," and 5.0% "Multiracial." Approximately 37.5% were from the Southern U.S, about 14.9% were from the Northeast; about 25.2% were from the North Central region, and about 22.4% were from the Western United States. Approximately 26.5% of participants were from urban areas, about 32.4% were from suburban areas, and about 42.1% were from rural areas.

Variables

Socioeconomic status Research indicates that socioeconomic status (SES) is the best predictor of academic achievement and that low-SES forecasts low achievement (Caldwell & Ginther, 1996; Hobbs, 1990). In the present study, SES was characterized by the economic, social, and physical environments in which individuals live and work, as well as by demographic factors. Measures of SES included three equally weighted, standardized components: parent's education, family income, and parent's occupation (National Center for Educational Statistics (NCES), 2004). A standardized composite index (Z-scores) created by the National Center for Educational Statistics (NCES) (2004) has a mean of 0 and a standard deviation of 1. Consistent with previous research findings (Astone & McClanahan, 1991; Featherstone & Cudnick, 1992) students who lived with single mothers (M=-.20, SD=.69) had significantly lower mean scores on SES, t(2,154)=4.15, p<.001, than did students who lived with single fathers (M=-.02, SD=.72).

Single parent status A single parent is a parent with one or more children, who is currently neither married, nor living together with his or her partner (U.S. Census, 2000). Family structure has changed dramatically over the past several decades, and the identification and measurement of different family characteristics is not a simple task. In the present study, we used three items from the ELS:2002 Parent Questionnaire to measure family composition: (1) relationship of parent respondent to student, (2) whether parent respondent lived with a spouse or partner at the time of data collection, and (3) whether respondent lived with the student more than at least one-half of the time. We defined the student in single-father or single-mother families as a tenth grader who lived with only one parent more than at least one-half of the time. Information regarding the length of time the student had lived in a single-parent house was unavailable in the ELS:2002 dataset.

Parental involvement Parental involvement refers to parents' participation in their children's schooling by encouraging good study habits, communicating with school personnel, attending school activities, and teaching behavior that is conducive to academic success (Jenkins, 1997). Twelve items from ELS:2002 Parent Questionnaire were identified that reflect parental involvement in school. Responses indicate the degree to which a parent is involved with their child's activities. Sample items include: "Looking back over the past year, how frequently did you attend your tenth grader's school activities?" and "How frequently did you work on homework or school projects?" The format is a four-point Likert-type scale anchored with the words "never (1)," "rarely (2)," "sometimes (3)," and "frequently (4)." Factor analysis exhibited a global factor model. All 12 items loaded above .45 in the unrotated factor matrix. The Cronbach's alpha for these 12 items was .81.

Standardized math and reading test scores To measure students' academic achievement, both mathematics and reading test scores were used. In the tenth grade, all students completed both mathematics and reading tests, which were standardized scores collected in the ELS:2002 (National Center for Educational Statistics (NCES), 2004). Math tests contained items in arithmetic, algebra, geometry, data/probability, and advanced topics and were divided into process categories of skill/knowledge, understanding/comprehension, and problem solving. Reading tests consisted of reading passages from one paragraph to one page in length, followed by three to six questions based on each passage. Questions on the reading tests were categorized as reproduction of detail, comprehension, or inference/evaluation. We used the IRT (Item Response Theory) "T" score, which has a mean of 50 and a standard deviation of 10. This score is a norm-referenced measurement of achievement. That is, estimates of achievement level are relative to the population as a whole.

English and math teachers' evaluations In addition to standardized test scores from the ELS:2002 Teacher Questionnaire, English and Math teachers' reports of tenth grade students' classroom behaviors were used to measure students' academic achievement. A total of five items indicate the teacher's evaluation of students' classroom behavior. Sample items include: "How often is this student absent from your class?" and "How often does this student complete homework?" The format is a five-point Likert-type scale anchored with the words "never (1)," rarely (2)," "some of the time (3)," "most of the time (4)," and "all of the time (4)." The Cronbach's alpha for these five items was .77 for English teachers' evaluations and .78 for Math teachers' evaluations.

Data analysis

A three way $2 \times 2 \times 2$ (parent's gender \times child's gender \times parental involvement) MANCOVA, with student academic achievement (standardized test scores and teachers' evaluations) as dependent variables and SES as covariates (given the zero-order relation of this SES variable to dependent variables) was computed to examine the main and interaction effects of parent's gender, child's gender, and parental involvement in school on student academic achievement and control for the effects of the SES variable. Parent's gender was coded at two levels: Level 1 for single father, and Level 2 for single mother. Child's gender was recoded at two levels: Level 1 for son, and Level 2 for daughter. In addition, the parental involvement variable was recoded at two levels: Level 1 for single parent (total mean score is less than 3) who reported that he or she was never

or rarely involved in activities with the child, and Level 2 for single parent (total mean score is equal or greater than 3) who reported that he or she was sometimes or frequently involved in activities with the child.

Results

To examine the effects of the parent's gender, child's gender, and parental involvement in school on student's academic achievement, MANCOVA (multiple analyses of covariance) procedures were employed to guard against a type I error. Because four dependent variables (reading test score, math test score, English teacher's evaluation, and math teacher's evaluation) in this study were conceptually related to each other as suggested by the correlation coefficients (.319–.732), the MANCOVA procedure was more suitable for a type of analysis that controlled correlations among dependent variables.

Results of the MANCOVA indicated that the covariate of SES, Wilks' lambda=.79; F(4, 2,144)=96.67, p=<.001, was statistically significant. In addition, a significant main effect for child's gender, Wilks' lambda=.96; F(4, 2, 144)= 14.38, p < .001 was found. No main effects were found for either parent's gender, Wilks' lambda=.99; F(4, 2,144)= 1.98, p=.13, or parental involvement, Wilks' lambda=.99; F(4, 2, 144)=1.83, p=.14. Also, no significant two-way interaction effects were found. However, a statistically significant three-way interaction effect, Wilks' lambda=.98; F(4, 2, 144) = 3.11, p = .02, was found. Univariate follow-up tests conducted on the four academic achievement variables for child's gender indicated that girls had significantly higher scores than male students on the reading test, F(1, 2, 147) =5.17, p=.03, math teacher's evaluation, F(1, 2, 147)=22.99, p < .001, and English teacher's evaluation, F(1, 2, 147) =21.61, p < .001. In contrast, boys had significantly higher scores than girls on the math test, F(1, 2, 147) = 4.34, p = .04. In addition, the effects of the three-way interaction were found on all dependent variables: the math test, F(1, 2, 147) =5.58, p=.02; reading test, F(1, 2, 147)=4.21, p=.04; math teacher's evaluation, F(1, 2, 147)=6.19, p=.02; English teacher's evaluation, F(1, 2, 147) = 5.97, p = .02.

The three-way interactive effects of child's gender and parental involvement on standardized test scores (see Fig. 1) and teachers' evaluations (see Fig. 2) for singlefather and single-mother households were further investigated by conducting simple effects tests on the cell means. Follow-up analyses (see Table 1) revealed that neither parent's gender nor child's gender interact with parental involvement in school to influence the four academic achievement variables of sons and daughters in singlemother households differentially. However, the parent's gender and child's gender interact with the parental involvement variable to affect the four academic achievement variables of sons and daughters in single-father households differentially. Although sons in single-father households received the same or lower academic achievement scores regardless of the level of parental involvement in school, daughters in single-father households received much higher academic achievement scores when single fathers were involved more in their school activities. Academic achievement variables were, therefore, positively affected only when single fathers were highly involved in their daughters' school activities.

Discussion

In the present study, we used a national database to examine the effects of parents' gender, children's gender, and parental involvement in school on multiple indices of students' academic achievement in single-parent families. First, the results of the present study indicate that there were no significant differences in academic achievement between adolescents who lived in single-father households and adolescents who lived in single-mother households. The findings of the present study are not consistent with earlier studies (Featherman & Hauser, 1978; Mulkey et al., 1992). Although Featherman and Hauser (1978) reported that children who lived with single mothers had higher scores on academic achievement, Mulkey et al. (1992) reported that children who lived with single fathers scored higher on academic achievement. The findings of our study do not support the results from either of the studies.

Second, the results of the present study (interaction effect between parent gender and child gender) indicate that there were no significant differences on academic achievement between adolescents who lived with the same-gender parent and adolescents who lived with the cross-gender parent. This result contradicts the theoretical basis for the benefits of the matched-gender parent argument proposed by psychodynamic and social learning theory, but it supports Powell and Downey's (1997) study, which also showed no evidence of a matched-gender advantage. They used a 1980s national database in their study and concluded that single fathers can be role models to girls and to boys, just as mothers can be role models to boys and to girls.

Third, the results of the present study indicate that there were no significant differences between adolescents who lived with highly involved single parents and adolescents who lived with less involved single parents. This finding contradicts the results from National Center for Education Statistics (1997) study that children in the 6th through 12th grade who lived in single-parent families were more likely to get mostly "A's" if their parents were involved in their school activities. It should be noted that the National Center





for Education Statistics used a different dependent variable (grades) than the dependent variables (standardized test scores and teacher's evaluations) we used.

Finally, the results of the present study indicate that parent gender and child gender interact with parental involvement in school to affect adolescents' academic achievement differentially. Although sons who lived with single fathers, sons who lived with single mothers, and daughters who lived with single mothers received the same or lower academic achievement score regardless of whether the parental involvement level was low or high, only daughters who lived with single fathers received higher academic achievement scores when single fathers were involved more in their school activities. That is, the daughters who lived with highly involved single-fathers had higher scores than any other group on the four academic achievement variables we



Dependent variables	Low parent involvement $(n=856)$				High parent involvement (n=1,300)			
	Single father ($n=139$)		Single mother $(n=717)$		Single father (n=169)		Single mother $(n=1,131)$	
	Son (<i>n</i> =77)	Daughter $(n=62)$	Son (<i>n</i> =359)	Daughter $(n=358)$	Son (<i>n</i> =92)	Daughter $(n=77)$	Son (<i>n</i> =504)	Daughter $(n=627)$
Reading test score	49.72 (9.63)	49.96 (11.09)	48.13 (10.74)	49.61 (9.91)	47.93 (10.14)	51.23 (8.89)	48.62 (10.18)	49.57 (8.71)
Math test score	51.52 (9.98)	49.06 (10.74)	49.15 (10.43)	48.53 (9.81)	50.40 (10.09)	51.17 (9.22)	49.08 (10.13)	47.88 (9.27)
English teachers' evaluation	3.94 (.73)	4.12 (.60)	3.88 (.69)	4.04 (.65)	3.99 (.65)	4.42 (.46)	3.99 (.59)	4.06 (.58)
Math teachers' evaluation	4.01 (.68)	4.17 (.56)	3.94 (.65)	4.02 (.68)	3.97 (.76)	4.40 (.61)	3.93 (.65)	4.01 (.62)

Table 1 Means (standard deviation) for outcome variables by sex of child, sex of parent, and level of parent involvement.

Adjusted mean values after controlling for SES.

studied (reading test, math test, English teacher's evaluation, and math teacher's evaluation).

Why do the daughters who lived with highly involved single-fathers fare better than other groups on academic achievement? Tentative explanations for these results suggest that when children and adolescents view their parents in a friend role, parental authority is compromised by becoming either overly identified with the same-gender parent or too disengaged with the cross-gender parent, as suggested by the literature on gender identity development (Arditti, 1999). Our findings suggest that students benefit exposure to cross-gender perspectives. Children require certain boundaries from parents in order to distinguish their parents from friends or acquaintances. Past research indicates that fathers are less inclined to become friends with their daughters in the way they are with sons because they reported discomfort with issues concerning the onset of secondary sexual characteristics during adolescence (Kalman, 2003). Fathers are more comfortable with sons because they are better able to identify with the onset of male adolescence from their own experience (Downey & Powell, 1993). The parental-modeling effect caused by the cross-gender distance may offer an explanation as to why daughters who lived with highly involved single-fathers performed better in the investigated academic achievement measures, i.e., the fathers may exhibit simultaneously the characteristics of parent and coach as opposed to a friend and confidante. Naturally, there are exceptions; however, the results persisted even when all other relevant variables of explanation were held constant. Fathers, then, might not be likely to identify with daughters in terms of their social and interpersonal concerns in the ways that mothers might. The focus for fathers is more task-oriented or concrete, whereas for mothers the focus may be more holistic, accepting, and less demanding. Thus, highly involved single-fathers are more likely than low involved singlefathers to be "task-oriented and concrete" due to their involvement in school activities such as homework and volunteering.

Limitations and recommendations for future study

Although our results contradict the matched-gender hypothesis, they should be interpreted with some caution because of the nature of our data. First, our sample included adolescents who had experienced divorce at various times and because our database did not provide that information, we were unable to determine if timing of divorce is an influencing variable. Second, the participants in this study were all tenth grade students at the time of data collection. It is possible that the effects of parental involvement and matched-gender parents may have existed earlier in childhood. Therefore, we recommend that future researchers expand the current research by exploring the impact of different age groups on same-gender parents and academic development. Third, our study focused on adolescents' academic development. This result shows that further studies are needed to explain the influence on certain other areas, such as career and personal/social development. Fourth, when researchers use an existing dataset such as ELS: 2002, items available for variable measurement are limited. For the current research, items that measured parental involvement may not have reflected some important dimensions of the parental involvement. Much of the literature on parental involvement's importance in scholastic achievement can be found in the research of Epstein (1994) who described six types of parental involvement: parenting, communicating, volunteering, learning at home, decision making, and collaborating with the community. In the present study, however, the items that were used for the parental involvement variable only focus on school variables related to the following of Epstein's types: parenting (with respect to education), volunteering (with respect to school), and learning at home.

Despite these limitations, our use of a large nationally representative sample overcame many of the limitations of some of the previous studies that have used smaller, nonrepresentative samples. Finally, our intent is to promote increased discussion and research on academic, career, and social/personal development of children in single-parent families and to foster greater awareness and understanding of the effects of being reared by single parents on adolescents' educational development. We did so by our inclusion of the little studied and rapidly expanding demographic of single-parent fathers.

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