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Parents' Influence on the Math and Science Career Plans of Adolescents

Most educational and career decisions are made during adolescence and research indicates that girls are less likely than boys to pursue post-secondary education or careers in math- and science-related fields. One explanation for this trend is that parents' gender-typed attitudes directly affect their children's math and science self-efficacy (e.g., Eccles, Jacobs, & Harold, 1990; Hyde, 1997). Cross-sectional and short-term longitudinal studies investigating this hypothesis have found strong relationships between parents' gender-typed attitudes and their children's beliefs and achievement (Jacobs, 1991; Jacobs & Eccles, 1992); however, prior research has not assessed the long-term effects of parental influences on achievement outcomes, such as older adolescents' career and educational choices. In order to determine the long-term consequences of parents' attitudes on adolescents' achievement, the current study examined the ways in which parents' gender stereotypes during early adolescence affect the math/science self-concepts and career plans of their late adolescent children, and the actual occupational and educational choices their children make during late adolescence.

Method. This study used data from a large, longitudinal investigation (Michigan Study of Adolescent Life Transitions; MSALT) of students', parents', and teachers' attitudes during the early, middle, and late adolescent years. During the first wave of data collection, children were members of 143 sixth grade math classrooms located in 12 school districts in primarily White middle and working class suburbs outside of a large Midwestern city. The analyses reported here are based on items drawn from the surveys parents completed during the first and second year of the study that assessed their gender stereotypes and beliefs about their children. These responses were related to adolescent's perceptions of their math/science abilities and math/science career aspirations during the 10th grade and 2 years after

high school, as well as the adult child's actual occupation at 23 years of age. Scales used in these analyses were created by averaging across 2-3 items (all alphas > .60).

Results and Discussion. Generally, it was expected that parents' perceptions mediate the influence of adolescent's past performance on adolescent's career goals. To examine this pattern using path analyses, four hypotheses were tested. First, based on the research of Jacobs (1991) and Jacobs & Eccles (1992), indicating that parents' gender beliefs directly influence their perceptions of their children's abilities, it was hypothesized that beginning in early adolescence, the effects of child's sex and mother's gender stereotype interact to influence mothers' perceptions of their adolescents' math abilities, as well as mothers' perceptions of their adolescents' abilities to succeed in careers involving math. Second, based on past research (Jacobs, 1991; Jacobs & Eccles, 1992; Frome & Eccles, 1998), it was predicted that mothers' perceptions of their adolescents' abilities to succeed in math or science careers would influence adolescents' own self-perceptions of ability, after controlling for adolescents' past performance. Third, based on Raskin's (1998) research about the timing of career goal decisions, it was hypothesized that adolescents' self-perceptions of ability during early high school influence their perceptions of career self-efficacy following high school graduation.

All of the predictions were supported. Adolescent's sex, mother's gender stereotype, the interaction of adolescent's sex and mother's gender stereotype, and adolescent's ability in math during the Fall semester of 6th grade accounted for 32% of the variance in mothers' perceptions of their adolescent's math ability during the Spring semester of 6th grade, and the interaction of mother's gender stereotype and adolescent's sex had a significant influence on mothers' perceptions of adolescents' math abilities. In addition, path analyses revealed that mothers' perceptions of their adolescents' abilities influenced adolescents' own self-perceptions of ability, even after controlling for adolescents' past performance. Regressions were run separately for math and science, once using adolescents' self-perceptions of math ability as the dependent variable ($R^2=.14$) and once using adolescents' self-perceptions of physical science ability as the dependent variable ($R^2=.10$).

Finally, path analyses indicated that adolescents' self-perceptions of math and science ability influence career self-efficacy and are mediated by mothers' perceptions ($R^2=.30$, for math; $R^2=.20$, for science). Analyses testing the effects of mothers' perceptions of their adolescents during middle school and high school on the career choices of their young adults after graduating from college, or high school (if individual is non-college-bound), will also be discussed.

The results of this study indicate that the interaction of parents' gender stereotypes and child's sex influence parents' perceptions of their adolescents' abilities, which in turn influence adolescents' self-perceptions of abilities and career plans in math and science six years later. These findings extend previous studies (Jacobs, 1991; Jacobs & Eccles, 1992) by showing that the influence of parents' perceptions and gender stereotypes extend well beyond the early adolescent years and impact the educational choices and ultimate career choices of their children. In addition, this study illustrates the role of general gender-stereotypes in influencing parents' perceptions about their own adolescents' achievement and potential career goals.

References

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