

EXPECTANCY EFFECTS ARE ALIVE AND WELL ON THE HOME FRONT: INFLUENCES ON, AND  
CONSEQUENCES OF, PARENTS' BELIEFS REGARDING THEIR DAUGHTERS' AND SONS' ABILITIES  
AND INTERESTS

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A small but growing literature is emerging on parental beliefs and stereotypes. Several researchers (e.g. Eccles, Jacobs, & Harold, 1990, Goodnow, 1989; Goodnow & Collins, 1990; Jacobs, 1987; Yee & Eccles, 1988) have suggested that such beliefs are important because of their impact on the expectations and goals parents develop for their children, on parents' perceptions of their children's interests and talents, and on the ways in which parents interact with their children. Previous studies have documented the positive impact of parents' confidence in their children's academic abilities on children's own self-perceptions and actual performance (e.g. Alexander & Entwisle, 1988; Eccles-Parsons et al., 1982). These studies clearly indicate that parents' expectations for their children's performance in math and English have an impact on both children's subsequent performance in these subjects and their view of their own math and language arts abilities. By late elementary school this effect is stronger than the children's own current performance levels in these subject areas. But what factors are shaping parents' expectations for their children's performance potential in various activities? And how exactly are parents' beliefs actually affecting their children's self-perceptions, interests and performance?

### (Show General Model)

This paper outlines a theoretical framework (see Model) my colleagues and I have been working on over the last fifteen years for investigating both the influences on parents' beliefs regarding their children's abilities across activity domains, and the processes through which these beliefs may be affecting both children's performance and involvement in various activities, and their perceptions of their own competence in these various activity domains. Basically, we believe that parents' views of their children's competencies in various activities are influenced by several social factors in addition to their children's actual performance level in each activity domain. Primary among these social factors are the status characteristics of parents and children, and parents' interpretative belief systems. For example, parents' gender role belief systems, in interaction with their child's gender, should affect the inferences parents draw from their children's performance about their children's performances in various gender-role stereotyped activity domains. These inferences, in turn, should affect parents' expectations for their children's future performance in these activities, and should affect the opportunities these parents given their children to develop skills in these various activity domains.

My colleagues and I have been studying these relationships for the past 15 years. We have been gathering longitudinal information from children and their families in three different samples. Today I'll present some of the results relevant to these predictions from two of these samples. I am going to focus on the issue of sex differences because this is an easy individual difference variable to assess, because there are substantial differences between girls' and boys' involvement in the activity domains we have studied across both the elementary and secondary school years, and because my colleagues and I are especially interested in the extent to which parents' beliefs play a role in gender-role socialization. I am going to talk in particular about two school achievement domains (math and reading/English) and the sport domain. The work I am reporting has been done collaboratively with the following people: Allan Wigfield, Janis Jacobs, Rena Harold, Amy Aberbach, Carol Freedman-Doan, and Kwang Suk Yoon

Let me begin with one background finding. In our previous work we documented the fact that parents' perceptions of their children's math ability has a significant impact on the children's view of their own math ability that is independent of the impact of the child's actual performance on both the parents' and

children's perceptions of the children's math ability. The next figures illustrate similar findings with a new sample of sixth graders in southeastern Michigan. I will be referring to this sample as Study 1. Study one (The Study of Adolescent Life Transitions- SALT for short) is a seven-year longitudinal study of adolescent development in the context of the family and the school. In 1983, approximately 2000 early adolescents were recruited into this study when they were in the sixth grade. About 1000 of their families agreed to participate as well. These families have been participating in the study since that time. They represent a wide range of socioeconomic backgrounds. I am only presenting the data from the mothers. The father data present a very similar picture. The data I'll reported on today were collected in the fall and spring of the adolescents' sixth grade school year (1983-84). Parents were asked a series of questions regarding their perceptions of their child's competency, and their expectations for their child's performance in three domains: math, English, and sports. Previous studies had indicated the importance of tapping parents' perceptions of their children's competency with several different constructs. Consequently in Study One we used seven-point Likert scales to assess the following parent perceptions: a) child's current competence (2 items: perceived current level of ability and perceived current level of performance), b) difficulty of domain for child (2 items: perceived difficulty and amount of effort necessary to do well), c) child's natural talent (1 item), d) future performance expectations in math and English courses (1 item in each domain), and e) future career performance expectations in careers requiring good skills in math and English (1 item in each domain). Let me focus right now on the mother's perception of her child's math and English ability

**(Show path analyses on mediating effects of parent beliefs)**

As you can see, mothers' ratings of their children's abilities in math and English are related to the teacher's ratings of the children math ability (we only had the teachers rate the math ability due to limitations on the amount of time that teachers would spend filling out individual student ratings). But, more importantly, these results replicate our previous findings: Parents' view of their children's ability in both math and English have an important impact on the children's own self-perceptions. Furthermore, we have tested this relationship using longitudinal cross-lagged analyses, done with LISREL as specified by Rogosa, (19XX). The results are consistent with the hypothesized causal direction. Clearly, parent and child perceptions are reciprocally related. Nonetheless, mother's perceptions of their children's ability at this age do appear to influence change over time in the children's self-perceptions even when an independent indicator of the children's competence is included as a control. Mothers' perceptions of their children's math abilities also predict the children's interest in doing mathematics.

**(SHOW LISREL DIAGRAMS FOR MATH)**

Based on these findings, and on the work by Entwisle, Alexander and their colleagues, we have been studying the influences on parents' perceptions of their children's abilities. Clearly parents' perceptions in the academic domains are related to objective information provided by the school about how well their child is doing. But we are interested in identifying the other more subjective influences on parents' perceptions of their children's abilities.

Child sex is a very important organizing construct for addressing this question. We know in the academic domain, for example, that gender differences in performance in mathematics are small and don't emerge with great regularity prior to secondary school.

Nonetheless, our previous research has shown that parents believe that sex differences in math talent exist. We have replicated this effect in the SALT sample.

### SHOW OVERHEAD FOR TABLE OF SALT DIFFERENCES AND LKS DIFFERENCES

We get similar differences in these parents' perceptions of their children's ability in English and Sports at grade 6.

We have also replicated the results with a much younger sample. I will refer to this study as Study Two (The Michigan Study of Middle Childhood). This is a four year longitudinal study of the development of elementary-school-aged children again in the context of the family and the school. In 1986, approximately 600 children and their families were recruited into this study. The children were in either kindergarten, first, or third grade. These families have been participating annually in the study since that time. The data summarized today were collected in the spring and summer of the first year of the study (1987). Similar scales and items were used in Study Two. The results are summarized in the table on the overhead.

Gender-role stereotypic differences emerged for both English and sports. Parents of daughters rated their child as more competent in English than parents of sons and vice versa for sports. However, there was no sex of child effect on the parents' perceptions of younger children's mathematical competence. Apparently this effect depends on the age of the child: We know from our previous studies that the sex of child effect in the math domain is stronger and quite consistent among parents of junior and senior high school students.

Why do parents hold these gender-differentiated perceptions of their children's competencies in these three domain. This is the one of the two questions I will focus on today.

We also know that gender differences continue to exist in adolescents' enrollment patterns for mathematics and English - males are more likely to enroll in advanced math courses and to major in math-related fields in college. In contrast, females are more likely to major in languages, and literature in college than males. There are also quite large gender differences in children's and adolescents' participation in various sport activities, especially competitive team sports. Do these gender differences result, in part, from the fact that parents have gender differentiated expectations for their daughters and sons? This is the second question I will focus on today.

### Why do parents hold these sex differentiated beliefs?

Many explanations have been offered to account for the gender-role stereotyping of people's ratings of males' and females' competencies in various domains. The most critical issue for this paper is the extent to which parents' stereotypical perceptions of their children are either accurate, or are a reflection, at least in part, of processes linked to perceptual bias. This is a very difficult issue to settle unequivocally because it is currently impossible to reach consensus on what criteria we should use to assess the accuracy of gender-role stereotypes. There is no doubt that parents' perceptions of their children's competence in academic subjects are highly correlated with teacher's ratings of the children's competence and with various indicators of the children's performance and achievement, such as school grades and standardized test scores (Alexander & Entwisle, 1988; Eccles-Parsons et al., 1982). But are their gender-role stereotyped perceptions an accurate reflection of true gender differences in either talent or competence? This question is difficult to

answer because females and males are treated so differently by their parents and their peers from very early on in their lives. Consequently, it is impossible to get a good indicator of natural talent that is uninfluenced by the processes associated with gender-role socialization - the very processes we are trying to document. For example, can we conclude that parents' gender-role stereotyped perceptions of their six year old children's talent in sports are accurate if we find that the male children do, indeed, perform better than the female children on a standardized test of athletic skill at this age? Not really, because it is quite likely that the female and male children have already had different opportunities to develop their athletic skills. The best we can do at this point is to use the strategy proposed by Jussim (1989). This strategy involves assessing the extent to which the perceiver's judgments are related to the variables of interest (in this case the child's gender) even after controlling for the possible association between the perceiver's judgment and more objective indicators of the children's actual performance level. If they are, then we can begin to try to identify the mediating cognitive processes that account for the biased portion of these perceptions (i.e. the portion not due to actual differences in the performance levels of girls and boys).

Due to the extensive amount of research that has been done on gender differences in mathematics, the mathematics domain provides the most fully developed example of this logic at present. In both our own work (see Eccles-Parsons et al., 1982 and Eccles and Jacobs, 1986) and the work of Entwisle and her colleagues (see Alexander & Entwisle, 1988), it is clear that parents' perceptions of their children's competence in mathematics are influenced by the children's gender independent of the children's actual performance in mathematics. As noted earlier it is also clear that there are sex of child effects on parents' ratings of their children's competence in mathematics in populations that do not evidence any significant differences in the performance of the female and male children on either grades or standardized test scores. Comparable patterns of results are just beginning to be reported in the domains of English and sports. For example, Jacobs and Eccles (1990) have found that child's sex has an independent influence on parents' ratings of their sixth grade child's athletic talent after controlling for the teachers' ratings of the children's athletic talent.

Thus it appears that something other than overt performance is influencing the formation of parents' perceptions of their children's competence in both math and sports. What might these factors be, and do they generalize to domains other than mathematics? I am going to focus on three possible influences

First, there may be a true sex difference in the children's aptitude.

Second, aptitudinal differences may be minor or non-existent but parents may attribute their children's performance to different causes, leading them to different conclusions regarding their female versus their male children's "talent".

Third, parents may generalize their category-based, gender-role stereotypes to their target-based judgements of their own children's competence.

I will discuss evidence for each of these explanations.

### **Real Gender Differences in Children's Aptitude**

This explanation comes in two forms. First, in the domains of English and sports, there are measurable sex differences in children's performance by the time they enter school. Are these differences due to real gender differences in aptitude? As we already noted this is difficult to assess due to the fact that boys and girls are treated so differently from the time of birth. But even if there is a kernel of truth to the parents' perceptions in these domains, I will be presenting evidence that the sex of child differences parents' perceptions of their children in these domains continue to be significant even after independent indicators of the children's ability are included in the analyses as controls

Second, in the domain of math, the differences in performance are very small, don't emerge until adolescence and depend on the particular performance measure used. Nonetheless, there might be "real" sex differences in aptitude but girls might compensate by working harder than boys in order to do so well. How does one evaluate the validity of this suggestion? One way is to compare the performance of females and males on a specific task that is considered to be more closely related to aptitude, and less closely related to effort, than are school grades. If gender differences appear on this task in a population in which there are no gender differences in math course grades, then one might conclude that there is a true aptitudinal difference that is being overcome by a gender difference in effort. Evidence reported by Benbow and Stanley (1980) is consistent with this interpretation. They found that gifted boys score higher than gifted girls on standardized test scores and concluded that the boys have more natural aptitude for math than the girls. Unfortunately, they did not measure effort or prior exposure to mathematics and, thus cannot rule out the possibility that the gender differences on these "aptitude" tests are due to gender differences in experience or a gender difference in test taking strategies (see Eccles & Jacobs, 1986). In addition, although there is a reliable gender difference on standardized tests of math "aptitude" among the gifted, the evidence of such differences among more normally distributed samples is much less reliable, and the differences are much smaller whenever they are obtained (Eccles, 1984).

Furthermore, several findings from the Eccles-Parsons et al. (1982) study cast doubt on the notion that girls compensate for lower levels of aptitude with hard work. First and foremost, there were no sex differences on either standardized tests of math aptitude or on school math grade. Second, there was not a significant gender difference in the amount of time the boys and girls reported spending on their math home and school work. Finally, the teachers of the boys and girls in this sample did not report any sex differences in these children's talent for mathematics (Eccles [Parsons], 1983). Nonetheless, there was a significant sex of child effect on the parents' ratings of how difficult math was for their child. This pattern of findings makes it unlikely that the sex of child effect found for the parents' confidence in their children's competence in this study was due primarily to either a "real" gender difference in math talent or to "real" gender differences in the amount of work the children had invested in mastering mathematics. Although these explanations may be true in some populations, the Eccles Parsons et al. (1982) study suggests that a child's gender can affect parents' confidence in their child's math competence even when effort and ability are controlled.

Similar processes could be going on for the English and sport domain. But, since comparable studies have not been done in the domains of English and sports, the validity of the compensation argument cannot be assessed at this point in these domains.

2. Now let me turn to the second explanation, namely that the effect of child's sex on parents ratings reflect attributional processes.

According to attribution theory (Weiner, 1974), perceptions of another's competence depends on the causal attributions made for the person's performance. If parents of boys make different attributions for their children's math performance than parents of girls, it would follow that these parents should develop different perceptions of their children's math competence. In a test of this hypothesis, Yee and Eccles (1988) found that parents of boys rated natural talent as a more important reason for their child's math successes than did parents of girls.

#### SHOW OVERHEAD ON ATTRIBUIONAL DIFFERENCES IN YEE AND ECCLES

In contrast, parents of girls rated effort as a more important reason for their child's math successes than did parents of boys. In addition, to the extent that the parents attributed their child's success in mathematics to effort, they also rated their child as less talented in mathematics.

#### SHOW OVERHEAD ON LINK OF ATTRIBUTIONS TO PERCEPTIONS OF CHILD

Conversely, to the extent that they attributed their child's success in mathematics to talent, they also rated their child as more talented in mathematics. Thus, it appears that the gender-role stereotyped attributions parents make for their children's performance may be important mediators of the parents' gender-role stereotyped perceptions of their children's math competence.

The data from our study of sixth graders and their parents provide a direct test of this conclusion. These mothers were asked to imagine a time when their child did very well in mathematics, reading and sports and then to rate, on a seven point Likert scale, the importance of the following six possible causes in determining this success experience: natural talent, effort, task ease, teacher help, parent help, and current skill level. Significant gender of child effects were obtained on attributions of success to natural talent in each domain and the pattern of these differences reflect the sex -typing of the domains .

(Show Success Attribution Figure)

To test the mediation hypothesis we did a series of regression analyses on those mothers' perceptions that yielded a significant gender of child effect in each domain . According to Baron and Kenny (1986), support for a mediational hypothesis consists of demonstrating that the relationship between variables A and C is reduced or eliminated when the hypothesized mediating variable B is entered into the regression equation. We used a path analytic procedure to test this effect. The results for math are illustrated in the next figure. Consistent with the mediational hypothesis, the significant relationship of child's gender to the relevant parent outcome variables (i.e. parents' perceptions of the child's natural math talent, the difficulty of math for their child, and their expectations regarding the child's likely future success in both math courses and a math-related career) disappear once the relationship between the child's gender and the parents' attributions for the child's math success to talent is controlled.

(Show path analysis figures for attributions)

Comparable results for the talent attribution emerged in both the reading and sport domains. These results are illustrated in the next two figures. As predicted, children's



gender influenced their mothers' causal attributions; which, in turn, influenced the mothers' perceptions of, and expectations for, their children. In these domains, we still find evidence of a direct effect of child's sex on parents' perceptions. The size of this effect, however, is significantly reduced by including the parents' causal attribution in the path analysis.

These data provide good preliminary support for the hypothesized biasing effect of causal attributions on parents' perceptions of their children's competencies. However, it is important to note that these beliefs are all highly interrelated, and the data are correlational in nature. The consistency of the findings across domains indicates that the relationships are reliable but the actual causal direction of the relationships is still at issue. We are just beginning the longitudinal analyses necessary to pin down the predominant causal directions of influence among these various beliefs and preliminary analyses support the causal direction illustrated in these figures: Causal attributions at time 1 do appear to impact on parents' perceptions of their children's ability at time 2 (one year later) even after controlling for the parents' time 1 perceptions of their children's abilities.

(Preliminary analyses suggest that parents' perceptions of their children's competence at Time 1 influence causal attribution made at both Time 1 and Time 2. Furthermore, these analyses suggest that parents' causal attributions for their children's performances prior to Time 2 affect the parents' perceptions of their children's competence at Time 2. Finally, the impact of children's gender on parents' perceptions of their children's competence at Time 2 in both math and English appears to be mediated, at least in part, by the impact of parents' perceptions of their competence at Time 1 and of parents' causal attributions of their successes in these two domains. These preliminary findings add support to our conclusion that gender of child differences in parents' causal attributions for their children's successes in each of these domains contribute to the gender-role stereotyped bias we find in their perceptions of their children's competencies in each of these domains.)

3. Now let me turn to the third explanation; namely that the sex of child of effects on parents' beliefs reflect the biasing influence of gender-role stereotypic beliefs regarding sex differences in natural talent in various domains.

Both Eccles (1984) and Jacobs and Eccles (1985) have hypothesized that parents' gender-role stereotypes regarding the extent to which males or females, in general, are likely to be more talented in a particular domain will impact on their perceptions of their own child's ability in this domain, leading to a distortion in the parents' perceptions of their children's ability in the gender-role stereotyped direction.

#### SHOW GENDER ROLE STEREOTYPE MODEL DIAGRAM

Essentially, we are predicting that the impact of the child's gender on parents' perceptions of their child's ability in any particular domain will depend partially on (or will be moderated by [Baron & Kenny, 1986]) the parents' gender-role stereotypes regarding ability in that domain. Furthermore, we are predicting that this effect will be significant even after one has entered an independent indicator of the children's actual level of competence in the domain as a control.

Before presenting evidence to support these hypotheses, it is important to put them in the broader context of research on the link between category-based beliefs

and target-based beliefs. Although there has been very little study of this link in families, or as a developmental phenomena, there has been quite a bit of relevant research in social psychology. Two basic views have emerged. The work in the field of stereotyping and expectancy effects has repeatedly documented the impact of the perceiver's category-based beliefs (stereotypes) on the perceiver's perceptions of specific members of the social category (e.g. Darley & Gross, 1983; Duncan, 1976). In contrast, work in the area of social judgment has pointed to the power of individuating information to override the impact of stereotypical beliefs on perceptions of specific individuals (e.g. Locksley, Borgida, Brekke, & Hepburn, 1980; Locksley, Hepburn, & Ortiz, 1982). These researchers suggest that when specific individuating information about a particular person is available, such as past or present behavior, stereotypes will exert little, if any, effect on the judgments made about the person. For example, although a parent may believe that boys in general are superior in math when compared to girls, they may not believe that a particular boy is better in math than a particular girl.

Numerous studies have attempted to resolve the discrepancies in these two perspectives. These studies have now documented a variety of factors that influence the extent to which social perceptions are influenced by the perceiver's stereotypic beliefs versus individuating information the perceiver receives about the target (e.g. Higgins & Bargh, 1987; Hilton & von Hippel, 1988; Hilton & Fein, 1989). As Hilton and Fein (1989) conclude: "Social judgment is not uniformly dominated by either categorical information or by individuating information. Perceivers do not always ignore individuating information nor do they always suspend their stereotypes when individuating information is available. Instead, the results indicate that social judgment involves a dynamic interplay between the category-based expectations of the perceiver and the information that is available from the target." (pg. 208).

But, what do these conclusions tell us about the probability that parents' gender-role stereotypes will affect their perceptions of their own child's ability? This is a complicated question. On the one hand, parents have ample opportunity to get a great deal of individuating information about their child's ability in specific subject areas. And evidence suggests that when individuating information about an individual is both readily available and clearly diagnostic about the characteristic being evaluated, perceivers are likely to attend primarily to this individuating information and ignore their stereotypic beliefs (Hilton & von Hippel, 1988). This would suggest that parents' gender-role stereotypes will have little or no impact on their perceptions of their children's abilities.

On the other hand, the strongest support for expectancy effects typically occurs in naturalistic settings with naturally occurring beliefs and perceptions (Jussim, 1986). In addition, categorical beliefs or stereotypes may have their largest effect "when categorical information can disambiguate the diagnostic meaning of individuating information" (Hilton & Fein, 1989, p. 210). Families are clearly naturalistic settings and both parents' gender-role beliefs and their perceptions of their children's abilities are naturally occurring social cognitions. In addition, work in attribution theory (e.g. Weiner, 1974) documents the fact that achievement-related outcomes are ambiguous as to their cause. And we have already documented the fact that parents' causal attributions for their children's competencies in gender-role stereotyped domains are affected by their children's gender. This suggests that parents' category-based, gender-role stereotypes might affect their perceptions of their own child's competencies.

We know of no studies that have tested this hypothesis. As reported earlier, it is the case that parents hold gender-differentiated views of their children's academic and non-academic abilities at a very early age and that these beliefs are more gender-differentiated than are objective indicators of the children's actual performance in these domains (e.g. Alexander & Entwisle, 1988; Eccles, Jacobs, Harold, Flanagan, & Yee, 1989; Eccles & Harold, 1990; Jacobs & Eccles, 1985). These studies, however, did not look at the actual relationship between parents' gender-role stereotypes and their perceptions of their own child's ability. The critical issue is not whether parents, on the average, give gender-differentiated estimates of their children's abilities. Instead, the issue is whether or not parents who endorse the culturally dominant gender-role stereotype regarding the distribution of talent between males and females distort their perception of their own child's abilities in a direction that is consistent with the gender-role stereotype to a greater extent than parents who do not endorse the stereotype. Evidence from both Studies 1 and 2 support this hypothesis.

In Study 2 - the Michigan Study of Middle Childhood-, we asked the mothers at Time 1 in an interview who they thought was naturally better at mathematics, reading, and sports - boys, girls or neither. We also asked them in a separate questionnaire to rate on a seven-point Likert scale how much natural talent their child had in each of these three domains, how difficult (or easy) each of these domains was for their child, and how important they thought it was to their child to be good in each domain. In each domain we tested the significance of the interaction of the gender of one's child with the parents' category-based gender-role stereotypes in predicting the parents' ratings of their own child's competency. All nine interactions were significant (Eccles et al., 1989). The results for mathematics are particularly interesting.

#### **SHOW MATH TALENT FIGURE**

As you may recall, on the average, the sex of one's child did not affect these mothers' perceptions of either their child's math talent or the difficulty of math for their child. But, the sex of their child did affect their ratings of the child's competence in math when it was looked at in interaction with their category-based gender-role stereotype of mathematical competence. As predicted, mothers who believe that males are naturally more talented in mathematics evidence a significant sex of child effect in their ratings of their children's math ability that was consistent with their category-based stereotype; in contrast, the sex of child was not significant for the mothers who believed that neither males nor females are naturally more talented at mathematics. Similar results were obtained for the difficulty and importance ratings.

#### **SHOW MATH DIFFICULTY FIGURE**

#### **SHOW MATH IMPORTANCE FIGURE**

Similar gender-role stereotypic effects characterized the mothers' reports on their children in sports and English. Let me illustrate these findings with the mothers' ratings of the ease with which their children learn in each of these domains.

#### **~~SHOW SPORT AND ENGLISH DOMAINS FOR EASE.~~**

Although it is possible that these effects are due to the impact of target-based information on the mothers' category-based gender-role stereotypes, the extreme

stability of gender-role stereotypes across time in a variety of populations makes this an unlikely alternative interpretation (Rothbart, 1989).

Jacobs and I have explored these effects in the domains of math and sports more fully using data from Study 1 - The Michigan Study of Adolescent Life Transitions (Jacobs, 1987; Jacobs & Eccles, 1990). Using path analytic techniques, we tested for the impact of the interaction of the sex of one's child and one's category-based gender-role stereotypes on mother's perceptions of their child's ability, controlling for the effect of an independent indicator of the child's actual ability level (the teacher's rating of the child's ability). The general model we tested is shown in the next overhead.

### SHOW MODEL OF PATH ANALYSES

The interaction term was created so that a positive coefficient indicates that the mother was distorting her impression of her child in the gender-role appropriate direction. That is, if she was talking about a boy child, her perception of her child's ability was higher than what would have been predicted using only the teacher's rating; in contrast, if she was talking about a girl child, her perception was lower than what would have been predicted using only the teacher's rating.

### SHOW PATH ANALYSES FROM JACOBS AND ECCLES

The results are illustrated in next overheads. Once again the data are consistent with our hypothesis. The interaction term is significant and the coefficient is positive for both math and sports. Thus, to the extent that these mothers endorsed the traditional gender-role stereotypic belief that males are naturally better in math and sports than are girls, they distorted their perception of their child's competence in these domains in the gender-role stereotypic direction. In addition, consistent with the findings of Eccles Parsons et al. (1982), the mothers' perceptions of their children's competence in each domain had a significant impact on the children's own self-perceptions even after the children's actual performance in each domain was controlled.

These data provide strong evidence of the processes associated with expectancy effects. But they do indicate how well the data fit the model we are proposing. To evaluate this fit, we tested a simplified model using LISREL for each of these two domains. Because the interaction of child sex and mother's sex-role stereotype is significant, we did a two group hierarchical LISREL model. The results are shown in the next two overheads. The top path coefficient in each case is for females and the bottom coefficient is for males. The model specifies that the mother's stereotype influences her perception of her child's ability even after an independent indicator of the child's ability is entered as a control. It also tests whether the child's ability, as indicated by the teacher's rating of the child influences the mothers stereotype. The fit of the models to the data in both of the math and sport domains is very good as indicated by the Joreskog's Goodness-of-fit index. Lets look at the math domain first. In this domain, there is no significant relationship between the teacher's rating of the child's ability and the mother's stereotype for math. There is a strong relationship between the teacher's rating of the child's ability and the mother's rating of the child's ability. But most importantly for the present discussion, there is a significant relationship between the mother's stereotype and her perception of her sons' math ability. As predicted the more the mother stereotypes math as a male domain, the higher she rates her son's math ability. Conversely, the more she stereotypes math as a female domain, the lower she rates her daughter's math ability.

Similar results emerge in the sport domain. But in this domain, the daughter's sport ability, as rated by the teacher, is related to the mother's gender-role stereotypes. Mothers with more sports able daughters are less likely to stereotype sports as a male domain than other mothers. In addition, however, to the extent that mothers do stereotype sport as a male domain, the rate their daughters' sport ability lower than one would predict given the teacher's estimate of the girl's ability. This latter effect does not hold for sons.

These results provide support for the hypothesis that category-based beliefs do bias parents' perceptions of their own children's competencies. Given the power of individuating information and the large amount of such information that parents are exposed to as their children grow up, we would not expect the biasing effects to be large, and they are not. Nevertheless, although the effects are not large, they are both reliable and consistent across two activity domains, and they do appear to influence the development of the children's own self-perceptions in a manner consistent with the self-fulfilling prophecy hypothesis.

### SO WHAT?

I have argued thus far that gender differentiation in parents' perceptions of their children's abilities in various domains results, in part, from processes associated with expectancy effects. In particular, I presented evidence that both parents' causal attributions for their children's successes, and parents' category-based gender-role stereotypes, lead to perceptual bias in their impressions of their children's competencies in gender-role stereotyped activity domains. Although parents' perceptions of their children's competencies in math, English and sports are strongly related to independent indicators of their children's actual competence in these domains, the evidence clearly indicates that parents' perceptions of their children's competencies in math, English and sports are also influenced by their children's sex and by the parents' gender-role stereotypic beliefs about which sex is naturally more talented in these domains. Furthermore, the evidence supports the conclusions that these influences are independent of any actual differences that might exist in the children's competencies. Thus, our findings suggest that perceptual bias is operating in the formation of parents' impressions of their children's competencies in gender-role stereotyped activity domains.

Proponents of a self-fulfilling prophecy view of the socialization of gender differences in children's competencies in various activity domains would argue that these differences in parents' perceptions of their children's competencies set in motion a set of events that ultimately create the very differences that the parents originally believed to exist. We have identified one mechanism through which such a process might be mediated; namely, the children's self-perceptions. We have argued elsewhere that children's self-perceptions and task-perceptions influence the choices children make about their involvement in various activities (see Eccles {Parsons} et al., 1983). In particular, we have suggested that children will spend more time engaged in activities that they think they are good at, and that they value and enjoy.

We have now documented this relationship in the domains of math and sports. In math, we have demonstrated that decisions regarding course enrollment in high school are directly, and powerfully, influenced by adolescents' confidence in their math ability and by the value they attach to developing math skill (Eccles {Parsons} et al., 1983).

~~SHOW OVERHEAD ON COURSE ENROLLMENT PREDICTION~~**SHOW OVERHEAD ON SPORT PARTICIPATION**

In sports, we have demonstrated that the gender difference in the amount of free time sixth graders spend engaged in athletic activities is mediated by gender differences in the adolescents' confidence in their athletic ability and gender differences in the value they attach to participating in athletic activities (Eccles and Harold, 1990). We have also shown that gender differences in adolescents' self-perceptions are mediated, at least in part, by the gender-role stereotyped bias in their parents' perceptions of their competencies in various activities. Together these results support the conclusion that processes associated with the self-fulfilling prophecy phenomenon contribute to the socialization of gender differences in the domains of mathematics and sports.

But exactly how do parents' gender-role stereotyped perceptions of their children's competencies influence the children's self and task perceptions? We are just beginning to study this issue.

**SHOW MODEL OF INFLUENCES ON CHILD**

This figure illustrates the theoretical model we are testing. Essentially, we believe that parents' gender-role stereotypes, in interaction with their child's sex, affect the following mediators: (1) parents' causal attributions for the children's performance, (2) the parents' emotional reaction to their children's performance in various activities, (3) the importance parents' attach to their child acquiring various skills, (4) the advice parents' provide their child regarding involvement in various skills, and (5) the activities and toys parents provide for their children. In turn, we predict that these subtle and explicit mediators influence the development of following child outcomes across the various gender-role stereotyped activity domains: (1) children's confidence in their ability, (2) children's interest in mastering various skills, (3) children's affective reaction to participating in various activities; and, as a consequence of these self and task perceptions, (4) the amount of time, and type of effort, the children end up devoting to mastering, and demonstrating, various skills. Empirical work assessing these various causal links is now under way. Today, I'd like to focus on one of these links - the impact of the parents' perceptions of their children on the types of experiences they provide for their children.

We are just beginning to explore this link with the information we have gathered in Study 2. In addition to asking the parents for their perceptions of their children's abilities and interests in each of these domains, we asked the parents in Study 2 to give us detailed reports of the types of activities and experiences they provide for their children in several different activity domains. We also asked them what types of skills and activities they are encouraging their children to develop. Finally, we asked them what they do with their children. We are just beginning our longitudinal data analysis.

As a first step in this process we tested whether parents provide different types of experiences for girls and boys. They clearly do in several of the activity domains we are studying.

**SHOW GRAPHS ON DIFFERENCES IN PROVISION OF OPPORTUNITIES:  
SPORTS****READING and MATH/COMPUTERS**

As the second step, we have used path analysis to determine whether the sex of child effects on the types of activities parents provide and encourage are mediated by the parents' perceptions of their children's ability and interests in each domain. These results are illustrated in the next overhead for the sport domain. Consistent with the mediational hypothesis, the sex of child effect on parental encouragement of participation becomes non-significant when the sex of child effect on parents' perceptions of their children's sport ability and interest is entered into the path analysis.

**(SHOW OVERHEAD ON MEDIATING PATH ANALYSIS)**

In conclusion, we have presented evidence of the influence of social factors on parents' perceptions of their children's abilities in various activity domains. We have focused on child sex as one potentially critical social factor and have presented data showing how a child's sex might influence parents' perceptions of their child's ability independent of the child's actual performance in the domain. We have also presented evidence that parents' beliefs do have an impact on children's developing self-concepts, and on the experiences parents encourage their children to have in various activity domains.

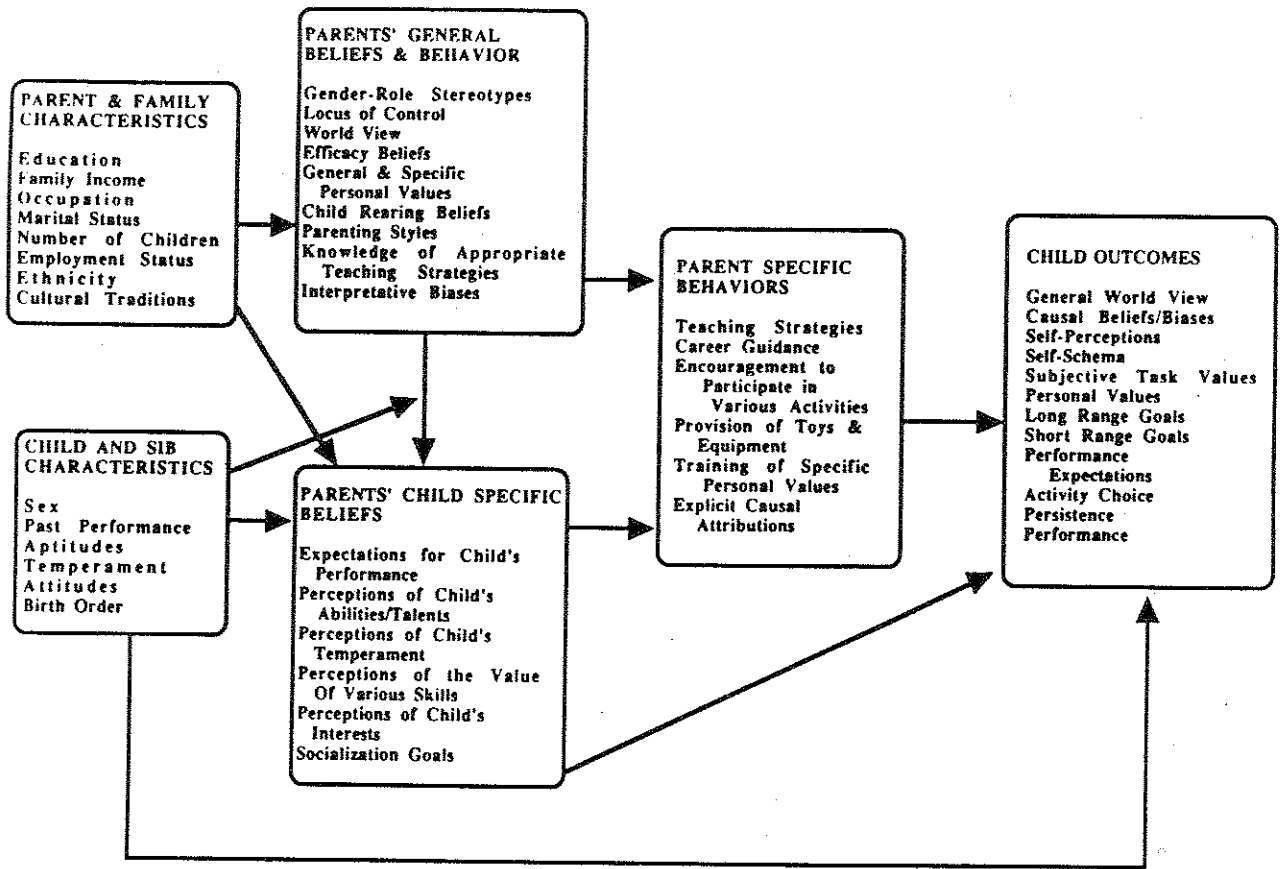
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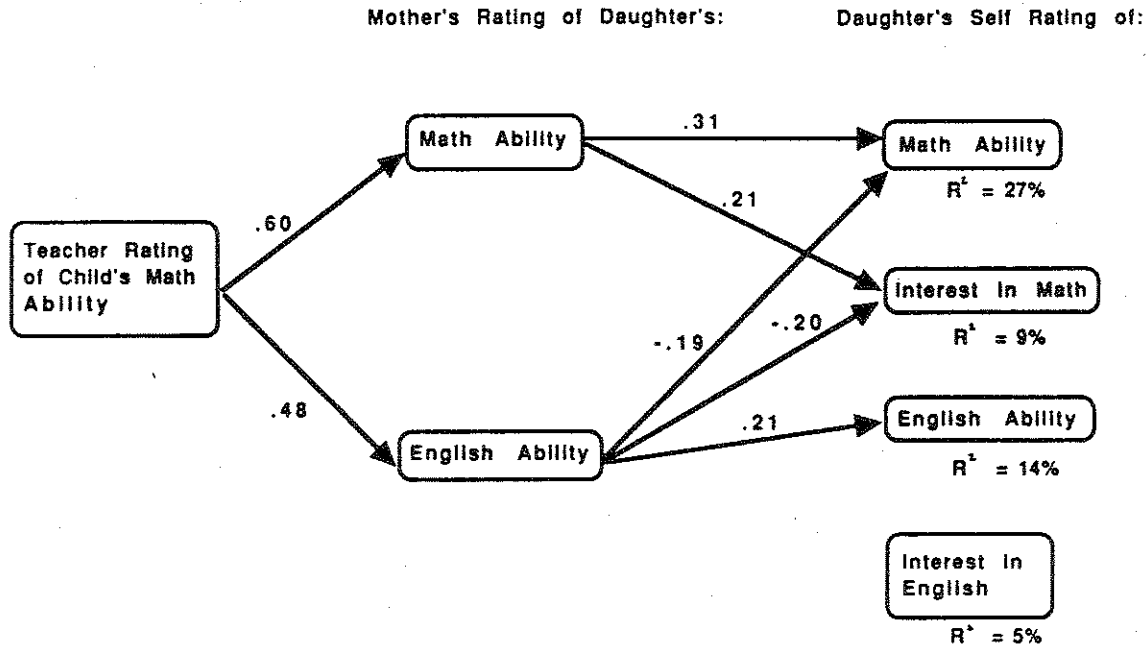
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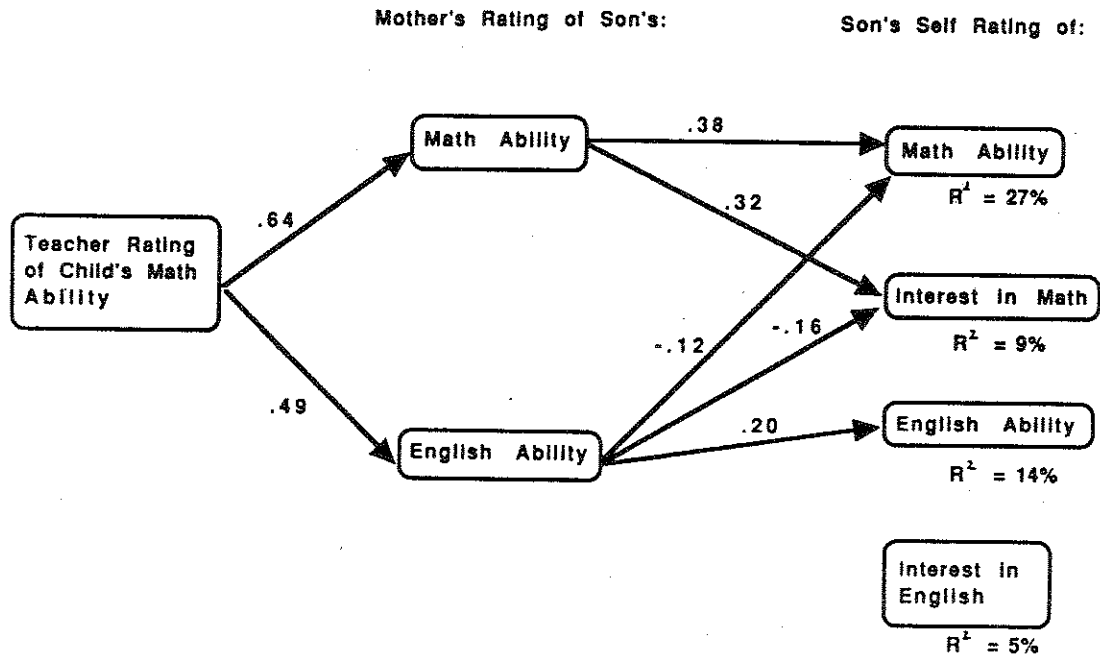
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Mother's Influence on Daughter's Self-Perceptions

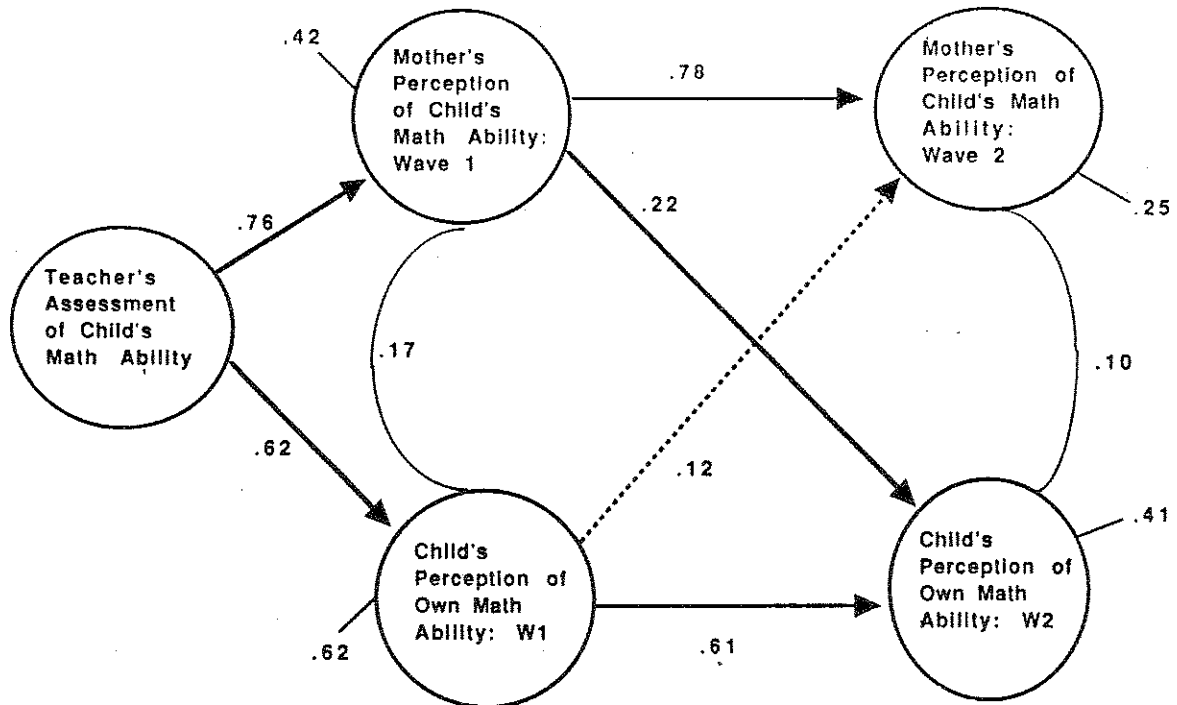


Mother's Influence on Son's Self-Perceptions



N = 920

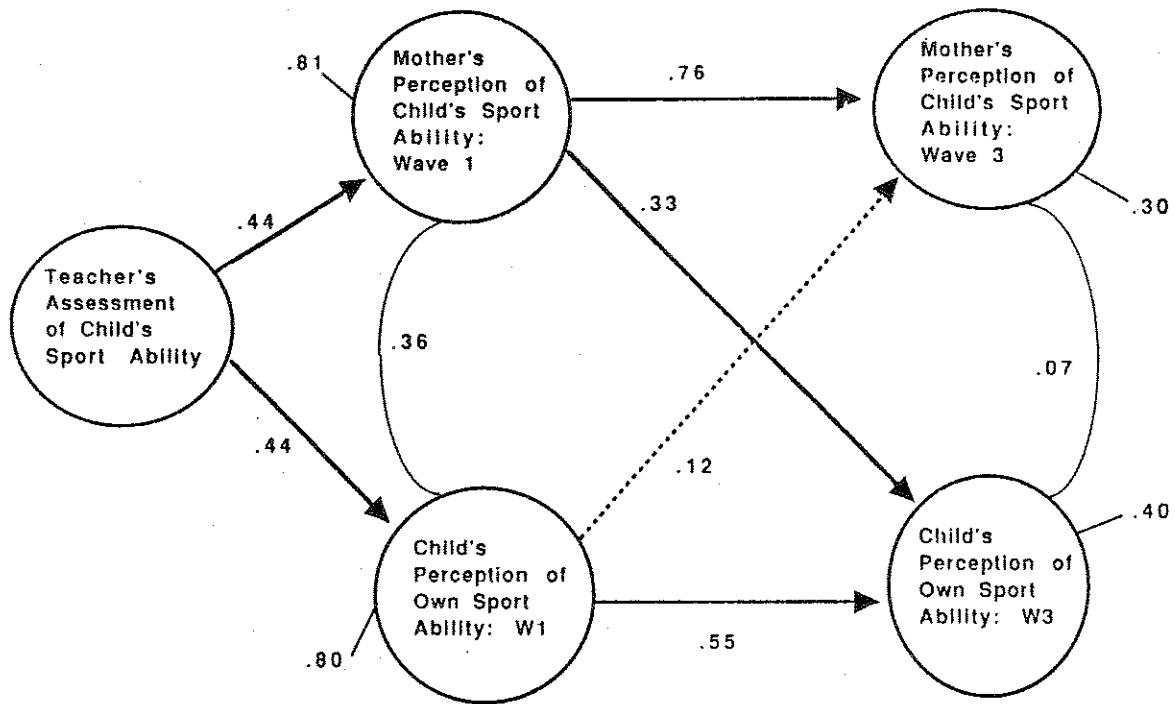
Cross Lagged Structural Equation Modelling of Causal Directions And Mediating Influence of Mother's Perceptions: Data for Sons



$\chi^2$  (df=82) = 150.19  
Goodness of Fit = .96

Note: Measurement Model Statistics Omitted

**Cross Lagged Structural Equation Modelling of Causal Directions And Mediating Influence of Mother's Perceptions: Data for Sons**



$\chi^2$  (df=32) = 51.61  
Goodness of Fit = .984

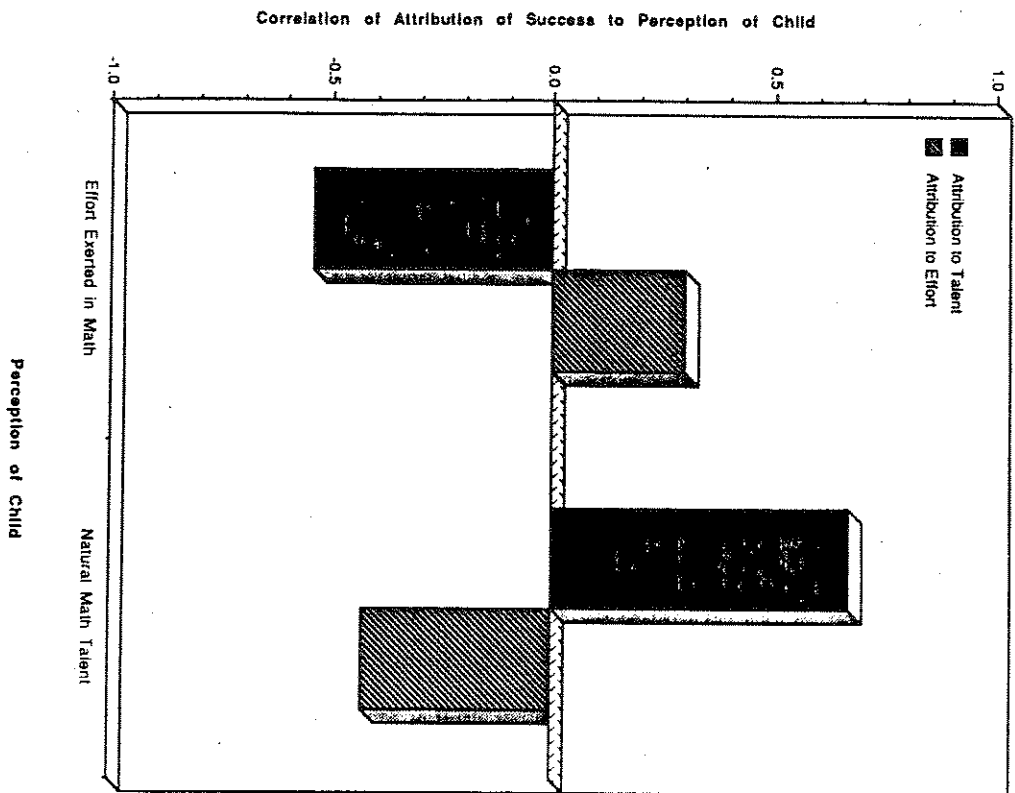
Note: Measurement Model Statistics Omitted

Table 1  
Sex of Child Effects on Parents' Perceptions

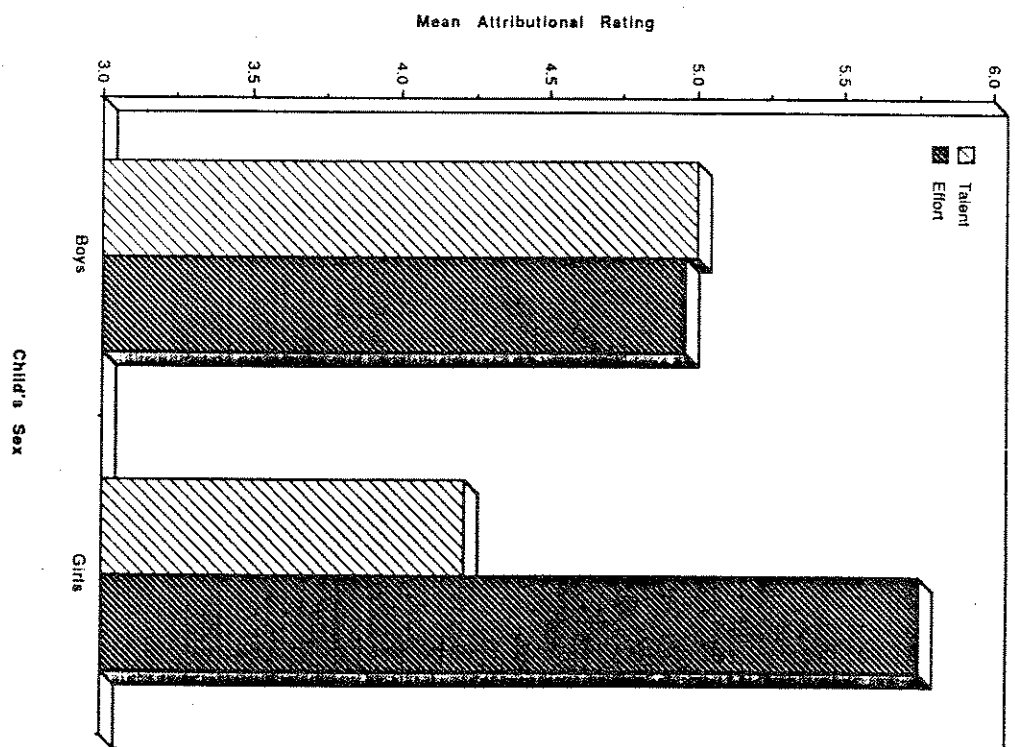
VARIABLES	DOMAINS								
	Math			English/Reading			Sports		
	Means Girls	Means Boys	E	Means Girls	Means Boys	E	Means Girls	Means Boys	E
<b>Adolescent Transition Study<sup>1</sup></b>									
Parent perception of current competence	5.45	5.40	<1.00	5.65	4.99	101.71***	4.84	5.22	25.75***
Parent perception of task difficulty	4.10	3.80	12.10***	3.73	4.24	39.20***	3.77	3.47	13.21***
Parent perception of natural talent	4.78	5.01	9.85*	5.03	4.51	48.76***	4.22	4.87	59.76***
Parent perception of future performance	5.36	5.34	<1.00	5.59	5.02	74.99***			
Parent perception of performance in career	5.17	5.42	11.17***	5.41	4.87	54.91***			
Parent perception of importance	6.38	6.50	9.21**	6.34	6.34	<1.00	3.80	4.10	12.90***
<b>Middle Childhood Development Study<sup>2</sup></b>									
Parent perception of current competence	5.38	5.34	<1.00	5.67	5.27	10.28***	4.50	4.98	16.41***
Parent perception of task difficulty	2.08	2.02	<1.00	1.64	2.01	8.33**	2.57	2.15	11.77***
Parent perception of natural talent	5.01	5.15	1.45	5.41	5.11	7.00**	4.31	4.74	12.35***
Parent perception of future performance	5.99	5.91	<1.00	6.36	5.95	19.13***	5.02	5.52	19.91***
Parent perception of importance	6.26	6.46	8.12**	6.65	6.63	<1.00	4.20	4.72	20.00***

Note: <sup>1</sup> Mothers of 6th graders, approximate N=900 <sup>2</sup> Parents of kindergarteners, 1st, and 3rd graders, approximate N=500.  
\*p<.05 \*\*p<.01 \*\*\*p<.001.

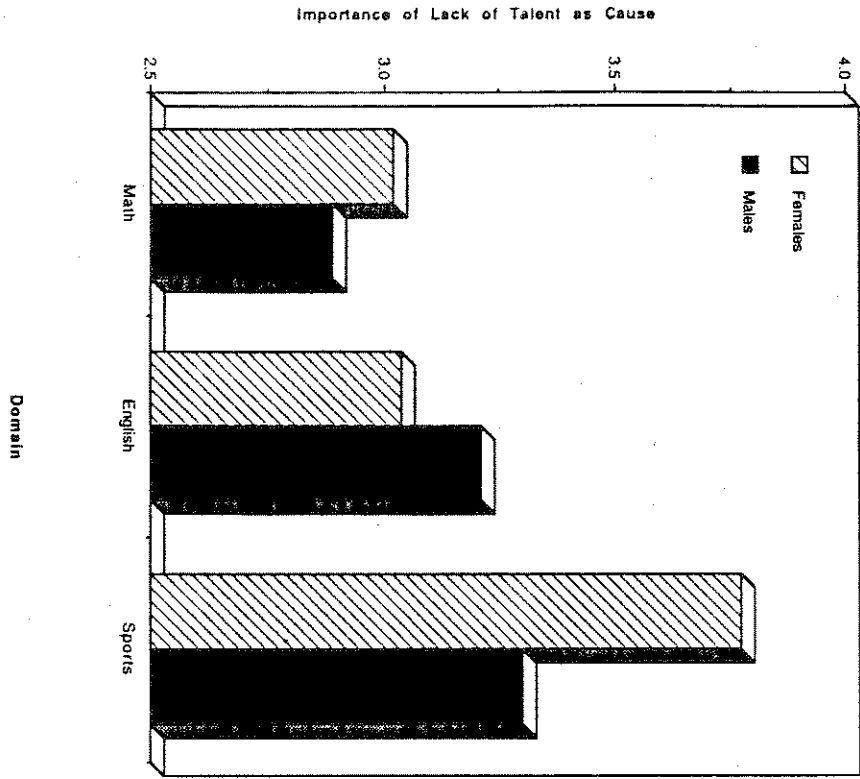
Relation of Causal Attribution for Child's Success in Math to Perceptions of One's Child's Effort and Talent in Math



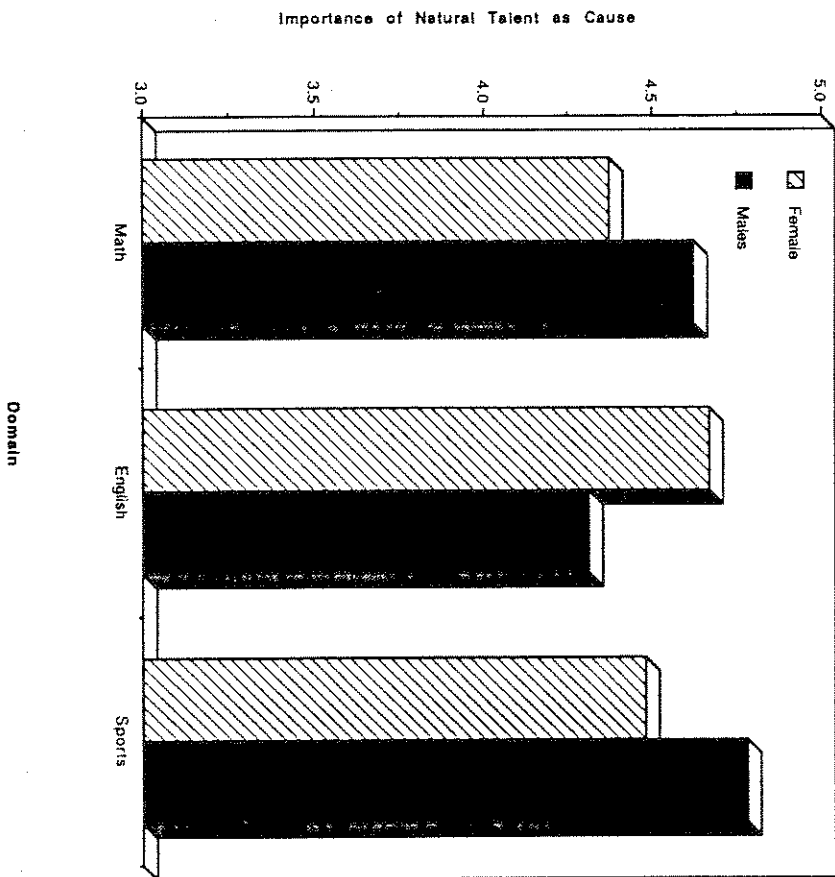
Mothers' Causal Attribution for Child's Success in Math



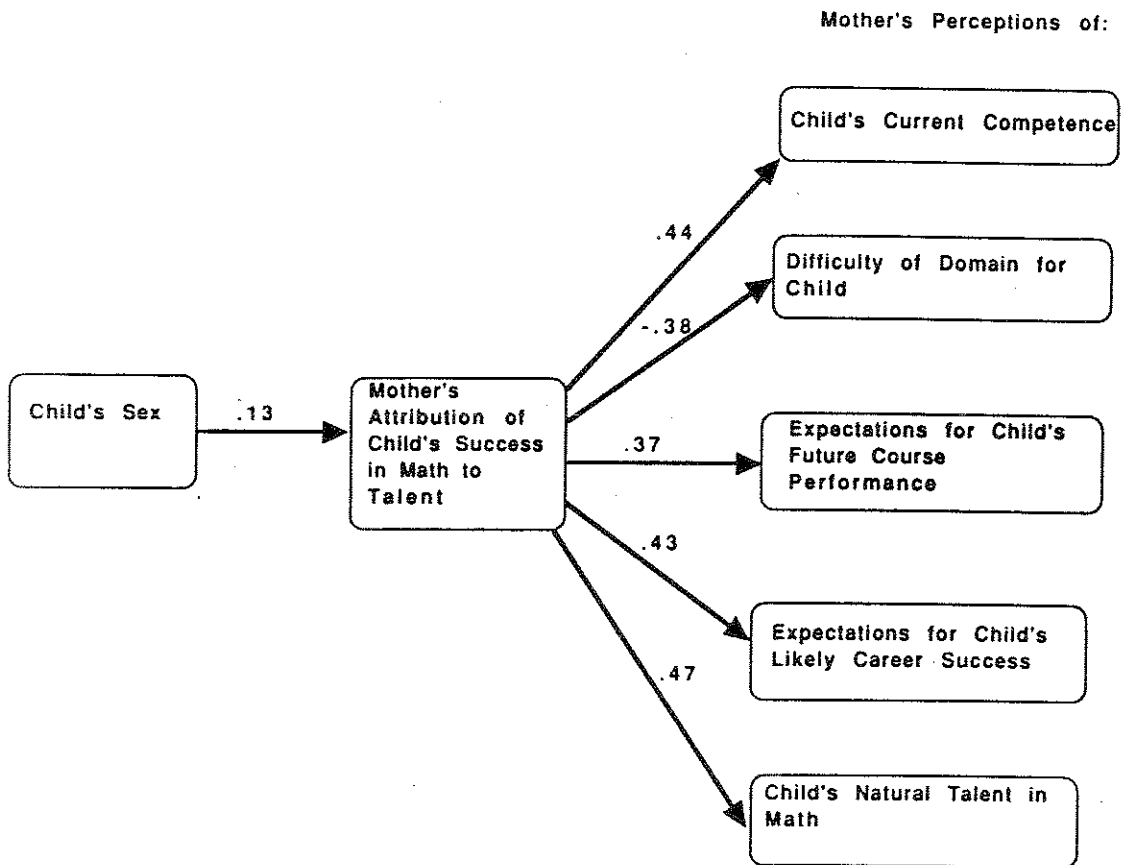
Parents' Causal Attributions for Child's Failure



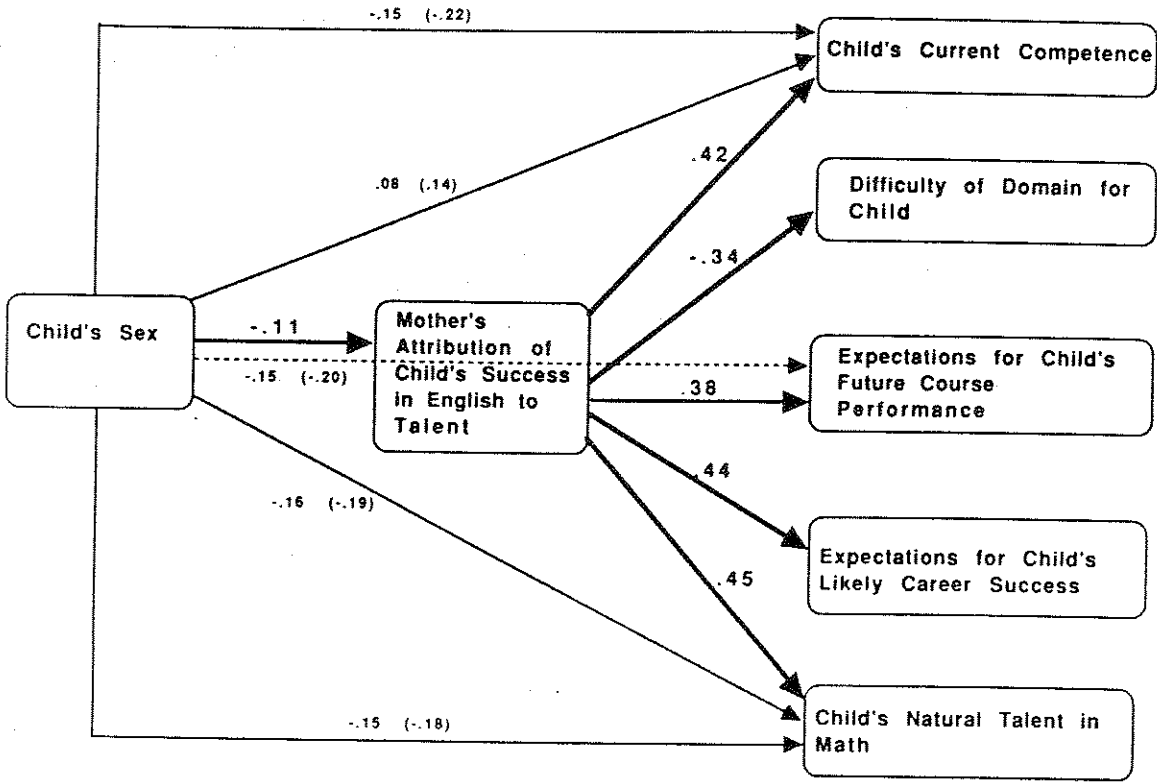
Parents' Causal Attributions for Child's Success



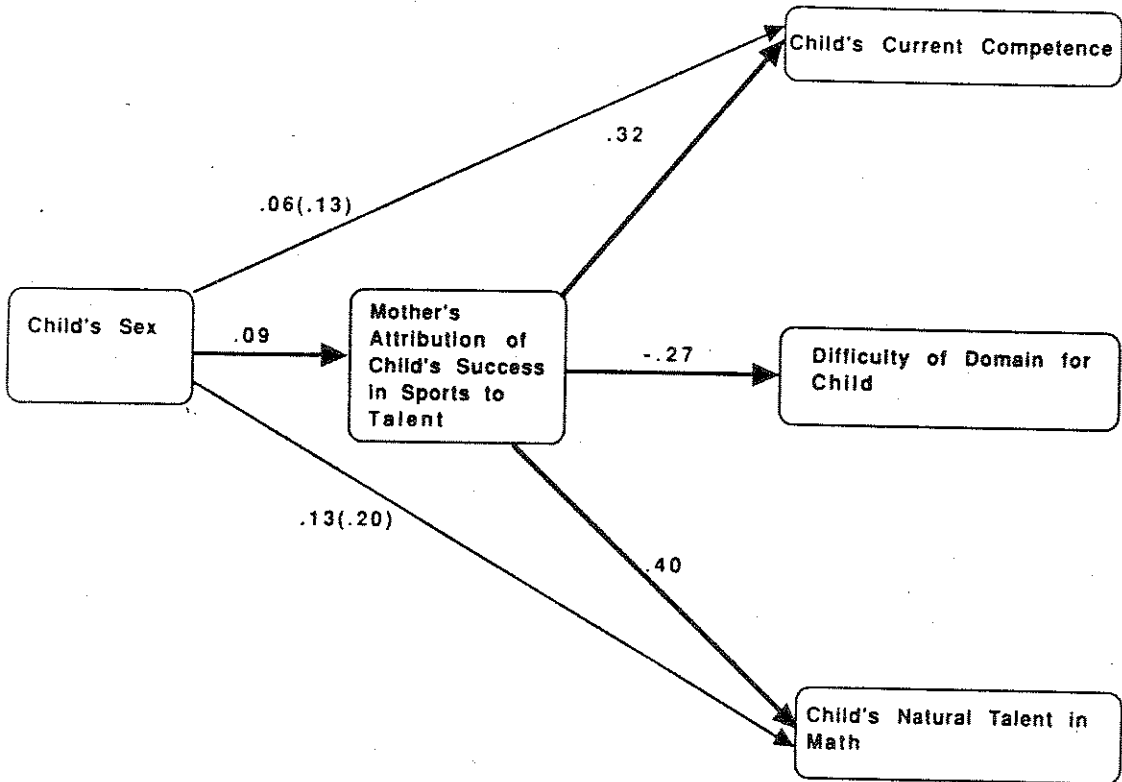
Parents' Rating of Child's Effort in Math and English



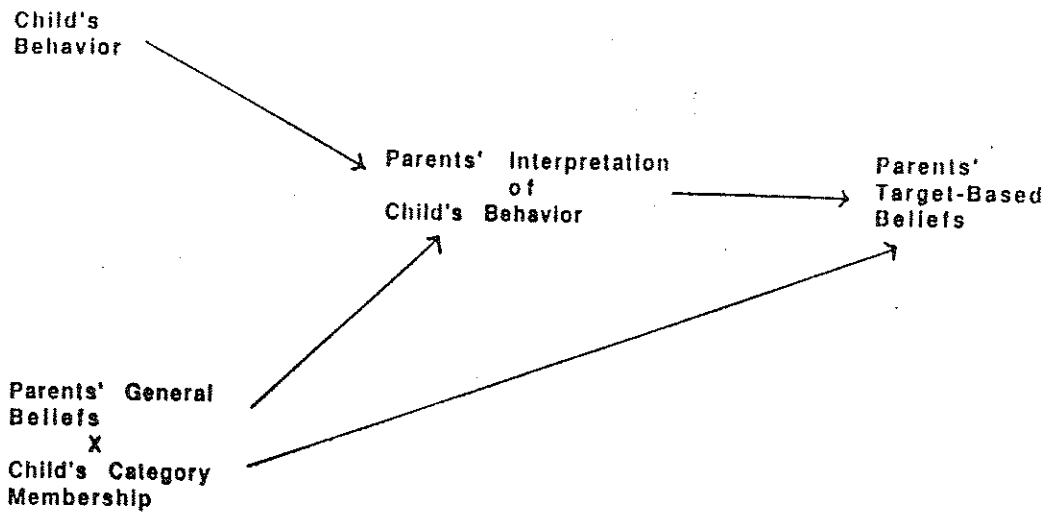
Mother's Perceptions of:



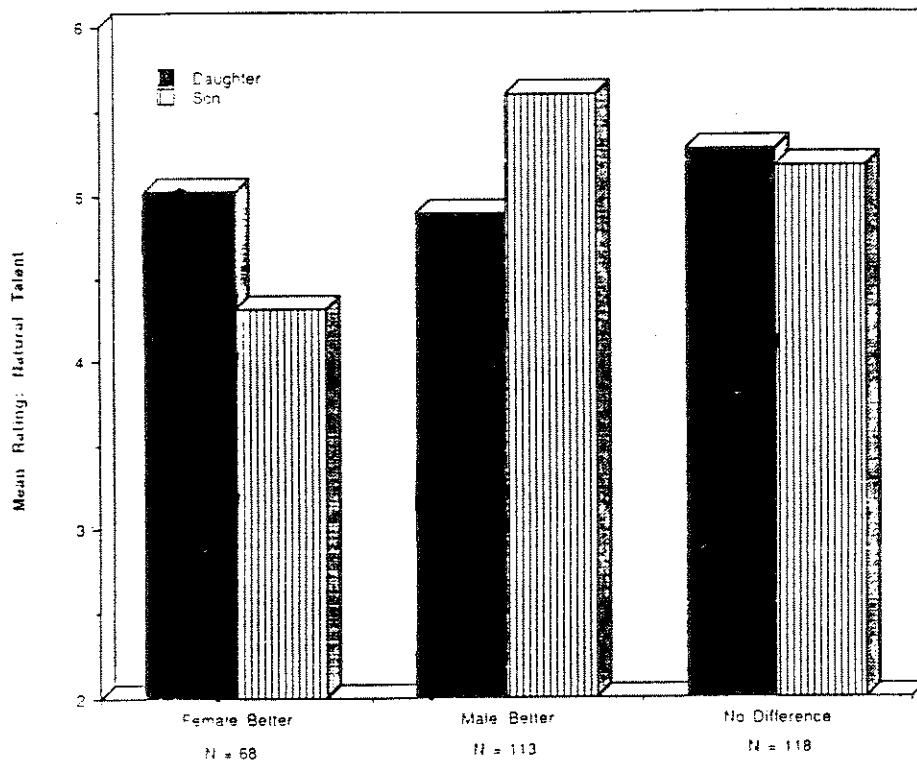
Mother's Perceptions of:





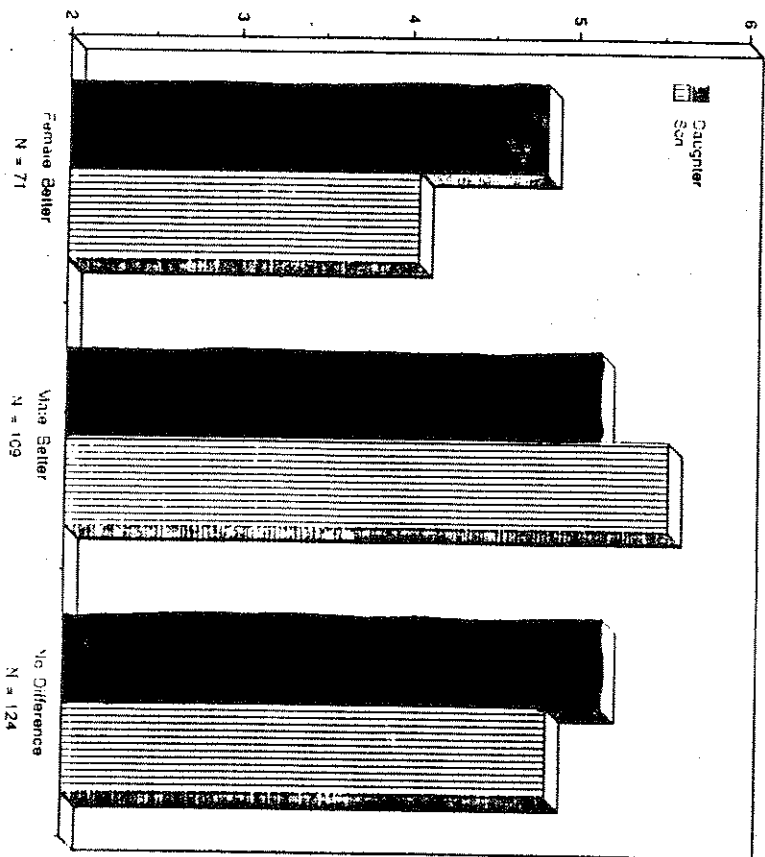


Mothers' Rating of Own Child's Natural Talent for Math



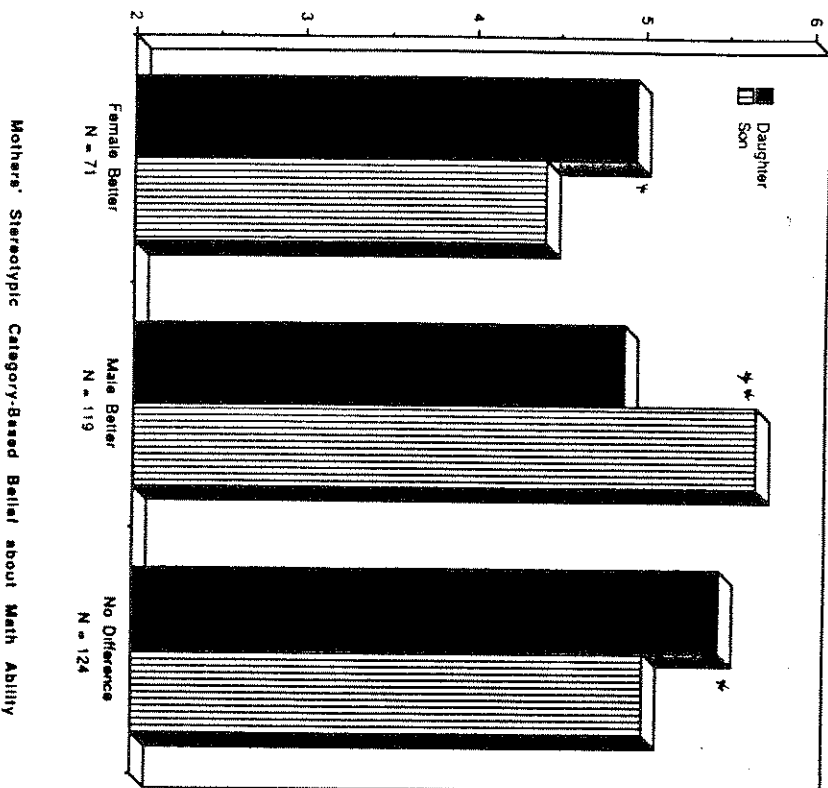
Mothers' Stereotypic Category-Based Beliefs about Math Ability

Mean Rating: Importance to Child



Mothers' Stereotypic Category-Based Beliefs about Math Ability

Mean Rating: Ease of Math

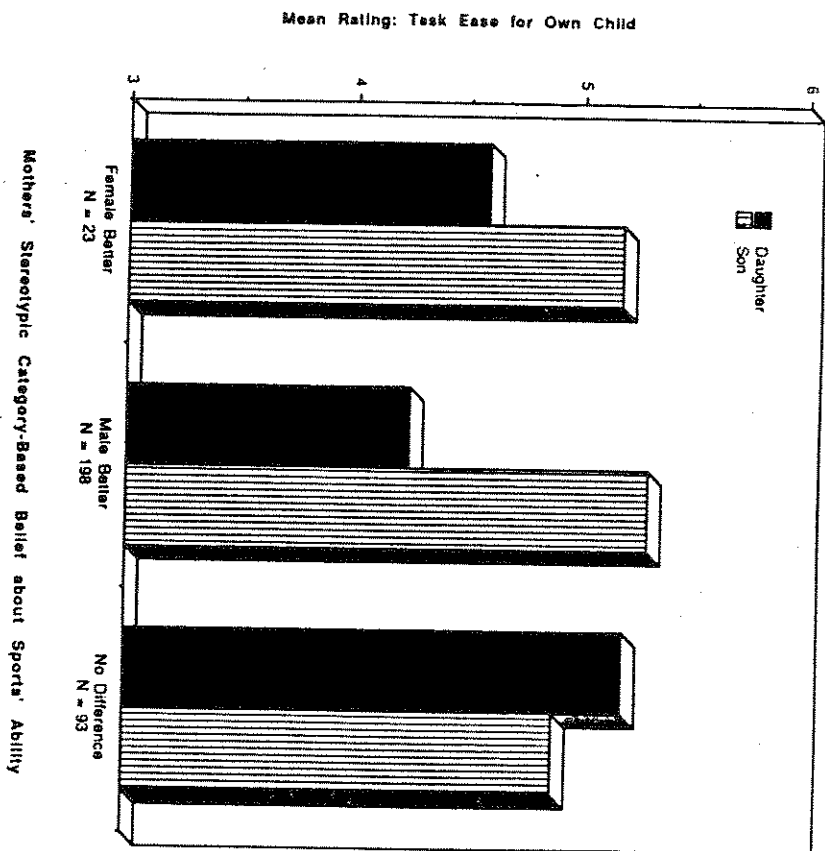


Mothers' Stereotypic Category-Based Beliefs about Math Ability

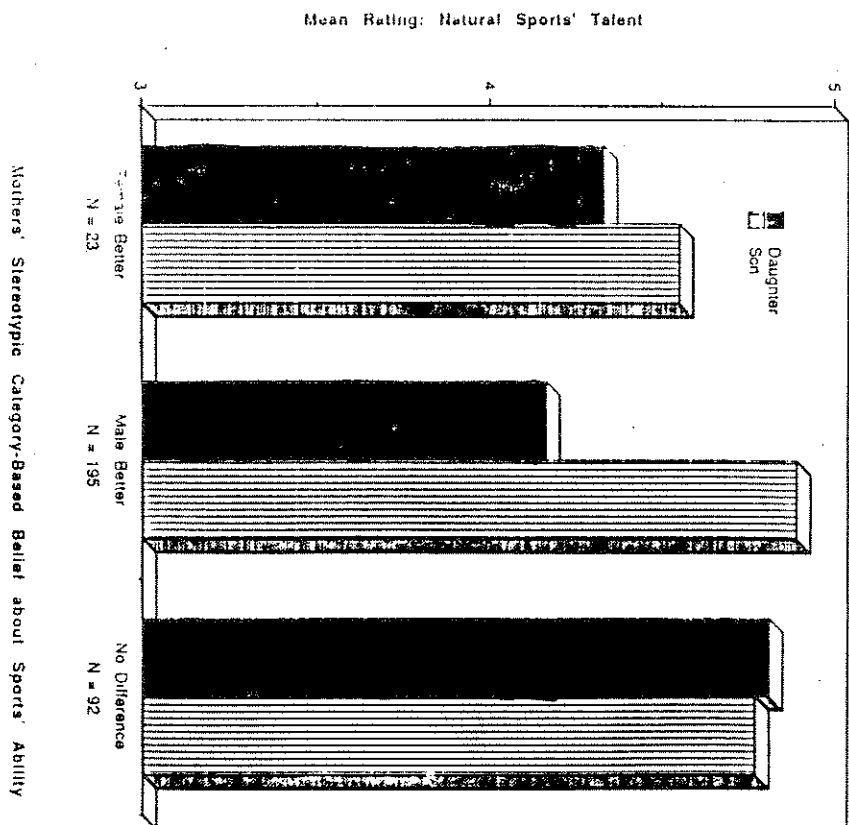
Mothers' Rating of Importance of Math Skill to Own Child

Mothers' Rating of the Ease of Math for Own Child

Mothers' Ratings of Sports' Ease for Own Child

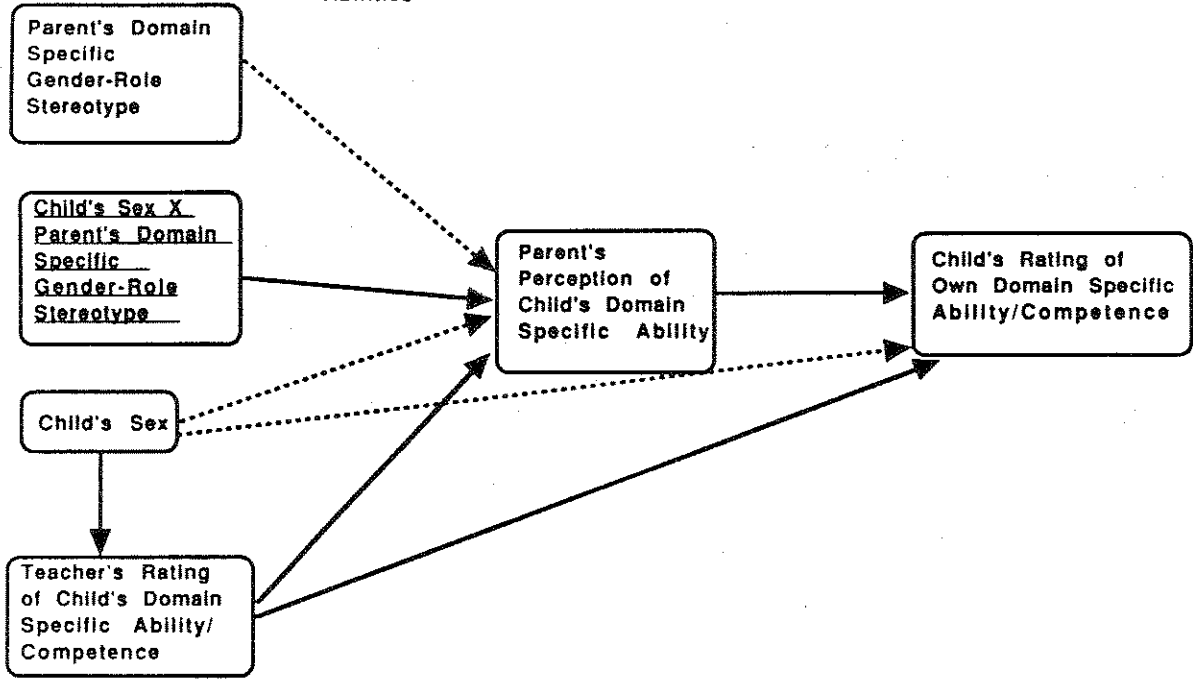


Mothers' Ratings of Own Child's Natural Talent in Sports

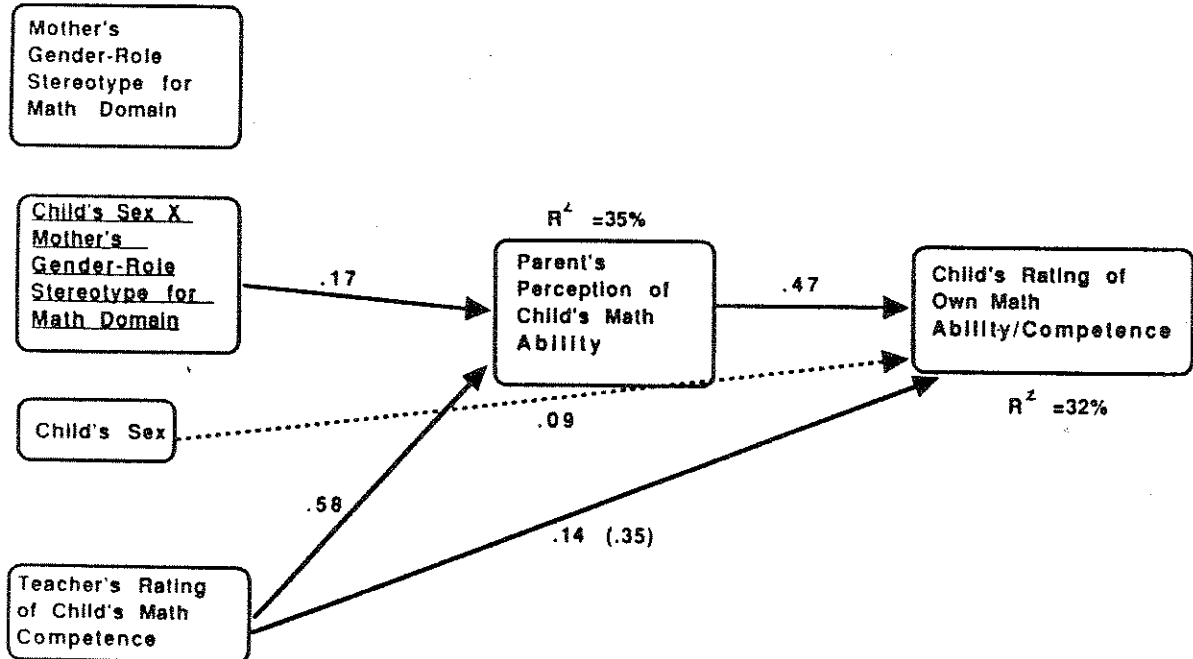


Mothers' Stereotypic Category-Based Beliefs about Sports' Ability

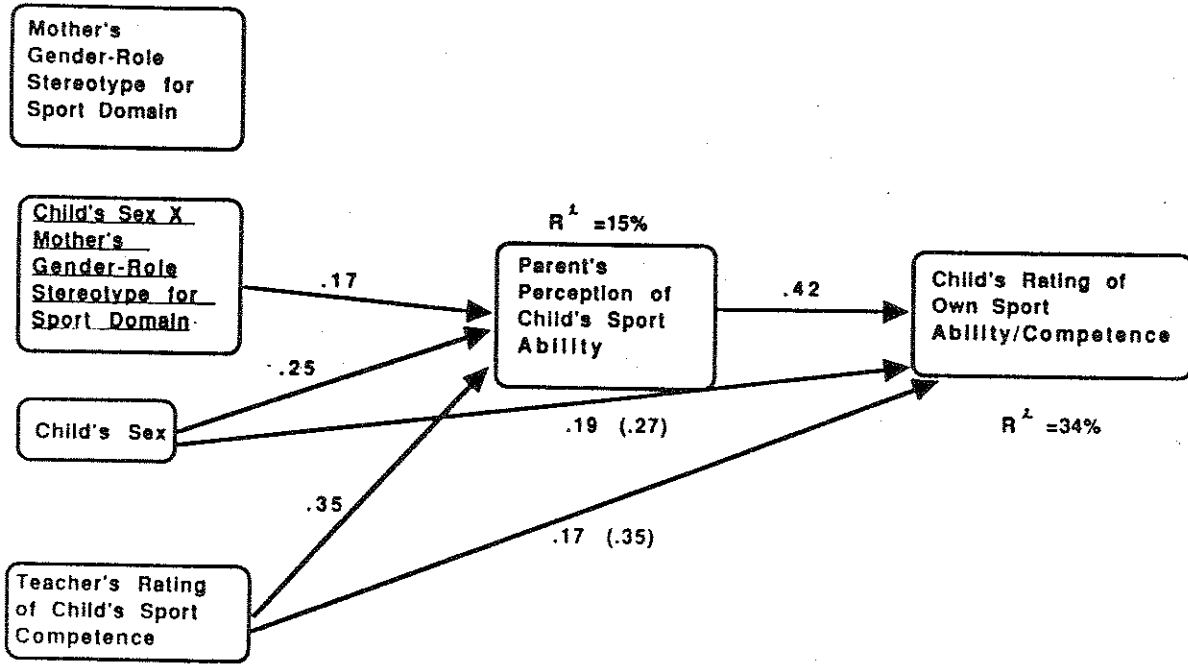
General Model of the Moderating Effects of Parents' Domain Specific Gender-Role Stereotypes on the Impact of Child's Sex on Parents' Perceptions of Their Child's Domain Specific Abilities



Moderating Effect of Mother's Gender-Role Stereotype for the Math Domain on the Impact of Child's Sex on Mother's Perceptions of her Child's Abilities in Math

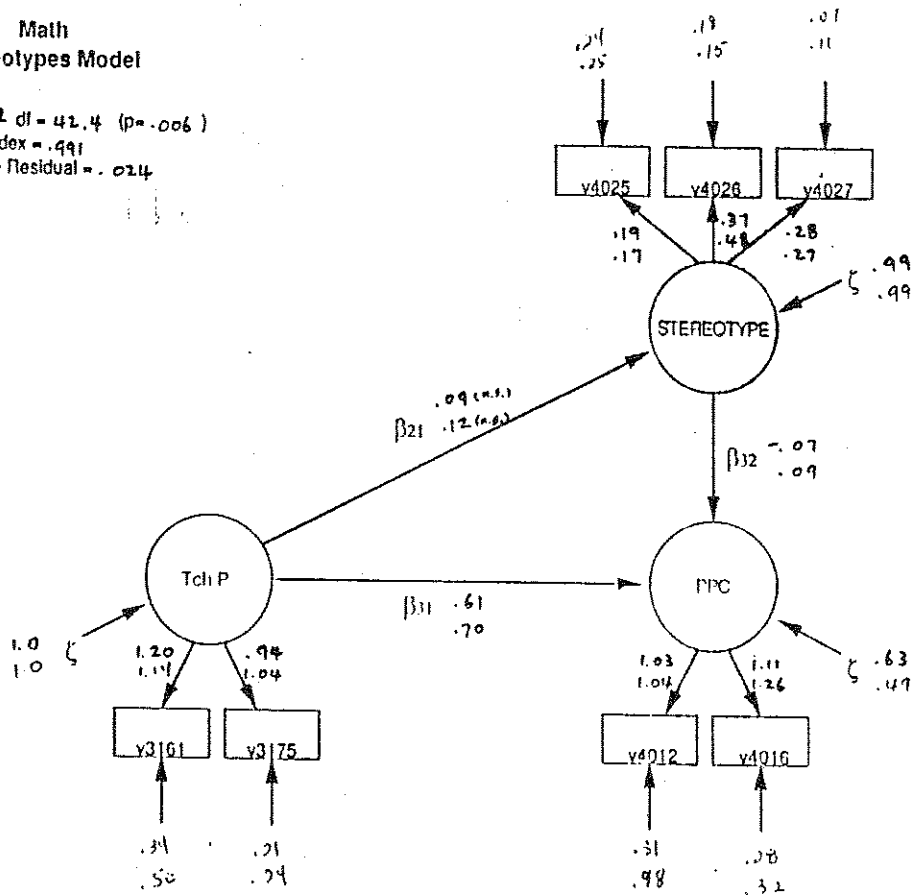


Moderating Effect of Mother's Gender-Role Stereotype for the Sport Domain on the Impact of Child's Sex on Mother's Perceptions of her Child's Abilities in Sports



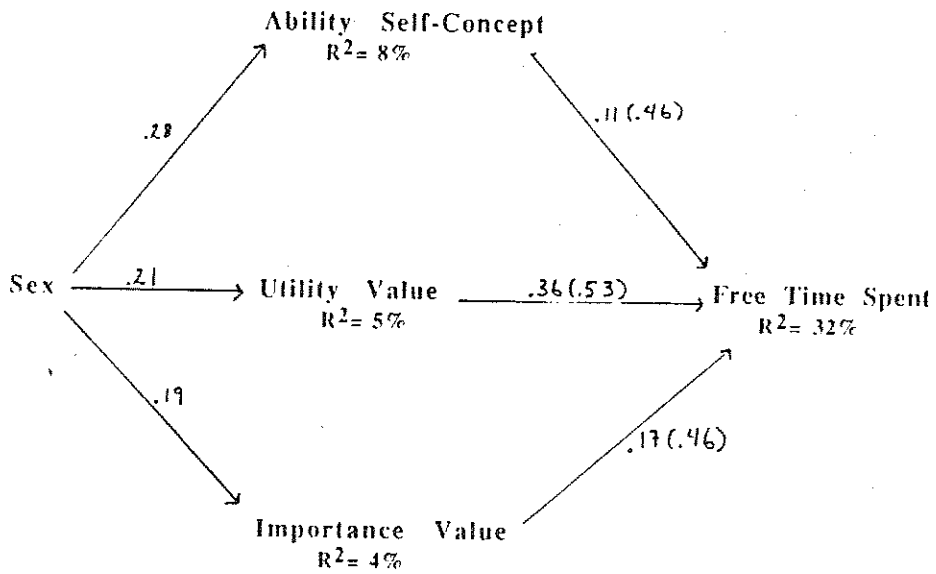
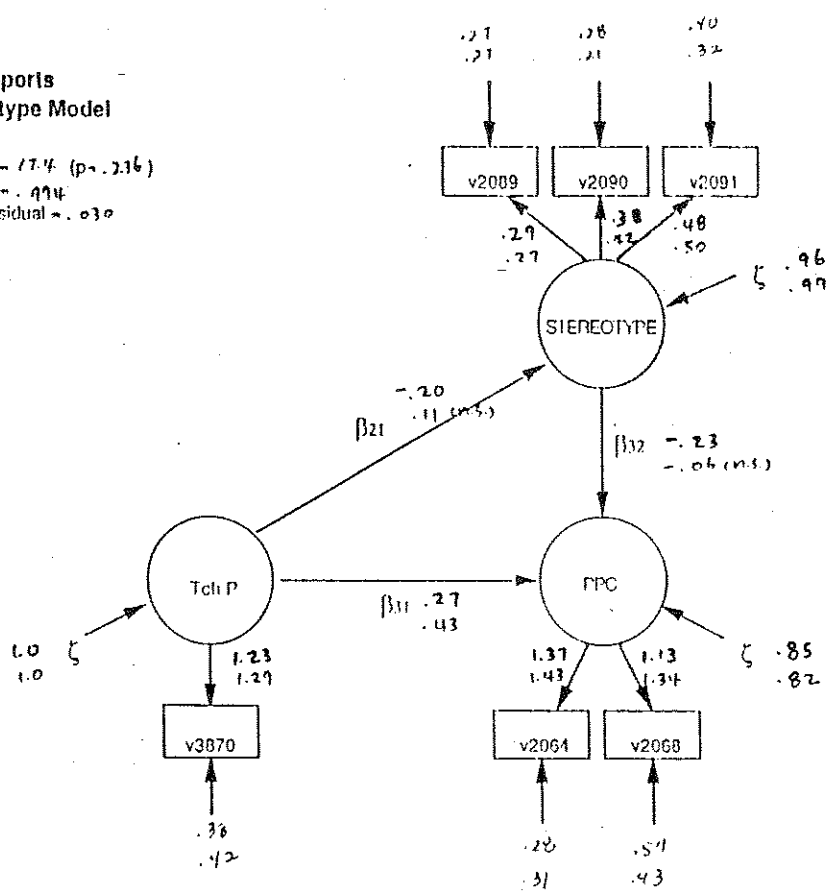
Math Stereotypes Model

Chi-square with 21 df = 41.4 (p = .006)  
 Goodness of Fit Index = .991  
 Root Mean Square Residual = .024

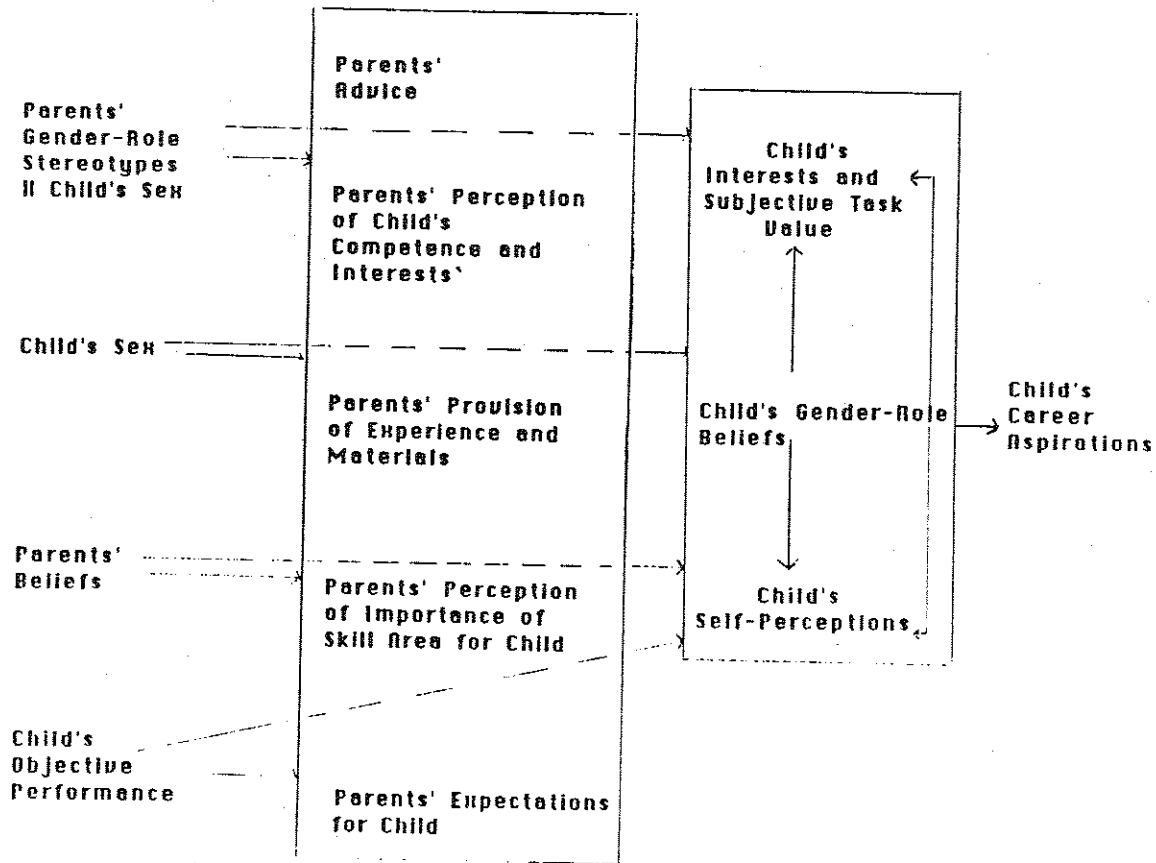


**Sports  
Stereotype Model**

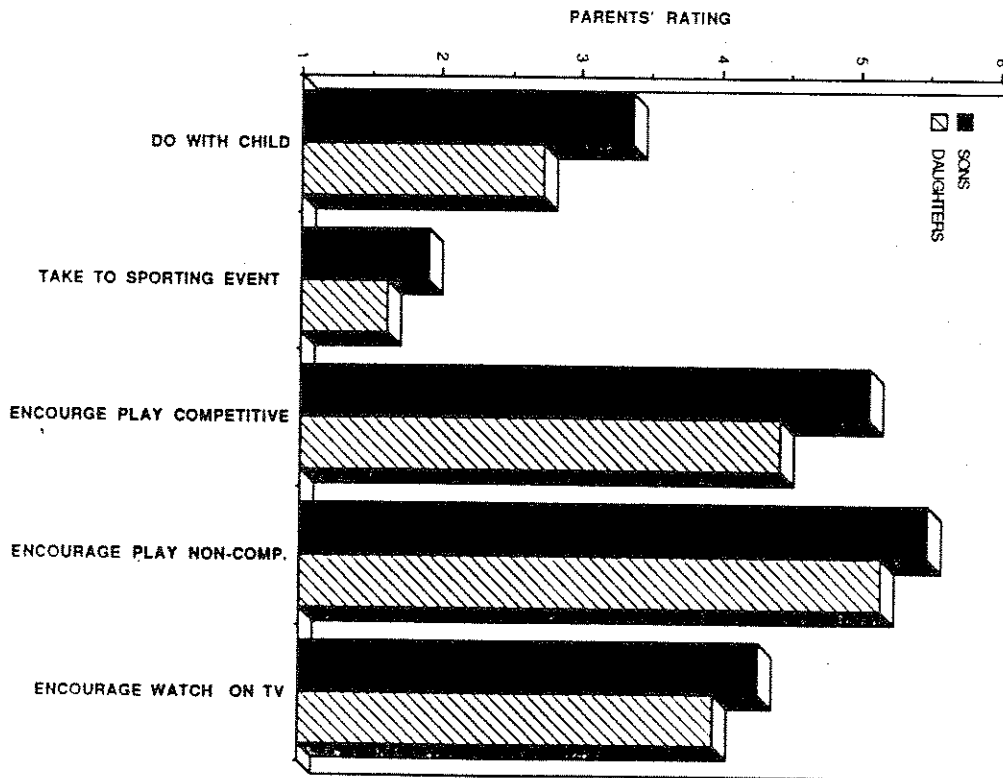
Chi square with 14 df = 17.4 (p = .236)  
 Goodness of Fit Index = .974  
 Root Mean Square Residual = .030



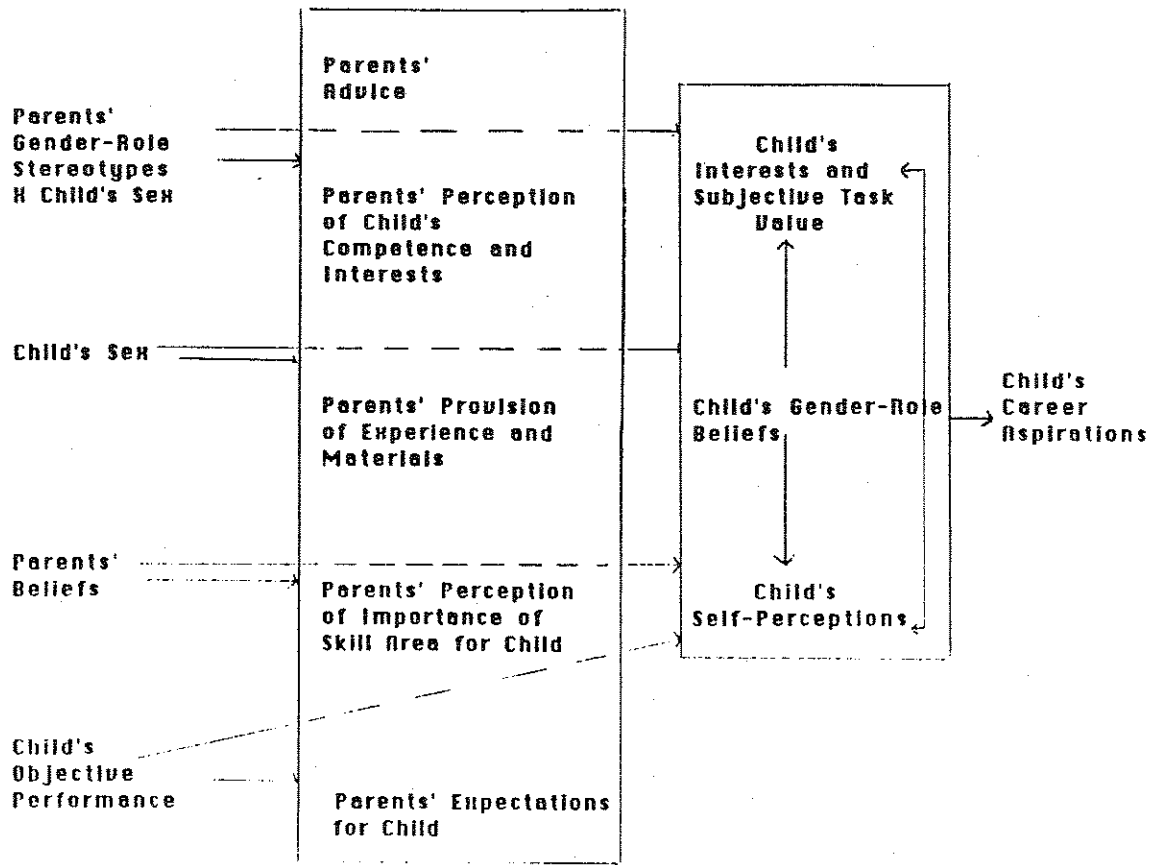
Correlation: Sex - Time Spent = .14  
 Partial Correlation: Sex - Time = .002  
 (controlling mediating variables)



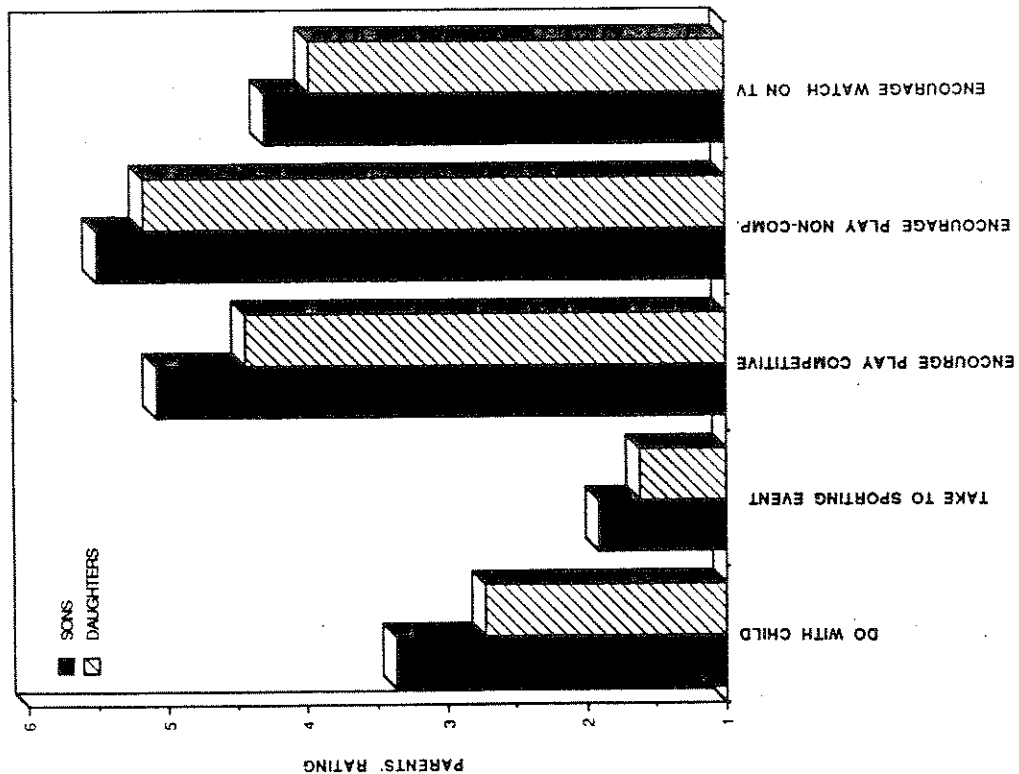
Wave 2 Parent Data  
from Middle Childhood Study



PARENTS' RATING OF EXTENT TO WHICH THEY DO EACH TYPE OF SPORT ACTIVITY WITH CHILD

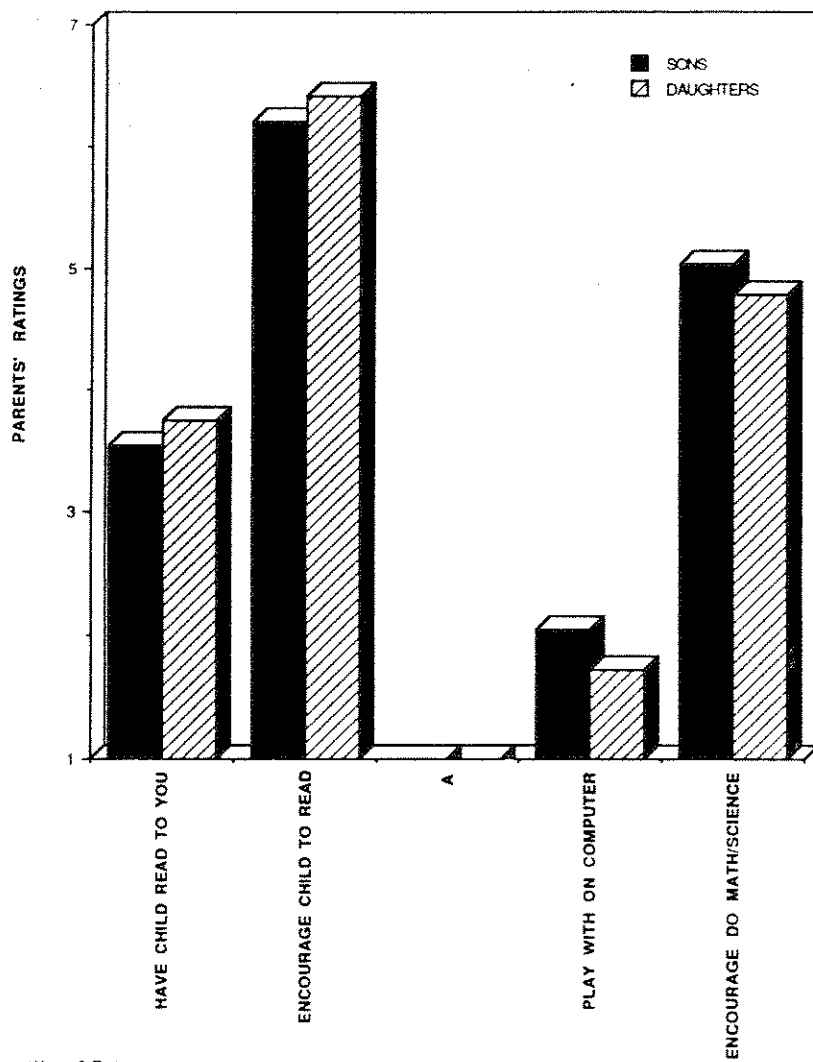


PARENTS' RATING OF EXTENT TO WHICH THEY DO EACH TYPE OF SPORT ACTIVITY WITH CHILD





PARENTS' RATING OF EXTENT TO WHICH THEY DO EACH ACTIVITY WITH CHILD



Wave 2 Data  
From Middle Childhood Study

Path Analysis on the Mediating Role of Parents' Perceptions of Their Child's Ability and Interest in Sports

