

**Factors Influencing the Development of  
Academic Anxiety in Children:  
A Path Analytic Model**

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## Introduction

Children with learning problems and other school adjustment problems are more anxious than children who succeed academically (Hill, 1972). High anxiety in children produces motivational and learning strategies that interfere with learning, resulting in performance deficits that, in turn, lead to further increases in anxiety over time. Despite the obvious importance of these debilitating effects of anxiety on children's academic progress, very little is known about the development and etiology of anxiety. The goal of this paper is to examine the parental and child factors linked to the development of academic anxiety in children.

Achievement, or test, anxiety has been explored rather extensively, especially by educational researchers. It is a special case of trait anxiety because the stimuli, experiences, and responses of test anxiety are as varied as those of general anxiety (Sieber, 1980). Yet, because test anxiety is specific to school evaluative experiences, researchers investigating the etiology of test anxiety have focused on somewhat different causes from those explored by general anxiety researchers.

Test anxiety is generally defined as a set of responses, cognitive, behavioral, and emotional, that accompany concern about possible failure (Sieber, 1980). According to Spielberger's (1966) state-trait model of test anxiety, any evaluative situation (taking a test, being called on by a teacher, etc.) results in both heightened emotional arousal (state anxiety) and cognitive appraisal of one's capacity to respond correctly or incorrectly. These responses, then, lead to a variety of coping (or non-coping) responses. Many researchers have focused on these affective, cognitive, and behavioral components of test anxiety, as well as treatments to relieve the symptoms of anxiety; fewer researchers have focused on etiologic factors.

Researchers exploring the development of test anxiety have found that children's total anxiety scores increase over the elementary and secondary school years (Hill, 1972). Further, the negative correlation between anxiety and achievement test scores increases from almost 0 at Grades 1 and 2 to -.44 in Grades 5 and 6 (Hill, 1972). Wigfield and Eccles (1989) suggest that children become anxious in evaluative situations when they experience failure and critical reactions from adults. This anxiety, in turn, leads to further failure resulting in motivation to avoid failure rather than approach success. Further, Wigfield and Eccles propose that these failure experiences have a stronger impact on children as they get older when ability self-perceptions become more stable, and children tend to have less optimistic expectations for success in all academic areas (see Wigfield & Eccles, 1989, for a review of this literature). Consequently, lack of ability in school (or the perception that this may be true) may be a key feature in the development of test/academic anxiety.

In examining the parental correlates of anxiety in children, Adams and I. G. Sarason (1963) reported that high school students' general anxiety relates to their mothers' general anxiety, with a stronger relationship for girls than boys. This finding indicates that there is a relationship between parent and child anxiety. Similarly, Perry and Millimet (1977) found that there were modest differences ( $p < .15$ ) between the parents of low and high anxious eighth graders on a measure of anxiety, with parents of high anxious children having slightly higher scores than parents of low anxious children.

In one early study that focused on etiologic factors, Sarason, Davidson, Lighthall, Waite, and Ruebush (1960) proposed that test anxiety is a personality characteristic that results from the child's reactions to evaluative feedback during the early school years. High levels of test anxiety develop

when the child's achievement does not live up to the parents' unreasonably high expectations. Consequently, the child is frequently judged negatively by the parent. The child, in turn, internalizes these negative judgments and becomes anxious that he/she will fail in evaluative situations. Further, the high level of threats the parents use with their child leads the child to engage in behavior aimed at pleasing the parents. The child develops either great dependence on adult support in evaluative situations or avoids these situations altogether.

Hermans, ter Laak, and Maes (1972), in observing high- and low-anxious children working with their parents on a problem-solving task, found that parents of high-anxious children provided less support for their attempts, showed fewer reactions when their children expressed insecurity, and withheld more reinforcements after correct answers than parents of low-anxious children who were more supportive and helped their children find the right strategies to use. The authors further observed that parents of high-anxious children often taught task-irrelevant or task-inappropriate behaviors to solve the problem. Because these strategies are ineffective in solving problems, Hermans et al. conclude that high-anxious children come to rely on parental and adult supports or avoid problem-solving tasks entirely.

Perry and Millimet (1977) also examined the differences in child-rearing styles of parents of low- and high-anxious eighth graders. They found that parents of low anxious children were less worried about their children and interpreted their experiences with their children as less problematic than did parents of high anxious children. Surprisingly, Perry and Millimet also found that parents of low-anxious children reported that they punished their children more frequently than parents of high-anxious children. The low anxious children reported, however, that they felt their parents were fairer in

their punishments and reported feeling closer to their parents than high anxious children did. The researchers found no differences between the groups of children on the amount of freedom and independence their parents gave them, nor were there differences on reported parental control over the children's lives.

Lorion, Cowen, Kraus, and Milling (1977) also examined correlates of child-rearing styles of parents of children identified by their teachers as being at risk for school maladjustment. Using teacher ratings of family characteristics, Lorion and his colleagues identified two groups of children: one consisted of children whose teachers indicated they were "under family pressure to succeed", the other consisted of children whose teachers indicated there was a "lack of educational stimulation in the home". In examining teacher ratings of children on school adjustment problems, the researchers found that children whose parents pressured them to achieve academic success were significantly more shy, anxious, and immature in coping with school demands than children whose parents failed to provide adequate academic stimulation. Similar results were reported in an additional study presented by Lorion et al. concerning children whose parents were rated "overprotective" by their teachers. Boike, Gesten, Cowen, Felner, and Francis (1978) found similar results with a sample of 468 primary grade children. These researchers found that teachers who rated children high under family pressure to succeed also rated them significantly higher on anxiety than children whose families had no family problems.

Using a social learning theory model of anxiety, Krohne (1980) suggests several parental child-rearing practices that may impact on child expectancies in an anxiety-provoking situation. These parenting practices relate directly to a particular expectancy. Thus, Krohne proposes that competency expectancy,

whether or not the child feels competent to tackle a problem at hand, is affected positively by parental supportiveness and negatively by parental restrictiveness. Consequence expectancy, the consequences children believe will occur if they follow a particular action, is affected by positive versus negative parental feedback. To test this model of parental child-rearing behavior and the development of anxiety, Krohne and his colleagues (as cited in Krohne, 1980) asked 12-16 year-old children to assess their parents' parenting styles. They were particularly interested in children's assessment of how much positive and negative reinforcement their parents gave them, the consistency of their parents' feedback (how often similar behaviors are rewarded at one time and punished at another), and the amount of support versus restriction they perceived their parents gave them. The researchers found that perceived maternal inconsistency was positively correlated with anxiety in boys but not girls, perceived restrictiveness of both parents was positively correlated to anxiety in boys and girls, and perceived negative feedback (punishment) from fathers was positively correlated with anxiety for boys and girls.

In a more recent study, Kohlmann, Schumacher, and Streit (1988) also examined the effects of maternal and paternal support and inconsistency, as perceived by their 12-14 year old children, on their children's anxiety. The authors found that children's anxiety ratings were correlated with perceived maternal and paternal inconsistency in parenting style for both boys and girls. Further, the authors proposed that parental support acts as a buffer in the development of anxiety in children, either by partially reducing the effect of anxiety on the symptoms that may emerge (e.g., anxiety no longer affects academic performance) or by totally neutralizing the effect of anxiety. To examine this theory, Kohlmann et al. dichotomized all the child-rearing

dimensions to form low and high levels. Then, a standard self-report measure of child anxiety was entered as the dependent variable in a 2 (high/low inconsistency from mothers) x 2 (high/low inconsistency from fathers) x 2 (high/low support from mothers) x 2 (high/low support from fathers) ANOVA. The results indicate that perceived high maternal inconsistency is associated with anxiety in both boys and girls. Additionally, for girls, but not boys, perceived paternal support significantly lowers the negative effects of maternal inconsistency on girls' anxiety ratings.

In summary, the researchers cited above examine several parental correlates of anxiety in children. Besides parental anxiety, amount of parental warmth or supportiveness appears related to anxiety in children such that high amounts are related to children's reports of less anxiety. Further, the amount of control and/or the restrictiveness of the parent is also related to the development of anxiety: parents who are overly controlling or very restrictive tend to have children who report more anxiety. Similarly, excessive, negative, and inconsistent punishments by parents also appears related to increased levels of anxiety in children. Finally, increased parental pressure to succeed, especially in academics, appears related to the development of anxiety in children. It is interesting to note that some researchers rely on parental or teacher reports for measurement of these variables, whereas others rely on children's self-reports or perceptions. No researchers examined such variables as parental supportiveness or restrictiveness, for example, using both children's and parents' perceptions.

This study investigates the associations between parent's self-reported anxiety level, their parenting style, and family interaction style and changes in children's self-reported anxiety over a two-year period. The specific parent variables under investigation are: parent anxiety, parent decision-making

style (authoritarian vs. democratic), parent ability to influence their child, family cohesiveness and warmth towards the child, and family competitiveness. Children's perceptions of their parents' pressure to succeed academically and their perceptions of how warm and close their parents are towards them will be examined as mediators in this model. In order to control for differences in children's ability levels, teacher ratings of children's ability will be entered as a control variable. Further, some of the literature cited above suggests that parental correlates of the development of child anxiety differs depending on child and parent gender. Consequently, the associations between the parental correlates and child anxiety will be explored separately for mothers and fathers and boys and girls.

Finally, all possible moderated relations among the predictors (21 interactions) will be tested for significance in predicting child anxiety. It is predicted that parents with high anxiety who endorse a high level of authoritarian decision-making, low parental influence, low family cohesiveness and warmth, and high family competitiveness will have children who report high levels of anxiety. Further, high parental anxiety, authoritarian decision-making style, low parental influence, low family cohesiveness and warmth, and high family competitiveness will also interact with child perceptions that the parent is cold and distant from him/her and that the parent puts high pressure on him/her to succeed in school in predicting high child anxiety.

## Methods

### Sample

The data for this study were obtained from a large-scale longitudinal study conducted by Eccles and her colleagues (Eccles, Wigfield, & Blumenfeld, 1984; Eccles, Blumenfeld, Harold, & Wigfield, 1990) at the University of



Michigan. The study was conducted in 12 schools, in four primarily white, middle class school districts in midwestern suburban communities. In the large-scale study, groups of children in kindergarten, first, and third grades were administered questionnaires and interviews; to date, these children were followed for 4 years at which time the cohorts were in third, fourth, and sixth grades. The children, approximately two thirds of their parents, and their teachers participated by completing questionnaires and interviews annually. The authors of this large-scale study examine many issues, including children's achievement self-perceptions and activity choices in various domains and the roles that parents and teachers play in socializing these beliefs.

As part of the large-scale longitudinal study, parents were asked questions about their beliefs about themselves and their children and their activities all 4 years of data collection. For purposes of this study, I will examine questions from the last 2 years of data collection (Time 1 and Time 2). I will examine the data from the oldest students in these 2 years of data collection (fifth and sixth graders). Of the 357 children who had questionnaire data for Time 1 and Time 2, 154 mothers (71 girls, 83 boys) and 96 fathers (44 girls, 52 boys) also had questionnaire data for the two time periods.

#### Measures

Table 1 contains a listing of all variables used in constructing each measure. All measures used 7-point Likert scales with low, middle, and high endpoints labeled except where noted. Reliabilities presented are Cronbach alphas.

#### Child measures

Anxiety. Among the achievement-related questions administered to the children were a set that asked the students how much they worry about

doing badly in math and reading and how nervous they are when taking a test and how fast their hearts beat when taking a test. These same questions were asked at Time 1 and Time 2. For both years, these anxiety constructs had good reliability ( $\alpha=.77$  for both years), with means of 3.96 ( $SD=1.28$ ;  $N=393$ ) and 3.84 ( $SD=1.30$ ;  $N=357$ ) respectively for Time 1 and Time 2. In examining gender differences at Time 1, girls' anxiety had a mean of 4.09 ( $SD=1.19$ ;  $N=204$ ) and boys' had a mean of 3.82 ( $SD=1.36$ ;  $N=189$ ). An analysis of variance between girls and boys revealed a significant difference between the two groups ( $p<.04$ ). At Time 2, girls' anxiety ratings had a mean of 3.97 ( $SD=1.28$ ;  $N=186$ ) and boys' ratings had a mean of 3.71 ( $SD=1.32$ ;  $N=171$ ). The analysis of variance between genders was not significant.

Other child measures. Children were asked about the general quality of their relationship with their parents recently. These questions were asked about mothers and fathers separately. The items in this scale were designed to measure how warmly the child feels towards that parent and the quality of the relationship most recently.

Children were also asked how upset or disappointed their parents are when they do not do well in school. High scores on this scale indicate that children perceive their parents put a lot of pressure on them to succeed in school. Low scores on this scale suggests that these children perceive their parents put little pressure on them.

#### Parent measures

At Time 1, parents were asked to rate how true various personality traits were of them. After factor analysis of these items, a measure of general parent anxiety emerged.

Parents rated how much they thought they could do to influence their child's behavior and interests in various areas of their life. Bandura (1991)

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suggests that efficacy is best defined in terms of how influential an individual feels he/she is. Parenting self-efficacy, then, can be operationalized in terms of how capable parents feel they are in influencing their children's behavior. High scores on this measure indicate that parents feel efficacious as parents.

Parents also responded to two questions designed to assess how much they allowed their child to take part in family decisions. Low scores on this measure indicate a more authoritarian decision-making parenting style, whereas high scores reflect a more democratic decision-making style.

Additionally, parents were asked a series of questions about their family beliefs and expectations. A factor analysis of these beliefs revealed several factors, two of which are relevant to this study. The first factor tapped parents' beliefs about the family's cohesiveness, how well organized they felt they were as a family unit, and the warmth the parent felt towards their child. The second factor tapped how much competitiveness the family encouraged among its members.

## Results

The first set of analyses conducted in this study assessed the relations among the variables and tested the mediating and moderating hypotheses laid out in the introduction. First, zero-order correlation results are presented and then the results from the regression and path analyses are presented. Following the guidelines for testing mediating effects outlined by Baron and Kenny (1986), I first looked at zero-order correlations and then evaluated whether this pattern of relations changed when mediators were included in the regression analyses. Next, I used path analyses to assess the unique predictive association of the predictor variables with the outcome variable.

Finally, I introduced interaction terms into the path analyses to assess the moderation hypotheses.

#### Zero order correlational results

##### Mother/father correlational results

Initial correlational analyses among the variables outlined above for boys and girls combined are presented in Table 2 for mothers and fathers. In terms of child anxiety, as predicted, Child anxiety at Time 1 is highly correlated with Child anxiety at Time 2.

For mothers, Child anxiety at Time 2 is significantly related to the child's perception that their mothers put pressure on them to succeed academically. For fathers, child anxiety at Time 2 is also significantly related to the child's perception that their fathers put pressure on them to succeed academically. It is also significantly positively related to fathers' reports that the family is competitive and negatively related to fathers' reports that the family is cohesive and supportive. High child anxiety at Time 2 is also positively related to fathers' reports of high anxiety.

##### Boy/girl correlational results

Correlations were also calculated for boys and girls separately for the mother and father data (see Table 3 for mother data on girls and boys and Table 4 for father data on girls and boys). The following correlations are noteworthy.

For mothers, their daughters' academic anxiety ratings at Time 2 were significantly related to their mothers' own anxiety ratings. Similar to the results of Adams and Sarason (1963), these findings indicate that girls' anxiety may be more strongly related to their mother's anxiety than is boys' anxiety. Boys' academic anxiety ratings at Time 2 were negatively related to teachers' ratings of their academic ability. Boys' anxiety ratings were also positively

related to their perceptions that their mothers place pressure on them to succeed.

For fathers, their daughters' academic anxiety ratings at Time 2 were not significantly related to any of the parent or child predictors. For their sons, boys' academic anxiety was related to their perceptions that their fathers place pressure on them to succeed academically.

To assess whether two correlations from an independent sample are significantly different from each other, the following equation is often used:

$$z = \frac{r_1 - r_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}$$

Since sample sizes were about even for boys and girls ( $N=70$ ), in order for correlations to be significantly different from one another at  $p < .05$ , they must have a difference score of about .34 (Note that one of the correlations must also have a significant zero-order correlation). In examining the correlation matrices for mothers and fathers, there were six pairs of boy/girl correlations that were significantly different from each other for the mothers and none for the fathers. Consequently, a decision was made that path analyses for boys and girls would only be run on the mothers' data and not the fathers'.

#### Path analyses

##### Mother/father path analyses

Figure 1 presents the path analyses for the mothers and fathers. These path analyses were run separately for mothers and fathers, but are combined in one model for ease of comparison. At the first step of the analyses, child perceptions of Warmth towards the parent and Academic pressure to succeed were regressed separately on the five parent variables. Academic anxiety at Time 1 and Teacher rating of ability in math and reading were entered into the regressions first in order to control for their effects.

Warmth towards the mother was associated with Family cohesiveness and warmth towards the child. Also, mothers who reported feeling influential in their children's lives had children who felt less warm towards them than mothers who reported feeling less influential. Warmth towards the father was predicted by their reports of how much they allow their children to participate in decisions that concern them: Fathers who endorsed more democratic decision-making parenting styles had children who felt closer to them than fathers who endorsed more authoritarian styles.

Academic pressure to succeed was not related to any of the parent variables for mothers or fathers. This finding is surprising in light of the fact that it was related to several parent variables at the zero-order level (see Table 2).

In the next step in the path analyses, the outcome variable, Child academic anxiety at Time 2 was regressed on all seven predictors, entering the two control variables first, then the parent variables, and then the child perception variables. As Figure 1 illustrates, there was no relation between any of the parent or child variables and the outcome. It is important to note that the zero-order relation of Academic pressure to succeed and Academic anxiety at Time 2 for mothers and fathers was reduced to nonsignificance when other factors such as Warmth towards the parent were controlled. Academic anxiety at Time 1 was related to Academic anxiety at Time 2, as expected.

#### Mother-boy/girl path analyses

Figure 2 presents the path analyses for the mothers only for boys and girls. These path analyses were run separately for girls and boys, but are combined in one model for ease of comparison. In order to maintain a subject-predictor ration of 10:1, it was decided that Parent anxiety and Family

competitiveness would be dropped in these analyses. The path analyses for mothers combined suggested that these two parent variables were not significantly related to any of the child variables.

For girls, mothers' reports of Family cohesiveness was moderately related to their daughters' warmth towards them. For boys, Warmth towards the mother was negatively related to their mothers' decision-making style such that mothers who were more authoritarian had sons who felt warmer towards them. Academic pressure to succeed was predicted by mothers' decision-making style for girls only. Mothers who reported being more authoritarian in their decision-making had daughters who reported feeling pressure from their mothers to succeed academically.

Academic anxiety at Time 2 was not mediated by either of the child variables. However, several direct relations emerged. For boys, Academic anxiety at Time 2 was related to amount of parental influence. Mothers who reported feeling influential in their sons' lives had sons who reported low anxiety. Also, boys whose mothers reported that the family was highly cohesive and supportive had sons who reported high anxiety. For girls, Academic anxiety at Time 2 was significantly related to their perceptions that their mothers put pressure on them to succeed academically. Also of note is the fact that Teacher ratings of ability in math and reading was related to Academic anxiety for boys but not for girls. Boys whose teachers rated them low in ability reported feeling more anxious than boys whose teachers rated them high in ability.

#### Moderated effects

##### Mother/father moderated effects

In order to examine whether moderating effects were also present, path analyses for the mothers and fathers were run again, this time including the

interaction terms (see Baron & Kenny, 1986 for suggested methods of analysis). Before computing the 21 interaction terms, all parent and child variables were centered at the population mean by subtracting the population mean of each variable from the individual score to avoid problems of multicollinearity (see Jaccard, Turrisi, & Wan, 1990, for a discussion of these procedures). Then, the interaction terms were computed by multiplying each centered variable by each other. These interaction terms, along with the seven predictors and two control variables were entered into new regression equations for mothers and fathers. Interaction terms were considered significant only if they significantly increased the amount of variance explained using the F-test described by Jaccard et al., (1990). The level of significance was set at  $p < .10$ .

Using these criterion, only one significant interaction effect was found for mothers. Children's perceptions of their mothers as pressuring them to succeed moderated the relation of perceptions of their mothers' warmth towards them to their reports of academic anxiety. At low levels of perceived pressure, increased levels of perceived warmth had no relation to how much anxiety they reported feeling. However, as the level of perceived pressure increased, the positive association between perceived warmth and anxiety went up. Children who reported the highest level of pressure to succeed and who felt the closest and warmest towards their mothers also reported feeling the most anxious ( $B = .18, p < .05$ ;  $B = -.08, ns$ ;  $B = .09, p < .05$  for academic pressure to succeed, warmth towards mother, and pressure to succeed  $\times$  warmth respectively).

For fathers, several significant moderated effects were found: parent anxiety  $\times$  family cohesiveness ( $B = -.17, p < .10$ ), parent anxiety  $\times$  child perceptions of academic pressure to succeed ( $B = .21, p < .10$ ), parent influence  $\times$



family competitiveness ( $B=.24, p<.10$ ), warmth towards father x family competitiveness ( $B=.28, p<.05$ ), and decision-making parenting style x family competitiveness ( $B=.54, p<.01$ ). Figures 3-5 illustrate the three most significant interactions, all involving family competitiveness. To plot the interaction terms using the regression equations, the following hypothetical values, representing low (value=1), moderate (value=4), and high (value=7) responses on the 7-point scales, were used. The resulting equations are presented below:

$$\begin{aligned}
 & B_1(1) + B_2(1) + B_1B_2(1)=\text{low/low group} \\
 & B_1(1) + B_2(4) + B_1B_2(4)=\text{low/moderate group} \\
 & B_1(1) + B_2(7) + B_1B_2(7)=\text{low/high group} \\
 & B_1(4) + B_2(1) + B_1B_2(4)=\text{moderate/low group} \\
 & B_1(4) + B_2(4) + B_1B_2(16)=\text{moderate/moderate group} \\
 & B_1(4) + B_2(7) + B_1B_2(28)=\text{moderate/high group} \\
 & B_1(7) + B_2(1) + B_1B_2(7)=\text{high/low group} \\
 & B_1(7) + B_2(4) + B_1B_2(28)=\text{high/moderate group} \\
 & B_1(7) + B_2(7) + B_1B_2(49)=\text{high/high group}
 \end{aligned}$$

Figure 3 illustrates the interaction of family competitiveness with parental influence. At low levels of family competitiveness, increasing levels of parental influence had little effect on predicting child anxiety level. However, at increasing levels of family competitiveness, the relation between parental influence and child anxiety increased. Fathers who reported the highest level of parental influence and the highest level of family competitiveness had children who reported the highest level of academic anxiety.

Figures 4 and 5 show similar patterns of relations for family competitiveness and warmth towards the father and decision-making style. At high levels of family competitiveness and warmth towards the father, children reported the highest anxiety level. Further, fathers who reported the

highest level of family competitiveness and described their decision-making parenting style as highly democratic had children who reported the highest level of academic anxiety.

#### Discussion

The goals of this study were 1) to examine the associations between parent's self-reported anxiety level, their parenting style, and family interaction style and changes in children's self-reported anxiety over a two-year period, 2) to test whether child perceptions of their parents' warmth towards them and their perceptions of their parents' pressure on them to succeed academically mediate and/or moderate the relation between the parenting variables and child anxiety, and 3) to investigate whether the development of child anxiety differs depending on child and parent gender.

In general, this study found few associations between parent's self reported anxiety level, their parenting style, and family interaction style and changes in children's anxiety over a two-year period. One explanation for this finding is the fact that child anxiety at Time 1 accounted for so much of the variance at Time 2. It may be that by 5th grade children's academic anxiety has already become part of their personality style. Therefore, very little change occurs between 5th and 6th grades, and, consequently, parents have very little impact on children's anxiety. Examining these same variables when children are younger and their personalities are more changeable may result in more significant relations between parent variables and child anxiety.

Child perceptions of their parents' warmth towards them and their parent's pressure on them to succeed neither acted as a mediator between the parent variables and child anxiety, nor predicted child anxiety directly. The fact that child perceptions of their parents' pressure on them to succeed

academically was not related to child anxiety is particularly interesting in light of the fact that it was significantly correlated to academic anxiety at the zero order level. Apparently, placing high pressure on a child to succeed in school is not detrimental when other factors such as warmth and more democratic styles of parenting are also present.

For fathers, several moderated relations significantly predicted child anxiety. It was predicted that at high levels of child perceptions of fathers' pressure on them to succeed academically, increasing levels of fathers' anxiety would be related to increasing amounts of child academic anxiety. This finding was marginally supported in this study. However, several moderated effects were significant in the opposite direction of that expected. For example, it was predicted that children's anxiety would be highest when family competitiveness was high and parents endorsed a more authoritarian decision-making parenting style, reported that they felt they had little influence over their children's lives, and did not have a close, warm relationship with their children. However, results of the interaction analyses suggest that, for fathers, the opposite relations are significant in predicting changes in child anxiety. For example, results showed that children whose fathers described their families as highly competitive and endorsed more democratic decision-making styles felt more anxious. This may be because these children are under pressure to make decisions in which they must meet the high expectations of their fathers. Further, children may feel most anxious when their fathers place pressure on them to be better than others and they feel very close with them. Children who feel close to their fathers may have more invested in fulfilling their fathers' expectations to be better than others (and consequently feel more anxious) than children who feel less close to their fathers.

The one significant interaction for mothers (academic pressure to succeed x warmth towards mother) may reflect this same pattern for highly anxious children. That is, children who perceive their mothers as placing a great deal of pressure on them to succeed report higher anxiety only at increasing levels of perceived warmth towards their mothers. Again, these children may feel more anxious because they are more invested in their relationship with their mothers and feel particularly compelled to meet her high expectations.

Results of the path analyses for boys and girls on the mothers' data suggest that some parenting variables, including level of parental influence, family cohesiveness and warmth, and child perceptions of mothers' pressure for them to succeed academically, significantly predicted changes in boys' level of academic anxiety. This was not true for girls. An explanation for this finding is that girls' academic anxiety may already be a somewhat more stable characteristic for girls than for boys at this age (see zero order correlations of academic anxiety from Time 1 to Time 2). Consequently, parenting style and expectations may have a stronger impact on boys than on girls at this age.

Future studies in this area need to examine some of these parent variables and their impact on children at a younger age. It may be that the effect parents have on the development of anxiety in their children occurs at a much younger age. Also, academic anxiety in children may be more sensitive to classroom and teacher effects, especially in the later elementary and high school year. Future research may also explore the impact of both parent expectations and parental warmth vis-a-vis teacher expectations and classroom climate. Can good parenting overcome the detrimental effects of a high pressure/poor classroom environment and vice versa?

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Table 1. Constructs and reliabilities

Child anxiety      alpha Time 1=.77  
alpha Time 2=.77

- How much do you worry about doing badly in math?
- How much do you worry about doing badly in reading?  
(1=a little, 3=some, 7=a lot)
- How nervous are you when taking a test?  
(1=a little, 3=some, 7=a lot)
- Does your heart beat faster when you have to take a test?  
(1=not at all faster, 7=a lot faster)

Parent anxiety, general      alpha=.68 mothers, .71 fathers

- How often do you feel this way:  
(1=Never, 7=Almost every day)
- Have trouble getting to sleep or staying asleep
- Feel bothered by having an upset stomach
- Feel myself anxious and worrying about something I am nervous
- Being a parent makes me tense and anxious. (reverse coded)  
(1=Strongly disagree, 7=Strongly agree)

Parental influence scale      alpha =.88 mothers, .89 fathers

- How much can you do to influence your child's behavior and interests in the following areas:  
(1=Very little, 7=A great deal)
- get child to stay out of trouble in school
- help child get good grades
- prevent child from getting in with the wrong crowd
- get child to associate with friends who are good for him/her
- prevent child from doing things you do not want him/her to do outside of the home
- increase child's interest in school
- get child to resist the pressure from friends to do things you disapprove of

Decision-making parenting style scale      alpha=.85 mothers, .89 fathers

- How often does this child take part in making family decisions that concern him/her
- How often do you think this child should take part in making family decisions that concern him/her  
(1=Almost never, 7=All of the time)

Family cohesiveness/warmth towards child alpha=.75 mothers, .79 fathers

Indicate how typical each of the following characteristics is of your family (1=Never, 7=Almost all the time)

Family members help and support each other.

Our family enjoys talking and doing things together.

Household responsibilities and family schedules are well organized.

We live in an orderly place.

Indicate the extent to which each statement is true for you and your child: (1=Not at all true, 7=Very true)

I find it interesting and educational to be with this child for long periods of time.

I am physically affectionate with this child.

I am emotionally very close to this child.

Family competitiveness alpha=.69 mothers, .62 fathers

Indicate the extent to which each of these statements is true for you and the family members living in this household:

(1=Not at all true, 7=Very true)

I think a child should be encouraged to do things better than others.

I feel that it is good for a child to play competitive games.

Family members are compared with others as to how well they are doing at work or school.

Family members enjoy beating each other at sports or games.

Family members criticize each other openly.

Child perceptions of parental warmth alpha=.81 on mother items, .83 on father items

How often in the past month did your mom/dad:

(1=Almost never, 7=Every day)

listen carefully to your point of view

let you know s/he really cares about you

help you do something that was important to you.

Child perceptions of parental academic pressure to succeed

alpha=.72 on mother items, .73 on father items

How true are each of these statements about you and your parents:

(1=Not at all true, 7=Very true)

My parents punish me for not doing well in school.

My parents tell me how sad or disappointed they are when I don't do my schoolwork.



My mom/dad gets upset with me when I don't do well at school.  
No matter how well I do at school, my mom/dad doesn't think it is  
good enough.

How pleased do you think your parents are with how well you did in  
school this year.  
(1=Not at all pleased, 7=Very pleased)

Table 2. Correlation matrix of all academic anxiety variables - mothers and fathers

	Controlling variables			Parent predictors						Child mediating variables		Outcome
	1	2	3	4	5	6	7	8	9	10		
1. Child anxiety Time 1	--	.06	.03	.06	-.05	.05	.17*	.10	.17*	.56**		
2. Teacher rating of child's ability	-.02	--	-.03	.004	-.05	.15*	.06	-.01	.03	-.13		
3. Parental anxiety	.18*	.13	--	-.02	-.13*	-.02	.09	.09	-.06	.08		
4. Parental influence	.07	.07	.07	--	.008	.37**	-.06	-.02	-.11	-.03		
5. Decision-making parenting style	.05	.11	.13	.37**	--	-.02	.02	.13	.06	-.10		
6. Family cohesiveness/warmth towards child	-.20*	.18*	-.31**	.26**	.14	--	-.19**	-.03	.09	.08		
7. Family competitiveness	.25**	.26**	.15	.03	-.04	.005	--	.16*	-.01	.03		
8. Child perceptions of academic pressure to succeed	.17*	.01	-.08	-.22*	-.17*	-.20*	.04	--	-.30**	.19**		
9. Warmth towards parent	.10	-.001	.06	.06	.24**	.10	.07	-.23**	--	.04		
10. Child anxiety Time 2	.50**	-.06	.02	-.003	-.11	-.08	.13	.24**	-.02	--		

Note: Moms on top; Dads below. \* p < .05 \*\* p < .01

Table 3. Correlation matrix of all academic anxiety variables - mothers only, boys and girls

	Controlling variables			Parent predictors					Child mediating variables		Outcome
	1	2	3	4	5	6	7	8	9	10	
1. Child anxiety Time 1	--	-.03	.11	.24*	.02	-.10	.31	.008	.05	.62**	
2. Teacher rating of child's ability	.10	--	-.04	.09	.02	.15	.09	.10	-.14	-.11	
3. Parental anxiety	-.04	-.07	--	-.02	-.08	-.09	.15	.16	-.12	.25*	
4. Parental influence	-.10	-.09	-.03	--	-.05	.30**	-.11	-.09	.01	.08	
5. Decision-making parenting style	-.11	-.08	-.16	.06	--	-.02	.10	-.24*	.05	-.05	
6. Family cohesiveness/warmth towards child	.17	.12	.02	.42**	-.02	--	-.45***	-.13	.19*	-.04	
7. Family competitiveness	.05	.04	.04	-.02	-.11	.01	--	.15	-.19	.17	
8. Child perceptions of academic pressure to succeed	.20*	-.07	.06	.06	.04	.09	.18	--	-.49**	.07	
9. Warmth towards mother	.31**	.13	.02	-.24*	.04	.03	.17	-.12	--	.08	
10. Child anxiety Time 2	.52**	-.20*	-.05	-.15	-.13	.16	-.09	.33**	.03	--	

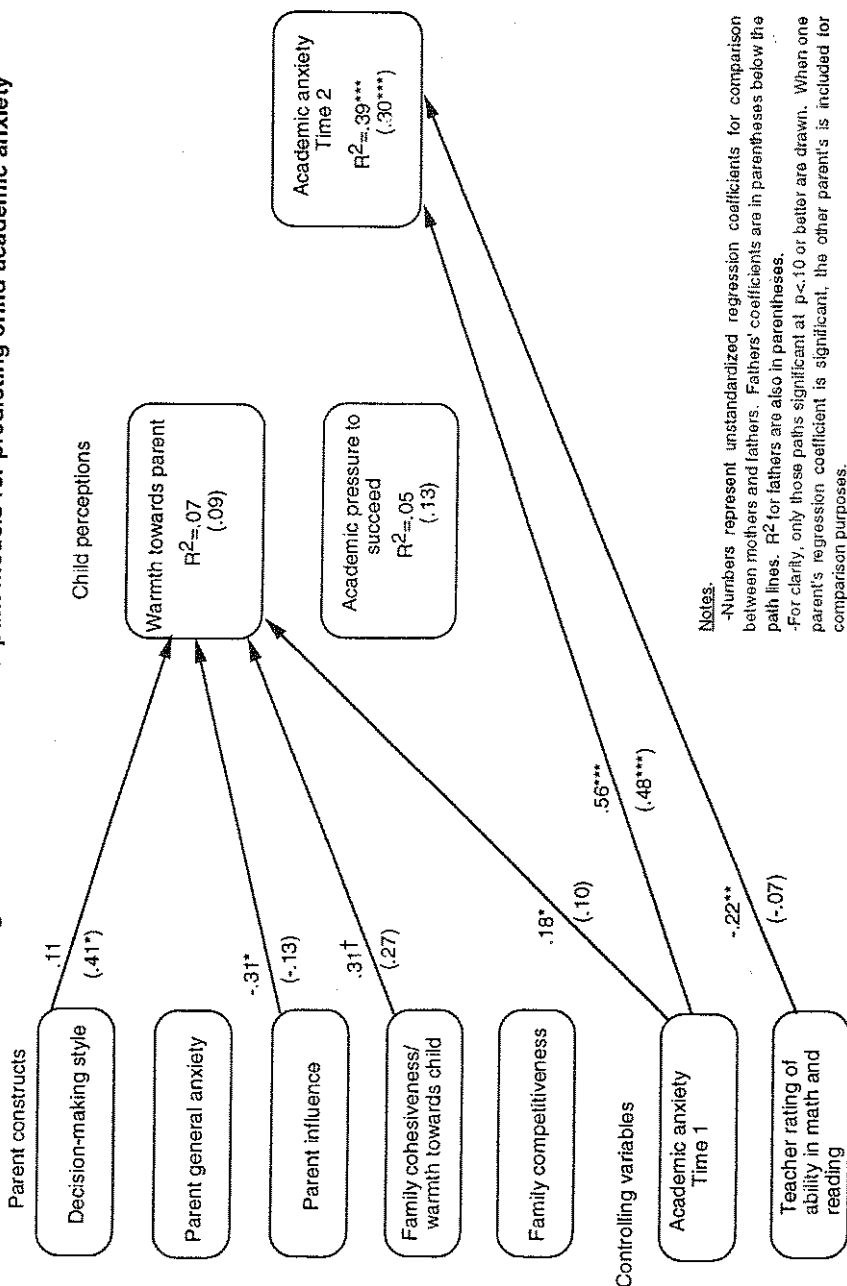
Note: Girls on top; boys below. \* p < .05 \*\* p < .01

Table 4. Correlation matrix of all academic anxiety variables - fathers only, boys and girls

	Controlling variables			Parent predictors						Child mediating variables		Outcome
	1	2	3	4	5	6	7	8	9	10		
1. Child anxiety Time 1	--	.14	.23	-.22	.07	-.24	.28*	.25	-.16	.56***		
2. Teacher rating of child's ability	-.09	--	.09	.26	.15	.26	.34*	.14	.04	.05		
3. Parental anxiety	.14	.18	--	-.10	.02	-.27	.05	.07	-.07	-.04		
4. Parental influence	.28*	-.07	.20	--	.26	.28	.01	-.16	.02	-.15		
5. Decision-making parenting style	.04	.01	.21	.45***	--	.27	-.08	-.11	.35*	-.01		
6. Family cohesiveness/warmth towards child	-.18	.13	-.35**	.25	.04	--	.05	-.12	.22	-.06		
7. Family competitiveness	.23	.23	.25	.05	.00	-.01	--	.12	.03	.28		
8. Child perceptions of academic pressure to succeed	.12	-.09	-.21	-.26	-.23	-.24	-.05	--	-.19	.19		
9. Warmth towards father	.29*	-.10	.17	.10	.16	.03	.10	-.27*	--	.01		
10. Child anxiety Time 2	.45**	-.18	.04	.10	-.20	-.13	.04	.33*	-.04	--		

Note. Girls on top; boys below. \* p < .05 \*\* p < .01

Figure 1. Mothers'/fathers' path models for predicting child academic anxiety

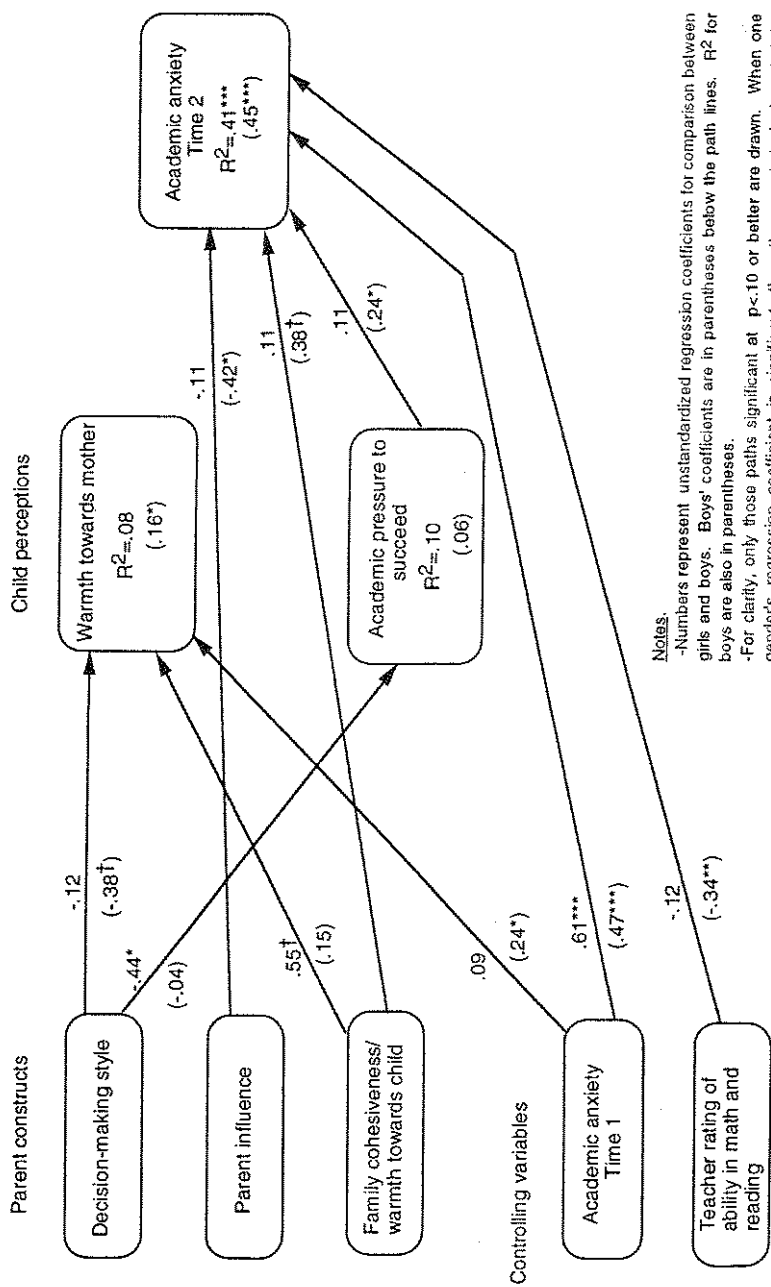


Notes.

-Numbers represent unstandardized regression coefficients for comparison between mothers and fathers. Fathers' coefficients are in parentheses below the path lines.  $R^2$  for fathers are also in parentheses.

-For clarity, only those paths significant at  $p < .10$  or better are drawn. When one parent's regression coefficient is significant, the other parent's is included for comparison purposes.

$^\dagger p < .10$   $^* p < .05$   $^{**} p < .01$   $^{***} p < .001$



**Notes.**

-Numbers represent unstandardized regression coefficients for comparison between girls and boys. Boys' coefficients are in parentheses below the path lines. R<sup>2</sup> for boys are also in parentheses.

-For clarity, only those paths significant at  $p < .10$  or better are drawn. When one gender's regression coefficient is significant, the other gender's is included for comparison purposes.

† $p < .10$  \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Figure 3. Interaction of family competitiveness and fathers' level of influence -  
Fathers

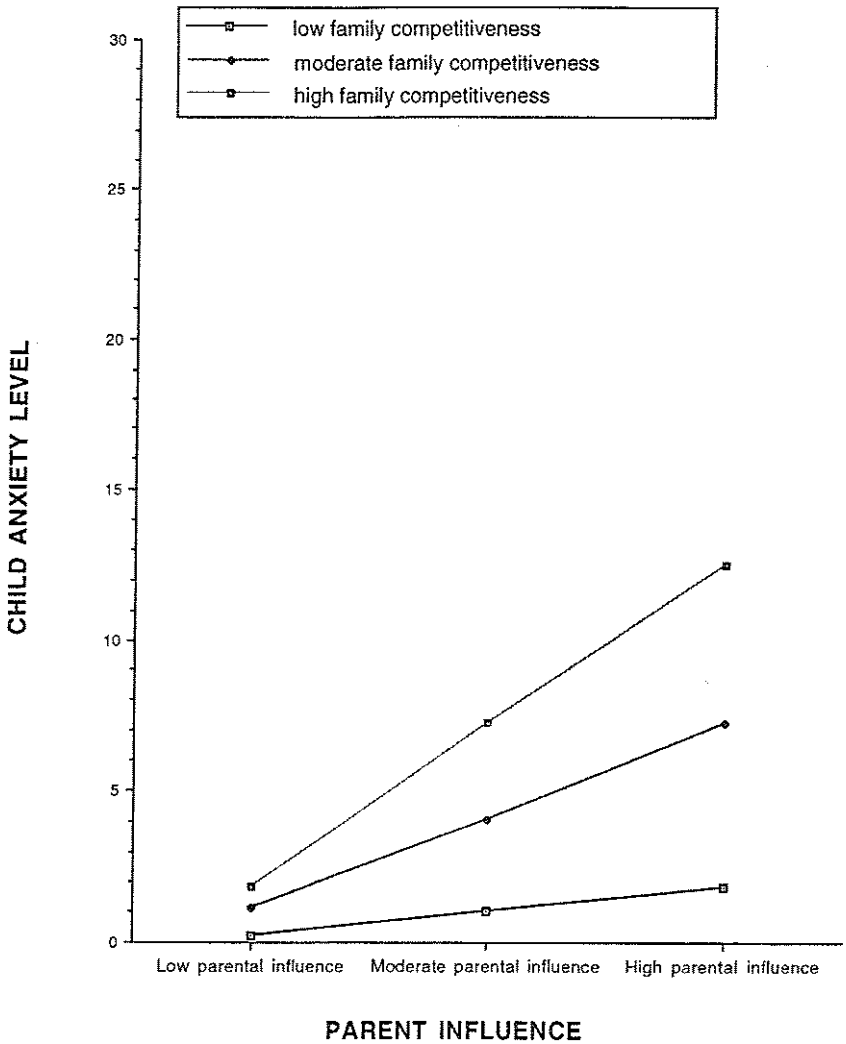


Figure 4. Interaction of family competitiveness and child's warmth towards father -  
Fathers

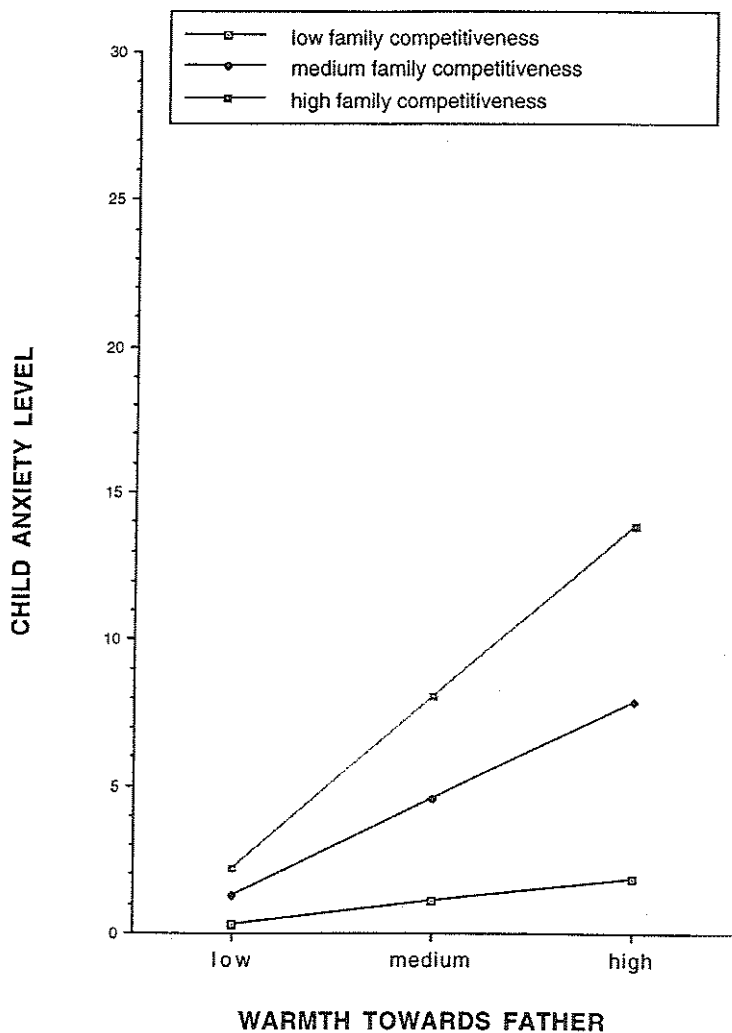




Figure 5. Interaction of family competitiveness and decision-making parenting style - Fathers

