Attributional Processes as Mediators of Sex Differences in Achievement

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There has been sufficient discussion in the attributional literature to suggest the possibility that sex differences in causal attributional patterns may be important mediators of sex differences in persistence in achievement in general and in mathematics education in particular. In assessing this possibility, three issues need to be addressed: First, both the exact nature of the sex differences in attributional patterns for school achievement and the consistency of these differences need to be specified; second, the causal significance of these differences for explaining math achievement needs to be assessed; finally, the interpretations commonly given to these differences need to be evaluated.

Sex Differences in Attributional Patterns

Recent reviews of the attributional literature have concluded that females and males differ in their attributional patterns in systematic ways, and that these differences have an adverse effect on girls' classroom performance (Bar-Tal, 1978; Deaux, 1976; Frieze, Parsons, Johnson, Ruble, & Fellman, 1978; Ickes & Layden, 1977). A careful review of the most commonly cited studies and of the most recent studies focusing on the attributional patterns of school-age children has led me to question the validity of these conclusions. Based on the conclusions of the various reviews, the effects reported are neither as consistent nor as strong as might be expected.

Typically, the reviews reach two conclusions: one regarding sex differences for failure attributions and one regarding sex differences for success attributions. With regard to failure, it is concluded that males tend to attribute failure to external or unstable causes, while females tend to attribute failures to internal causes. To assess the accuracy of this conclusion, I compared boys' and girls' attributions of their failures to lack of ability, to lack of effort, to internal causes, and to external
Behavior. The general significance of the difference in mediating achievement outcome attribution to the other possible attributions and (c) the mediating role of the sex difference in attributions to the effect of sex differences. The results of this study are consistent with previous research that has found that sex differences in achievement are less pronounced across different cultures. The results of this study are also consistent with previous research that has found that sex differences in achievement are less pronounced across different cultures.

Psychological and causal significance. The pattern of results for attributions to achievement to both the belief of effort, which is characterized by higher expectations for achievement among boys, and the belief of effort, which is characterized by higher expectations for achievement among girls, is consistent with previous research that has found that sex differences in achievement are less pronounced across different cultures.

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other studies (Parsons, Adler, Kaczala, & Meece, in press) it has been found to account for only 3% to 5% of the variance. Similarly, in studies using the IAR the sexes typically differed by no more than 1 to 1.5 items (Crandall et al., 1965; Dweck & Reppucci, 1973), and the direction of the difference varied across the studies.

Ability is also not rated as one of the most important determinants of success by either sex. For example, it has been found that girls rate lack of ability as the fifth, while boys rated it the sixth, most important cause of math failure out of a possible list of eight causes. Dornbusch (1974), Dweck and Bush (1976), Parsons, Adler, Futterman, et al., (in press), and Parsons, Adler, Kaczala, and Meece, (in press) all found lack of effort to be the most preferred attribution for both boys and girls; Parsons, Adler, Kaczala, & Meece (in press) found task difficulty to be the second most important reason given for math failure by both boys and girls. Even in studies in which lack of ability was rated as fairly important (Dweck & Reppucci, 1973; Dweck & Bush, 1976; and Fennema, in press), its importance rarely exceeded the importance attached to lack of effort by either boys or girls.

Finally, one has to question the causal significance of the obtained sex difference. Both Fennema (in press) and Parsons (1980) have argued that the sex difference in the use of the ability attribution is not very important in predicting long-term persistence in mathematics. Parsons (1980) found that attributions add only about 1% to 2% to the amount of variance in persistence that can be accounted for using a battery of measures that include perceived task value, confidence in one’s mathematical ability, and perception of task difficulty. A recent study by Covington and Omelich (1979) provides additional support for this conclusion. Using the results of a path analysis, they argue that attributions have little causal significance for ongoing classroom achievement behaviors. Thus it is reasonable to question models based on attributional differences proposing to explain sex differences in academic achievement behavior until more evidence is available to establish the causal importance of attributions for school achievement.

Values, Attributions, and Learned Helplessness

Before setting aside the issue of the psychological significance of attributions, comment on the value judgments being made in the research literature regarding the significance of the sex difference in attributional patterns is warranted. One particular concept that warrants discussion is one that has grown out of the attributional research, namely, learned helplessness. Learned helplessness is currently being used to help explain sex-related differences in achievement strivings. The assumption that girls are more likely to exhibit learned helplessness in an academic setting than are boys has recently been extended to explain achievement differences in mathematics (Dweck & Licht, 1980). Given the importance that is being attributed to the construct of academic learned helplessness, a careful evaluation of its role in explaining sex difference in achievement is called for. Academic learned helplessness is operationally defined in a variety of ways. The four most common definitions are (1) the propensity to attribute failure to a stable, internal cause, that is, ability; (2) infrequent attribution of either success or failure to effort; (3) high frequency of a debilitating behavioral response to failure; and (4) teacher nomination.

As discussed earlier, there are fairly consistent sex differences in children’s propensity to attribute failure to lack of ability; girls appear to be more likely to attribute their failures to lack of ability than are boys. So, according to the finest definition of learned helplessness, we might be willing to conclude that girls are more likely to exhibit learned helplessness behavior than are boys. However, both girls and boys are more likely to attribute their failures to lack of effort than to lack of ability, and the sex difference in children’s rating of importance of lack of ability in explaining their failures is generally quite small.

The evidence for a sex difference in learned helpless behaviors as delineated in the last three operational definitions is even less definitive. With regard to attributing one’s successes and failures to effort, the sex differences are inconsistent and just as likely to go counter to the predicted direction as to support it. The one study that used this criterion to classify children as learned helpless or mastery oriented (Diener & Dweck, 1978) did not report finding any sex difference on either the attributional measures or the percentage of children judged to be learned helpless. Using children’s behavioral response to failure as the criterion measure also lends little support to the notion that girls are more likely to exhibit learned helpless behavior than are boys. While the nature of girls’ responses to failure are affected by the sex and age of the evaluator (Dweck & Bush, 1976), girls’ behavioral responses in terms of persistence and accuracy following failures are, by and large, equivalent to those of boys (Beck, 1977-1978; Dweck & Reppucci, 1973; Dweck, 1975; Dweck & Gilliard, 1975; Diener & Dweck, 1978; Dweck & Bush, 1976; Nicholls, 1975; Parsons, 1978, 1980; Parsons, Adler, Kaczala, & Meece, in press; Rhodes, Blackwell, Jordan, & Walters, 1980).

This is not to say that boys and girls do not differ in their responses to achievement feedback. There is some evidence, though it is not entirely
The results of our study indicate that the more exposure children have to mathematics, the higher their performance is likely to be. This is consistent with the findings of previous research (e.g., Resnick, 1989). However, the extent to which this exposure is effective depends on the quality of the instruction and the engagement of the students. In our study, we found that children who received instruction that was more interactive and that encouraged them to apply mathematical concepts in real-world situations performed better than those who received traditional, less interactive instruction. This suggests that a more active, student-centered approach to teaching mathematics may be more effective in improving children's performance in the subject.

Conclusion

In conclusion, our study supports the idea that exposure to mathematics is crucial for children's performance in the subject. However, the quality of the instruction is also critical for the effectiveness of this exposure. Teachers need to be trained to provide more interactive and engaging instruction that encourages students to apply mathematical concepts in real-world situations. This will not only improve children's performance in mathematics but also increase their interest in the subject.
amount of effort necessary to continue performing well is just not worthwhile. For some students either of these beliefs would be sufficient justification for a decision not to enroll in advanced math courses. The same limits would apply to the boy who views his ability rather than his efforts as the relatively more important determinant of his success in math. His abilities should allow him to continue performing well with little or no additional expenditure of effort. In support of this hypothesis, girls do have lower future expectancies and see future math courses as more difficult than do boys (Parsons, Adler, Futterman, et al., in press), but do not have lower expectancies for success either on their current math courses or in the experimental mathematical tasks.

REFERENCES


