Critical Review of Scholarly Article #2

Sex Differences in Math Performance:

The Role of Children's Approach to Schoolwork

In this article a Comparing Intact Groups research design was used to investigate to what extent girls' and boys' approach to schoolwork accounts for girls getting better math grades in school than do boys. The student's characteristics are present at the beginning of the study. A population of fifth-graders was studied, using the entire grade in three separate schools that were relatively homogenous and using an opt-out consent to avoid a selection bias. Based upon this, we can make a statement about significant differences among groups, but we cannot make cause and effect conclusions.

The dependant variable in this case was the sex of the student and the independent variables were the math grades, achievement test scores, achievement goals survey, disruptive behavior survey, learning strategies survey and a self-efficacy survey.

Dependent variable is the outcome of interests that the researcher observes and measures. We assume that the grades depend upon the learning approach. The independent variables are not directly the gender, but the learning styles that are more highly present in the girls that account for the better grades. These include the relative strength of mastery over performance goals and the restraint from disruptive behavior in the classroom. They also measured other factors to more fully analyze the data. These included the test scores and assessments of self-efficacy. Some of these measures were found to be non-gender based, but still have effects on grades and test scores.

The null hypothesis for this study could be, girls approach to schoolwork does not facilitate them to do better at math in school than do boys or differences in approaches to schoolwork between girls and boys do not account for girls getting better grades in math than boys. If the null hypothesis is rejected, then some alternative is felt to be the cause of the grade difference. The authors suggest that it could be teacher attitudes about behavior in the classroom in the introduction.

The alternative hypothesis could be, girls approach to schoolwork does facilitate them to do better at math in school than do boys or gender-based differences in approaches to schoolwork account for girls getting better grades than boys in math.

The overall findings of the study were actually rather complex because so many variables were included. Math grade differences between boys and girls increased over time because girls' grades increased while boys' grades did not change. Girls were found to have greater mastery goals, more effortful learning strategies, and less disruptive behavior, all behaviors that were also associated with better grades, which continued over time. Grades and test scores were not predictive of the

learning styles. Disruptive behavior predicted lower grades. Test scores (but not grades), however, did surprisingly predict disruptive behavior. (My interpretation is that high scorers who do not have to try hard to achieve become bored and are more likely disruptive) Self-efficacy, a measure that did not find a gender difference, was also associated with better grades and achievement scores initially and over time. It did not predict grades over time once initial grade were taken into account, but did predict better test scores even after initial test scores were taken into account. Self-efficacy was highly predicted by both good grades and test scores, which is to be expected. There was high stability of these factors over time, and they were felt to have been present prior to the study and therefore predicted the baseline grades and test scores as well. Therefore, the effect size was small. They concluded that the null hypothesis was accepted and that learning strategies and approaches to schoolwork partially underlie the sex difference in math grades. It leaves open that other factors also contribute.

Q) Discuss at least two significant findings based upon the observed F-values found in the article. Use the p-values to help you determine the significance of the observed F value (effects of two independent variables on the dependent variable).

PG16 –F values of performance in math submitted to a Sex X Grade X Performance analysed found Boys behavior worsened over time and girls' advantage over boys in terms of their grades intensified over time was highly significant with a p value in the study of .001. This was in line with predictions and added validity to the study.

Regression analysis was used in the study to show fit consistent with prior analysis of sex predicting both achievement goals and disruptive behavior. This showed that girls had high mastery-focused achievement goals and low disruptive behavior that predicted better grades over time. Regression was also used to suggest that in time the same processes involved in children's classroom performance could be generalized to achievement test performance. However, the role of these processes may be superseded to some degree by self-efficacy.

Q) Discuss two ways the study could be improved, in research terms, specifically.

I found this to be a very well written and thorough study. It did a very good job validating critical issues while leaving the door open for further research. With this in mind the study could be improved by including a detailed correlation analysis of self-efficacy surveys and IQ scores of students in a Pearson correlation coefficient to be used to indicate the relationship between the two variables. This could be used to determine to what degree environment may play in goal achievement. Also, a survey distributed to teachers based on a Likert-scale regarding attitudes about to determine relevance of behavior in the classroom and effect on grades. The obtained data could analyzed using chi-square to evaluate goodness of fit.