



# Individual Presentation Proposal

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## *Predicting Mathematics Achievement in High School: The Role of Self-Regulatory Beliefs*

### Abstract

This study examined attribution beliefs, openness for problem solving (willingness to engage with and be open to challenges), homework (any task assigned by the teacher and carried out at non-instructional time), and self-efficacy as predictors of mathematic achievement with 1, 530-15-year olds. The data were extracted from the PISA2012.

Although, a number of studies have documented the relationship between attribution for failure beliefs (AF) and Mathematic self-efficacy (ME), to my knowledge no studies have explored how these variables along with openness for problem solving, OPS, (willingness to engage with and be open to challenges) and time-on homework, HW, (any task assigned by the teacher and carried out at non-instructional time) contribute to mathematics achievement (MA). The research questions guiding this study include (1) How much of the variance in student mathematics achievement is accounted for by attribution of failure beliefs, Openness to Problem solving, time-on homework, and math self-efficacy? And, (2) is there a difference by gender in these targeted variables?

The data comes from the US 2012 Program for International student Assessment (PISA) that allows a comparison of learning outcomes of high school students. The student sample was reduced to 1, 530 fifteen-year olds (48% males, 52% females) using the listwise deletion method.

Descriptive statistics revealed statistically significant correlations amongst all variables. A 3-step multiple regression analysis examined the relationships amongst the predictor variables attribution for failure, time-on homework, openness to problem solving, and mathematic self-efficacy to the criterion mathematic achievement. The overall model explained approximately 38% of the variance for mathematic achievement. Independent t-test revealed a difference by gender for each of the predictor factors. Males were more likely to report higher levels of attribution for failure, openness to problem solving, and mathematic self-efficacy; while females reported spending more time-on homework than males.

The results revealed important information for consideration in the development of intervention programs aimed at improving mathematic achievement. For example, when self-regulated learning strategies are present it explains achievement and decreases the negative impact of maladaptive attributional beliefs. Moreover, as expected, the final model in this study showed that mathematic efficacy explains a higher variance in math achievement, but it also showed that the SRL behaviors such as openness for problem solving and time-on homework continued to contribute significantly.

Future research into mathematics achievement should focus on the situated and contextual nature of attribution beliefs for facilitating or constraining academic achievement. For practitioners, this study reminds us that it is important to understand student beliefs, because student beliefs interact with aspects of motivation necessary for initiating self-regulatory learning.

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