HANDLING NEGATIVE EMOTIONS IN LEARNING MATHEMATICS

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This study is part of a project that aims to investigate students' coping with negative emotions when faced with difficulties in mathematics. Frydenberg and Lewis's (1993) adolescent coping model was adopted to explore coping and The Coping with Mathematics Scale was developed to evaluate students' strategies for coping when faced with difficulties in mathematics (Ader, 2004). The aim of the present study was to determine the prevalent coping strategies of 490 middle school students using the data based on The Coping with Mathematics Scale. The results indicated that students used coping strategies focusing on solving the problem most frequently and significant correlations between use of various coping strategies and math anxiety were found.

Keywords: coping, mathematics anxiety

The present study is part of an ongoing project that aims to investigate students' coping with math anxiety and negative emotions when faced with difficulties in mathematics. Mathematics anxiety has been defined as the feeling of pressure that limits the use of numbers and solving mathematical problems in academic settings and everyday life (Richardson & Suinn,1972). It has been shown to lead to emotional symptoms, such as panic, fear of failure, self doubt, frustration, hopelessness, shame, powerlessness as well as sweating, nausea, stomach disturbance, difficulty in breathing and inability to concentrate. Mathematics anxiety turns mathematics into a source of stress for many people (Bursal & Paznokas, 2006), frequently leading to detrimental cognitive consequences (Ashcraft & Ridley, 2005).

Mathematics anxiety being a source of stress for many students is thought to be overcome by some who can successfully cope with anxiety and negative emotions when faced with mathematical difficulties. The theoretical framework put forward by Frydenberg and Lewis's (1993) adolescent coping model was adopted to investigate this claim. It was assumed that as the prevalent coping strategies for math anxiety were unfolded, the obtained information could be utilized in math education to train math anxious students for more effective coping strategies (Frydenberg, 2004).

Initially, The Coping with Mathematics Scale was developed to evaluate students' strategies for coping with difficulties in mathematics (Ader, 2004). The scale was found to be an effective tool to determine students coping strategies to overcome mathematics anxiety. Initially, items were generated by adaptation of items from Frydenberg and Lewis' Adolescent Coping Scale for contexts of dealing with mathematics. The opening study for the development of the scale was conducted with 751 students preparing to take the university entrance examination in Turkey. The final form of the scale in the first study comprised 36 items in three sub categories:

13 items in *coping focused on solving the problem*, 13 items in *non-productive coping* and 10 items in *coping with reference to others* (Ader, 2004). In the second study for the revised short form of the scale, data were collected from 174 adolescents. The psychometric characteristics of the 18 item short form of the scale were reported (Ader& Erktin, 2012).

The aim of the present study which was the third study of the project was to determine the prevalent coping strategies of students when faced with math anxiety and difficulties in mathematics using the data based on The Coping with Mathematics Scale. 490 adolescents from year 6 to 8 of a public primary school (aged between 11 and 15) took part in the study. Math anxiety levels of 293 of the students were also obtained.

The results indicated that students used coping strategies focusing on solving the problem more frequently than non productive coping strategies and coping strategies with reference to others. Yet use of coping strategies focusing on solving the problem were significantly lower among 8^{th} graders in comparison with 6^{th} graders. When the relationship among use of coping strategies and levels of math anxiety were considered, a strong negative correlation between use of problem focused coping and math anxiety, and a positive correlation between use of non productive coping and math anxiety were found. Building on the findings of this study, a pressing need for further studying coping strategies and the links between anxiety and coping through various other approaches (e.g. longitudinal studies) is highlighted.

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