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PREDICTION OF TEST ANXIETY ON MATHEMATICS ACHIEVEMENT GOAL ORIENTATION AND SELF-CONCEPT

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ABSTRACT
This research was conducted to evaluate the relationship between mathematics self-concept and achievement goal orientation for predicting test anxiety of high school students. The sample size selected through multistage cluster sampling included 374 female students from First Zone of Tabriz high school. In order to obtain data, Test Anxiety Inventory (TAI), Goal orientation (AGQ) and mathematics self-concept (PISA), a questionnaire was used. Data were analyzed by Pearson correlation and step-wise regression. The results showed that there is a significant relationship between predictive variables (mathematics self-concept, mastery approach, approach performance, avoidance performance and avoidance mastery) and test anxiety in student. Stepwise regression analysis showed that, among the studied variables, mathematics self-concept and mastery approach might predict test anxiety in students.

Keywords: Test Anxiety, Mathematics Self-concept, Achievement Goal Orientation

INTRODUCTION
Anxiety is an undesirable emotional state which is associated with perturbation, dread, phobia and anxiety. A certain level of anxiety is considered as an appropriate and compatible response and is necessary to confront danger, plan, awareness and study, but lack of anxiety or too much anxiety faces one with considerable problems and dangers. In fact, anxiety is useful, constructive and even pleasant at average level and enforces one to do work; but, if anxiety goes beyond this level, it destroys talent and cause lack of concentration and memory impairment. Guida and Lullow (2007) define test anxiety as a type of unpleasant and emotional reaction to evaluation situation in school and class. This emotional condition is often associated with stress, anxiety, fear, confusion and irritation of autonomous neural network. In Calvo's point of view, (2008), test anxiety is one's concern about his performance (failure expectation), his talent and ability (for example assumptions about inferiority complex that appears at the time of test or assessment). Test anxiety is a process which is known by student's weak self-concept about his mental abilities and leads to reduction of their performance during last days before the exam. However, an acceptable amount of anxiety and fear during the exam can activate one's automatic neural system, and cause more conscious to make success in exam. The main reason for too much test anxiety is not always little work, laziness or lack of mastery over course book contents; rather, successful, motivated and studious students also sometimes suffer from the negative effects of test anxiety. According to theoretical model of Peantrich *et al.,* (1991), test anxiety is another aspect of motivational approaches. Test anxiety is a series of behavioral and physiologic phenomenological reactions which are associated with concerns about social negative consequences or failure in exam or similar evaluative condition. Studies show that people who have professional and performance-oriented goals, obviously report less anxiety than those ones whose purpose is to avoid performance. Professional and performance-oriented goals have negative relation with test anxiety and the goal of avoidance performance is positively related to test anxiety. Researches on the negative impact of test anxiety on the academic achievement are integrated and states that the more the test anxiety, the less academic achievement will be.

The variable whose relation with test anxiety is studied in the present research is the achievement goal orientation variable. For more than two decades motivation researchers have been concentrated on the role that goals play in formation of attitudes and severity and quality of behavior. In the motivation theory, goal is defined as the final goal that efforts should be directed and what one tries to do or a series

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of desirable things. During the two last decades, one of the primary structures in the study of motivation is achievement. The orientation of achievement goal is defined as reflector of student's reasons and objectives for being involved in performing tasks. Because of having educational background, achievement goals are appropriate environment for social interactions among students and are very favorable and encouraging for behaviors related to achievement in the academic domain.

The studies done by KhezriAzar *et al.,* (2010) among junior high school students of Mahabad showed that Self-efficacy has positive impact on the value of homework, mastery-oriented goals, Functionalism and mathematics achievement. However, avoidance performance negatively affects performance. Soviny *et al.,* (2012) research with a sample size of 579 subjects introduced four groups of pupils (indifference, avoidance-oriented, mastery-oriented and success-oriented).Indifferent and avoidance oriented students showed less adaptive patterns of academic motivation and well-being than mastery and success oriented students. Sideridis (2005), in analyzing the relationship between variables of goal orientation, academic achievement and depression concluded that goal orientation of functionalism is positively related to achievement, attempt and persistence and negatively related to anxiety and depression. The function avoidance goal is also related to low achievement and depression. In the studies by Elliot *et al.,* (2005), there was a negative relation between function- avoidance goals and academic achievement and a positive relation between functionalism goals and academic achievement.

Another variable under study is mathematics self-concept. In addition to cognitive aspect, non-cognitive aspects can also affect areas of student's mathematics learning. Among important cognitive factors in mathematics, reasoning and problem-solving performance and among its emotional aspects self-concept of students who enjoy learning, shows more interest and better performance in class. Mathematics self-concept (like, I really love mathematics) directly affect student's mathematics performance and internet motivation also affect mathematics performance through mediation. In fact, mathematics performance is determined by motivation but its share is more than mathematics self-concept.

Attention to the relationship between self-concept and achievement is derived from the fact that self-concept has motivational features, meaning that change in self-concept leads to change in next academic achievement. Mathematics self-concept depends on student's mathematics performance.

Academic self-concept refers to personal knowledge and individual perceptions about themselves in the academic achievement situations and refers to the fact that learners can successfully do an academic homework given at planned situations and levels. Academic self-concept of each individual is highly depended on social information and is a reflection of other's assessment. In other words, academic self-concept of each individual is obtained as a result of comparison with others. Results of Miller and Pagar's Path Analysis (1994) show that there is a relationship between function of problem solving and mathematics self-concept, as a result, mathematics anxiety also decreases. But this performance is highly correlated with self-efficacy and not mathematics self-concept. Also, mathematics self-concept reduces student's mathematics anxiety. According to the findings of the above research and the theoretical discussions mentioned, the main purpose of this research is to predict test anxiety based on mathematics self-concept, achievement goal orientation (Mastery-oriented, Functionalism, mastery avoidance and function avoidance) among high school students.

MATERIALS AND METHODS
The statistical population of this research is all high school students of first area of Tabriz city in school year of 2013-14 who are studying in the schools of the city. The number of statistical population of this research is 3150 people. According Morgan's table of sample population determination, 374 female students were chosen through multistage cluster sampling method.

Data collection tools in this research are questionnaires of anxiety test (TAI) composed of 25items and respondents answer it based on a 4 option scale (never=0, rarely=1, sometimes=2, often=3). In the present research the Cronbachalpha obtained equals to 90%, the Achievement Goal Questionnaire composed of 12 items, with four components including; mastery-orientation (items, 12, 8, 2), functionalism (items 1, 7 ,9), avoidance performance (items 11, 4, 6) and mastery avoidance (items 10, 5, 3). Items in 5 item Likert

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scale are scored from 1 (strongly disagree) to 5 (strongly agree). In the present study, Cronbach's alpha components were calculated as mastery-oriented (68%), Functionalism (58 %), the avoidance performance (64%), avoidance mastery (67%). And Program for International Student Assessment (PISA) that consists of 5 items and are answered in a quartet scale of Likert type (totally agree to totally disagree) and represents the level of student's perception about mathematics problems. In order to analyze the reliability of questionnaire structure, the correlation between mathematics self-concept and academic achievement is determined that equals to 88%. Also, the validity coefficient resulted from the re-test method equals to 67%.

Findings of the Study

Table 1 gives the mean and standard deviation of students in the study variables. The mean and standard deviation of test anxiety, is calculated (10/50M =, 26/15 SE =) respectively. These means refer to a high level of test anxiety in students. The mean and standard deviations for other variables in the study is represented in the table below (Table 1).

Table 1: Descriptive analysis of variables

Mean	Variable
59/10±15/26	Test anxiety
16/84±4/28	Mathematics self-concept
10/43±2/84	Mastery-orientation
3/18±1/33	Functionalism
14/85±5/29	Performance avoidance
13/25±1/46	Mastery avoidance

Table 2 indicates the correlation predicting variables and criterion variable, i.e. test anxiety. There is a significant correlation between these variables with criterion variable ($p<0.05$). The highest amount of correlation was between mathematics self-concept and the criterion variables (r= -0/432) and the lowest amount was in performance avoidance (r= 0.121). Regarding the variable of mastery-orientation (r= -0.425), functionalism (r=-0.3), and mastery orientation, r equals to -0.425, 0.3, and 0.137, respectively.

Table 2: Stepwise regression analysis of prediction variables based on test anxiety

Sig	R	Variables
0/0001	-0/432	Mathematics self-concept
0/0001	-0/425	Mastery-orientation
0/0001	-0/300	Functionalism
0/026	0/121	Performance avoidance
0/012	0/137	Mastery avoidance

In order to determine the role of test anxiety as criterion variable and predictive variables including mathematics self-concept, mastery-orientation, functionalism, mastery avoidance, and performance avoidance, step-wise regression analysis was implemented. Table 3 indicated the results.

Table 3: Step-wise regression analysis of predictive variables on test anxiety

P	F	SE	R^2	R	p	t	β	Variable	
0/0001	75/654	13/83	0/190	0/436	0/0001	-8/698	-0/436	Mathematics self-concept	Step 1
					0/0001	-6/713	-0/332	Mathematics self-concept	Step 2
0/0001	65/016	12/99	0/288	0/536	0/0001	6/652	0/329	Mastery-orientation	

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As it can be seen, the self-concept variable in the first step can predict 19% of the changes in criterion variable. By adding mastery-orientation variable to the self-concept variable of mathematics for self-adjustment in the second step, these two variables have been able to explain 29% of changes in educational procrastination. Results refer to the point that the functionalism, mastery avoidance and performance avoidance variables are not able to predict criterion variable and have been removed from the equation. In table (3) ß is shown as meaningful level and variance of each variable.

DISCUSSION AND CONCLUSION

This study tried to examine the relationship between mathematics self-concept, achievement goal orientation (mastery-orientation, functionalism, avoidance mastery, avoidance performance) in predicting the criterion variable of high school students. High mean of test anxiety in students indicates their stress during exam. Although one of the most important subjects in education curriculum is mathematics, most people state that they are not skillful in this area and are weak and somehow dread of it. Particularly, some of students really hate it and believe that mathematics is one of the most difficult courses and a small number of them perform well in mathematics. Some of them think if someone performs well in mathematics, he is genetically talented in mathematics which contradicts human efforts in learning mathematics. Weakness in learning mathematics is a common and widespread issue among people and among its probable reasons is weak educational system, psychological hurdles, wrong and fancy suppositions about the nature of mathematics.

Pearson correlation refers to the significant relationship ($P<0.05$) between criterion variables (mathematics self-concept, mastery orientation, functionalism, and avoidance performance and avoidance mastery) and test anxiety. These findings are consistent with Sideridis (2005), Elliot and Moller (2003), Ahmed *et al.,* (2012) and Ashuri (2011). In explaining these findings, we can state that self-conception variables is associated with reducing anxiety, stress and confusion and neural irritation (Ferla, Valcke & Cai) and achievement goal orientation with activities such as competence value, efficacy realization, self-efficacy and improved processing level (Elliot and Moller, 2003), and attempt to learn (mastery orientation), attempt to do works better (functionalism), avoiding weak performance towards others (avoidance performance) and avoidance of learning during work while test anxiety is conversely related to this process and contradicts them. The calculated correlations in this research are consistent with these points.

Furthermore, in order to determine the prediction ability of foresight variables, stepwise regression analysis was used. Mathematics self-concept variables and mastery-orientation of mathematics achievement goal levels had the ability to forecast criterion variable ($P=0.0001$). These findings are consistent with Sideridis (2005), Elliot and Moller (2003), Ahmed *et al.,* (2012) and Ashuri (2011). In explaining these results, we can refer to Pintrich *et al.,* model (1991) according to which test anxiety is considered as another aspect of motivation strategies. Test anxiety is a collection of physiological and behavioral phenomenological answers that is associated with concern about negative social consequences or failing an exam or similar evaluative condition. Studies show that people who have mastery and performance oriented goals clearly report less anxiety than those whose purpose is avoidance performance. Functionalist and mastery oriented purposes are negatively related with test anxiety and avoidance performance goal is positively related to test anxiety while people's self-concept is related to trust in performances and competencies or abilities and reduction in anxieties and stress and confusion and irritation of autonomous neural network. Also, according to motivation achievement theory, goal is defined as the final direction of efforts that should be guided and what people try to do or a series of things commanded and anxiety interferes as a basic barrier in achieving these goals. A high negative correlation among these two variables verifies this claim.

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