

Academic Expectations of Students in Turkey in TIMSS 2011

TIMSS 2011 Çalışmasına Katılan Türkiye'deki Öğrencilerin Akademik Beklentileri

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Abstract: The present study examined predictive effect of gender, home educational resources, family involvement, and motivational beliefs of self-efficacy and task value in science on students' academic expectancies. 6331 eight grade students who participated in TIMSS 2011 in Turkey consisted of the sample of the study. Logistic regression analyses results revealed that girls had higher levels of expectations to attain university education than boys. Home educational resources, family involvement, and self-efficacy in science emerged as significant and positive predictors of students' academic expectations, as well. Some suggestions were provided for science teachers to promote their students' self-efficacy beliefs and for parents to improve their involvement in schooling.

Key Words: academic expectation, gender, home educational resources, family involvement, self-efficacy

INTRODUCTION

Academic expectancy is individuals' expectations about highest level of education that they will attain (Bui, 2007; Liu, Cheng, Chen, & Wu, 2009). Academic expectancy is a form of expectation students have about their future educational achievement (Liu et al., 2009). Expectancy-value theory (Eccles & Wigfield, 2002; Wigfield, 1994) links students' expectations to students' achievement behaviors. Based on the theory, individuals' expectations for success influence their persistence, choice, and performance (Eccles & Wigfield, 2002; Wigfield, 1994). Thus, individuals who have higher academic expectations are expected to attain higher academic achievement in the long term (Liu et al., 2009). Previous studies revealed a positive correlation between academic expectancy and academic achievement (e.g., Bui, 2007; Liu et al., 2009; Mau, 1995). For instance, Bui (2007) found a positive relationship between educational expectations and academic achievement of middle school and high school American students. In a longitudinal study, Liu et al. (2009) examined Taiwanese students' educational expectations when they were in Grade 7, 9, and 11. They found that students' educational expectations positively predicted academic achievement and also academic achievement growth rates.

Besides expectancies, the *value* attached to the task has influence on students' achievement behaviors (Eccles & Wigfield, 2002; Wigfield, 1994). Individuals' interests for the task, importance of attainment of the task, and usefulness of the task constitute individuals' task value beliefs. Individuals do the task because they are interested in the topic, the topic is important or useful for their future career (Pintrich & Schunk, 2002). Generally studies have showed a positive relationship between task value beliefs and adaptive student outcomes, For instance, Yumusak, Sungur, and Cakiroglu (2007) found that high school students' task value belief was a significant and positive predictor of their biology achievement. In another study with seventh grade students, task value belief was significantly and positively related to students' use of cognitive and self-regulatory strategies (Pintrich & De Groot, 1990). Eccles and Wigfield (1995) found that value beliefs and expectancy beliefs were positively correlated. In their longitudinal study, Meece, Wigfield, and Eccles (1990) found that students' value

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beliefs about importance of the mathematics positively predicted students' intentions to continue enrolling more mathematics course. Similarly, Bong (2001) revealed that college students' value beliefs were significant predictors of their future course enrollment intentions.

According to expectancy-value theory, expectancies and values are influenced by individuals' judgments of their competence beliefs (Eccles & Wigfield, 2002). Domain specific judgments of ability beliefs are similar to Bandura's self-efficacy judgments (Pintrich & Schunk, 2002). *Self-efficacy* is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designed types of performances" (Bandura, 1986, p.391). Individuals who are more confident about their abilities to perform a given task are more likely to persist on the task and exert greater effort (Bandura, 1986). Shell, Murhy, and Bruning (1989) found that undergraduate students' self-efficacy beliefs and outcome expectations (i.e., whether reading is important for realizing life goals such as graduating from college and getting a good job) were significant predictors of their reading achievement. In regard to writing, while self-efficacy was a significant predictor of writing achievement, outcome expectancy was unrelated to writing achievement. In another study with undergraduate students, it was found that students' personal self-efficacy beliefs were positively correlated with their outcome expectations (Pajares & Johnson, 1993).

Previous research has also demonstrated that students' academic expectations vary according to gender, family socioeconomic status- especially parents' educational level, and parental influences (e.g., Hanson, 1994; Kao & Tienda, 1998; Trusty, 2000). For instance, Hanson (1994) examined students' educational expectations across gender and socioeconomic status. The researcher compared students' educational expectations in high school and after four years-in post high school years. It was found that men were more likely to reduce their academic expectations than women and men had more unrealized educational expectations than women. Students with higher socioeconomic status were less likely to reduce their academic expectations than students with low socioeconomic status. Kao and Tienda (1998) found that family socioeconomic status contributes to students' maintenance of educational aspirations from Grade 8 to grade 12. In a study with high school students, parent education level was a significant and positive predictor of students' academic expectations (Shumow, Lyutykh, & Schmidt, 2011). Parent involvement is generally associated with positive student outcomes such as students' ability to control their emotions, students' communication skills and interaction with peers, and students' academic skills such as staying on the task and being a self-starter (Hill & Craft, 2003); students' interest in science and science efficacy (Shumow et al., 2011); and students' school achievement (Astone & McLanahan, 1991).

Although there are some studies conducted abroad which investigated students' academic expectations as mentioned above, to our knowledge, no study from Turkey has investigated students' academic expectations in relation to student background and motivational beliefs in science. The present study aims to investigate predictive effect of gender, home educational resources, family involvement, and motivational beliefs of self-efficacy and task value in science on eight grade students' academic expectancies in Turkey. Motivational beliefs in *science* domain were focused in this study because domain specificity in motivational research is an important issue to consider (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Pintrich & Schunk, 2002). For instance, students may have different interests in English and in science subjects (Pintrich & Schunk, 2002).

METHOD

The sample of the study was drawn from Trends in International Mathematics and Science Studies (TIMSS) 2011 data set. TIMSS is an international assessment which is conducted by International Association for the Evaluation of Educational Achievement (IEA). TIMSS is conducted in every four years in order to measure 4th and 8th grade students' science and mathematics achievement. The last study was conducted in 2011 with participation of 63 countries around the world and Turkey is one of the participating countries. In the student questionnaire, besides student achievement in science and mathematics, students are asked

about many other topics such as background information, their attitudes towards learning, and their experiences in the class (TIMSS, 2013).

TIMSS uses two-stage random sample design; in the first stage a sample of schools are selected and in the second stage one or more intact classes of students are selected (Joncas & Foy, n.d.). In Turkey, from 240 classrooms in 239 schools, a total of 6928 eight grade students participated in the study.

Outcome variable of the present study was students' academic expectancy which was measured through the question "How far in your education do you expect to go?" Students who reported that they do not know were excluded from the study. Thus, the sample of the study consisted of 6331 eight grade students who participated in TIMSS 2011. There were 3176 (50.2%) boys and 3155 (49.8%) girls. The mean age of the students was 14.19 ($SD = .62$).

Besides academic expectancy, for the purpose of the present study, items which addressed gender, home educational resources, family involvement, self-efficacy, and task value in science were used.

Students' responses to question "How far in your education do you expect to go?" was used to form *academic expectancy* variable. Students who reported that they expect to finish secondary school were coded 0 while students who expected to complete university/higher education (undergraduate or graduate education) were coded 1.

Home educational resources was a derived variable computed in TIMSS data base. The variable was generated by utilizing items about number of books in the home, number of home study supports such as internet connection and own room, and highest level of education of either parent. The variable was constructed by using Item Response Theory (IRT). In order to facilitate interpretations, regions corresponding to low, some, and many resources were determined by using cutpoints (Martin, Mullis, Foy, & Arora, n.d.). Accordingly, the mean lower than 8.2 represents few resources, between 8.2 and 12.5 represents some resources, and mean higher than 12.5 represent many home educational resources.

Exploratory factor analysis (with principle axis factoring and promax rotation) was conducted in order to explore factor structure of the items used to assess family involvement, self-efficacy, and task value. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .862 and Barlett's test of sphericity was statistically significant, $\chi^2(78) = 31955.98$, $p < .001$, indicating that the data were suitable for factor analysis. Eigen value and scree plot suggested three factor structure.

The first factor included 5 items related to students' beliefs in their abilities to do well in science (e.g., "I usually do well in science" and "I am good at working out difficult science problems"). This factor was named *self-efficacy* in science. Item factor loading ranged from .70 to .77 and the first factor accounted for 35.10% of the variance in the correlation matrix. Reliability of the self-efficacy subscale as estimated by Cronbach alpha coefficient was .86.

The second factor was composed of 4 items related to value students attach to science (e.g. "I need science to learn other school subjects" and "I need to do well in science to get the job I want") and thus named science *task value*. Item factor loadings ranged from .51 to .94 and the second factor accounted for 15.09% of the variance in the correlation matrix. Cronbach alpha reliability coefficient of value subscale was .82.

The last factor included 4 items related to parents' involvement in students' school work (e.g., "I talk about my schoolwork with my parents" and "My parents ask me what I am learning in school"). This factor was named *family involvement*. Factor loadings of the items ranged from .56 to .70 and this factor accounted for 11.22% of the variance in the correlation matrix. Cronbach alpha reliability coefficient of family involvement subscale was .70.

Items of self-efficacy and task value were scored on a 4 point Likert scale from 1 "disagree a lot" to 4 "agree a lot" and items of family involvement were scored on a 4 point Likert scale from 1 "never or almost never" to 4 "every day or almost every day". By averaging items within each subscale, variables of self-efficacy, task value, and family involvement were computed.

RESULTS

There were 1408 (20.3%) students who expected to attain secondary education and 4923 (71.1%) students who expected to attain university education. Descriptive statistics for self-efficacy, task value, family involvement, and home educational resources were presented in Table 1. The mean scores for self-efficacy, task value, and family involvement were above scales' midpoint which means that students had high levels of self-efficacy and task value beliefs and reported high levels of parent involvement. The mean score for home educational resources indicated some resources in terms of number of books in the home, number of home study supports such as internet connection and own room, and education level of parents.

Table 1. *Descriptive Statistics*

Subscale	<i>M</i>	<i>SD</i>
Self-efficacy	2.95	.75
Task value	2.94	.85
Family involvement	3.14	.74
Home educational resources	8.34	2.07

Logistic regression was conducted to assess predictive effect of gender, home educational resources, family involvement, and science motivational beliefs variables (i.e., self-efficacy and task value in science) on students' academic expectancies. The model contained five independent variables (gender, home educational resources, family involvement, self-efficacy, and task value). The full model containing all predictors was statistically significant, $\chi^2(5, N= 6268) = 963.658, p < .001$ which indicated that the model was able to distinguish between students who expected to complete secondary education and who expected to complete higher education. The model as a whole explained between 14.3% (Cox and Snell R square) and 21.9% (Nagelkerke R square) of the variance in academic expectancy. The model correctly classified 79.4% of cases (whether student expected to complete secondary education or higher education). As shown in Table 2, four of the predictors (gender, home educational resources, family involvement, and self-efficacy) made a unique statistically significant contribution to the model while task value was not a significant predictor. The strongest predictor of expectancy to attain higher education was gender which was followed by self-efficacy, home educational resources, and family involvement, in order. Accordingly, girls reported higher levels of expectations to attain university education than boys. Home educational resources, family involvement, and self-efficacy all positively predicted students' expectations to complete higher education.

Table 2. *Logistic Regression Predicting Likelihood of Reporting to Attain Higher Education*

		<i>B</i>	<i>SE</i>	Wald	<i>df</i>	<i>p</i>	Odds Ratio	95% C.I. for Odds Ratio	
								Lower	Upper
Gender		.66	.07	94.54	1	.000	1.93	1.69	2.20
Home educational resources		.34	.02	339.89	1	.000	1.40	1.35	1.45
Family involvement		.29	.05	39.92	1	.000	1.33	1.22	1.46
Self-efficacy		.65	.05	160.54	1	.000	1.91	1.73	2.12
Task value		.02	.05	.23	1	.635	1.02	.94	1.12
Constant		-4.54	.22	422.36	1	.000	.01		

DISCUSSION

The present study attempted to investigate predictive effect of gender, home educational resources, family involvement, and science motivational beliefs variables (i.e., self-efficacy and task value in science) on students' academic expectancies. The sample of the study was 6331

eight grade students in Turkey who participated in TIMSS 2011. Logistic regression analysis results revealed that girls were more likely to expect to attain university education than boys. Home educational resources, family involvement, and self-efficacy in science emerged as significant and positive predictors of students' academic expectations to attain university education, as well.

The importance of having higher educational expectations was emphasized in the literature as it was positively linked to academic achievement (e.g., Bui, 2007; Liu et al., 2009). The present study showed that boys had lower academic expectations than girls which was consistent with earlier research findings (e.g., Kao & Tienda, 1998; Mau, 1995). Therefore, it can be suggested that boys may be encouraged to have higher academic expectations by their parents and teachers. Moreover, home educational resources were found to be a positive and significant predictor of students' academic expectations. This finding suggested that number of books in the home, number of home study supports such as internet connection and own room, and education level of parents may contribute to students' academic expectations. Previously, Kao and Tienda (1998) also found positive associations between prevalence of home resources and students' educational aspirations. Parent education level was also reported as a significant and positive predictor of high school students' academic expectations (Shumow et al., 2011). Studies from Turkey has generally investigated how student background characteristics are related to students' academic achievement, rather than students' academic expectations. For instance, in their national study with Grade 6-8 students in Turkey, Kalender and Berberoglu (2008) measured socioeconomic status through parents' education level, number of books at home, possession of a dishwasher at home, and having a separate table and room for studying at home. They found that socioeconomic status was strongly positively linked to students' science achievement at all grades. Similarly, using TIMSS 1999 data set of Turkey, Berberoglu, Celebi, Ozdemir, Uysal, and Yayan (2003) found that socioeconomic status, which was measured through number of books and parents' education level, was positively associated with students' science and mathematics achievement. In another study with Turkey's data from TIMSS 2007, Erberber (2009) also revealed that parental education and home educational resources were associated with students' science achievement.

Furthermore, the present study revealed that family involvement was a significant predictor of students' academic expectancies. Therefore, it seemed important that parents' asking their children what they were learning in school, talking with their children about school work, making sure that their children set aside time for homework, and checking whether their children do homework may have positive influences on students' educational expectations. Previously, Astone and Mclanahan (1991) found that students' expectations to be college students were positively related to their perceptions of whether their parents want them to graduate from college, whether parents monitor their progress, and parents' supervision. Another important finding of the present study was the positive relationship between self-efficacy in science and academic expectations. This finding implied that students who were more efficacious about their abilities to perform well in science had higher academic expectations. Students who believed that they usually do well in science, they learn things quickly in science, and they are good at working out difficult science problems were more likely to expect to attain university education. Previously, Mau (2003) also found that efficacy beliefs in mathematics were significant predictors of individuals' science and engineering career aspirations. Similarly, Pajares and Johnson (1993) reported that self-efficacy beliefs were associated with outcome expectations and they suggested that students' judgments of their capabilities were important determinants of their outcome expectations. Therefore, it seems important for science teachers to support their students' self-efficacy beliefs. Teacher may try to show their students that ability can be improved by exerting more effort. Students may be provided with authentic science tasks which may give students opportunities to improve their abilities. Teachers may help students to see their progress and link their accomplishments to effort they put forth. If students see the relationship between effort and achievement, this may positively influence their judgments about abilities (Kahraman & Sungur, 2011; Paulsen &

Feldman, 2005). However, Berberoğlu (2007) studying with PISA 2003 data found that in Turkey, communication between students and teachers are rather weak, students are not encouraged by their teachers to use all their capacities, and teachers have low academic expectations for their students. Therefore, it is important for educational policies in Turkey to seriously consider teachers' communication skills, attitudes, and expectation for students.

In conclusion, the present study revealed that students' academic expectations were related to their gender, home educational resources, family involvement, and self-efficacy beliefs in science. Being cross-sectional and correlational in nature, findings of the study help to understand the relationships between academic expectations and predictors of interest but do not allow for making cause-effect relationships. In further studies, students' academic expectations may be studied in longitudinal studies and changes in students' academic expectation may be examined.

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