

Relationship Between Motivational Orientations, Metacognitive Adaptations and Academic Successes of Doctorate Students*

Doktora öğrencilerinin motivasyonel yönelimleri, metabilşsel adaptasyonları ve akademik başarıları arasındaki ilişki

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Özet

Motivasyonel yönelimler ve zor durumlarda sergilenen metabilşsel adaptasyonlar, öğrencilerin akademik başarısını etkileyen iki önemli faktördür. Bu araştırmanın amacı, Sağlık Bilimleri Enstitüsü'ne devam eden doktora öğrencilerinin motivasyonel yönelimleri, metabilşsel adaptasyonları ve akademik başarıları arasındaki ilişkiyi incelemektir. 139 öğrenci ile yapılmış bu çalışmada, Modifiye Edilmiş Archer'ın Sağlık Profesyonelleri Motivasyon Ölçeği, Pozitif Metabilş ve Pozitif Meta Duygular Ölçeği ve performans değerlendirme formları kullanılmıştır. Çalışmada; metabilşsel adaptasyonları yüksek olan doktora öğrencilerinin takıntılı davranışları ve duyguları ortadan kaldırmaya yönelik kendine güven duyma düzeylerinin performansa yönelik hedef yönelimlerine, akademik yabancılaşma ve yüzeysel öğrenme stratejilerini kullanma durumuna göre anlamlı olarak farklılaştığı saptanmıştır. Kendi duygu ve düşüncelerini ipucu olarak kullanma, ani reaksiyonu kısıtlama, problem çözmeye yönelik kendine güven duyma, esnek ve gerçekleştirilebilir hedefler hiyerarşisi oluşturmaya yönelik kendine güven duyma düzeylerinin akademik yabancılaşma, metabilşsel öğrenme stratejilerini kullanma ve içsel kontrol düzeylerine göre anlamlı olarak farklılaştığı ($p<0.05$) bulunmuştur. Ders ve tez aşamasındaki öğrencilerin akademik başarılarının metabilşsel öğrenme stratejilerini kullanma düzeylerine, esnek ve gerçekleştirilebilir hedefler hiyerarşisi oluşturmaya yönelik kendine güven duyma düzeylerine göre anlamlı olarak farklılaştığı ($p<0.05$) saptanmıştır.

Anahtar sözcükler: Mezuniyet sonrası eğitim, öğrenenlerin özellikleri, performans değerlendirme.

Abstract

Motivational orientations and metacognitive adaptations displayed in difficult situations are the two major factors that affect the academic success of students. The aim of this study is to examine relationship between motivational orientations, metacognitive adaptations and academic successes of doctorate students attending to Health Sciences Institute. In this study conducted on 139 students The Modified Archer's Health Professions Motivation Survey, The Positive Metacognitions and Positive Meta-Emotions Questionnaire and performance evaluation forms were used. In the study where metacognitive adaptation levels of doctorate students were found high, their self-confidence levels in extinguishing perseverative thoughts and emotions were found to be significantly different in comparison to their levels of goal orientations towards performance, academic alienation and their use of superficial learning strategies. Their self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving, establishing flexible and feasible hierarchy of goals were also found to be significantly different in comparison to their levels of academic alienation, use of metacognitive learning strategies, and internal control ($p<0.05$). It was also observed that academic success of the students at course and thesis stages were found to be significantly different as compared to their level of metacognitive learning strategies, self-confidence levels for setting flexible/feasible hierarchy of goals ($p<0.05$).

Keywords: Learner's characteristics, performance evaluation, postgraduate education.

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In the last decades, self-regulated learning has become one of the important concepts covered in educational sciences and psychology. One of the key factors in health science is to have an impact on the undergraduate and postgraduate academic achievement of students and to transform the graduates into life-long learners. Self-regulated learners are those who are capable of regulating their own motivational tendencies or attitudes, cognitive strategies and metacognitive strategies. From a motivational point of view, self-regulating learners possess the motives to trigger the desire to perform a task and sustain the performance and the adaptive beliefs to adjust for a variety of different situations (Wolters, 2003).

Studies conducted on self-regulation during the 1990s mostly focused on the cognitive processes of learners regarding how to reach the goals. Later on, studies focusing on the motivational processes that affect self-regulation (goal orientations, self-efficacy, beliefs, interests, etc.) started to become more prevalent. Goal orientation (one of the motivational factors) is examined in two distinct categories, namely, learning/mastery oriented goal orientation and performance oriented goal orientation (Wolters, Yu, & Pintrich, 1996). Learning oriented goal orientation enables individuals better observe themselves and more intensive use of in-depth learning strategies (Pintrich & De Groot, 1990; Pintrich & Garcia, 1991) According to Harackiewicz, Barron, and Elliot (1998), goals set towards learning and mastery ensure the interest and intrinsic motivation of learners.

Causal attributions, another one among the motivational factors, are the perceptions of learners regarding the causes of their own academic outcomes (Schunk & Zimmerman, 2009). Intrinsic/extrinsic controls are among the characteristics of learners, which play a role in shaping these perceptions and have an impact on the success of learning (Reed, 2007).

Metacognition (another factor in self-regulated learning) is the awareness thinking control of an individual over the cognitive process and strategies (Flavell, 1979). Metacognition, in general, enables learners to do the planning and order setting of tasks towards the performance and to observe their own learning processes, make necessary reviews and changes (Schraw & Dennison, 1994; Schraw & Moshman, 1995; Schunk, 2004). Metacognitive process is effective on the way learners reflect on the problem, when they are faced with a challenge and make decisions to overcome the problem. Learners who skillfully use the metacognitive strategies, demonstrate their ability to deal with new and difficult situations successfully, and are self-confident in life-long learning (Perrot, Deloney, Hastings, Savell, & Savidge, 2001). Use of

metacognitive strategies in the learning process is also associated with the goal orientation of students. Archer (1994) found that learners with task/goal orientation tend to use metacognitive strategies at higher levels, while performance-oriented individuals use superficial learning strategies more often. Along with the concepts of metacognition, there is one more concept referred to as adaptive metacognitive regulation. Adaptive metacognitive regulation is the regulation and control of cognition in challenging circumstances, problems and situations of uncertainty (Beer & Moneta, 2010).

Motivational orientation and adaptive metacognitive competencies of students are among the factors that affect the academic success in undergraduate and postgraduate education, life-long learning and self-regulated learning, along with the performance to cope with difficult situations (Beer & Moneta, 2010; Beer & Moneta, 2011; Coutinho, 2007; Perrot et al., 2001). In recent years, there is an increase in the number of studies on “motivation” and “metacognitive strategies” acting on self-regulated learning. Studies on these issues are now revealing the motivational orientations and metacognitive adaptation affecting the self-regulation of learners, academic achievement, the way they become life-long learners, the way they deal with difficult situations, and the role these factors play in the development of problem-solving skills; and in the light of the data obtained, attempts have been made to build learning environments that will enable the learners to improve their motivational orientations and metacognitive adaptations (Azevedo, 2005; Lin, Schwartz, & Hatano 2005; Schmidt & Ford, 2003).

In the literature, there are studies conducted separately on motivation and metacognition along with studies investigating the relationship between motivation and metacognition and a close examination of these studies show that they have been carried out mostly with primary and secondary level students and aimed to probe the relationship between academic success, motivation and metacognitive strategies in general.

This study aims to fill the gap of relative lack of studies on motivational orientations, metacognitive strategies and academic achievements of postgraduate students and also to answer the need for research efforts examining the metacognitive adaptations of students to cope with difficult situations and the relationship of these adaptations with their academic achievement. In this context, there are three research questions of this study:

- Are there significant differences among the learners’ metacognitive adaptation levels exhibited under difficult circumstances according to their motivational orientation levels?



- Are there significant differences among the learners' motivational orientations according to their academic success?
- Are there significant differences among the learners' metacognitive adaptation levels exhibited under difficult circumstances according to their academic success?

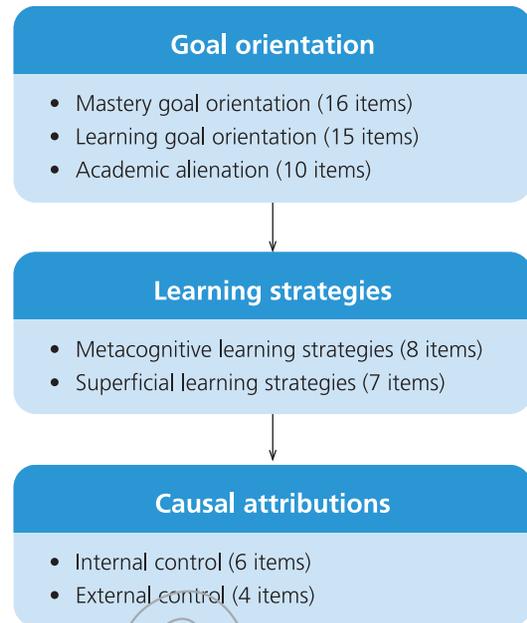
Methods

The study was conducted on doctorate students (n=139) attending to Health Sciences Institute of Marmara University (Medicine, Health Sciences, Dentistry and Pharmacy Faculties) in the 2011–2012 academic year. In the present study, two surveys were used and before the application of surveys, the research was explained to the participants and informed consent was taken from them. For this research, ethical approval was taken from the Ethical Committee of Health Sciences Institute, Marmara University. For the research, the students answered the two scales below, which were translated into Turkish and for which a validity and reliability study was conducted.

Firstly, *Modified Archer's Health Professions Motivation Survey* (Perrot et al., 2001) was used for determining the motivational orientations of students. Archer's Motivation Survey has been modified by Perrot et al. (2001) with validity and reliability study for health sciences students. Modified Archer's Health Professions Motivation Survey's dimensions and item numbers are illustrated in ■ Figure 1. For determining metacognitive adaptations of students, *The Positive Metacognitions and Positive Meta-Emotions Questionnaire* (Beer & Moneta, 2010) was also used. The Positive Metacognitions and Positive Meta-Emotions Questionnaire's dimensions and item numbers are illustrated in ■ Figure 2.

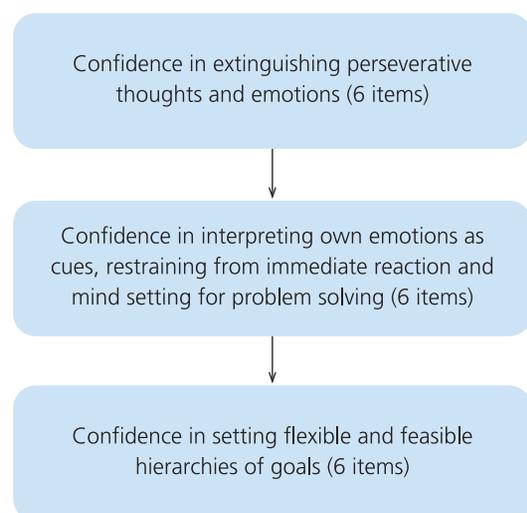
Preparing the Turkish Version of the Scales and Reliability Study

The linguistic validity and reliability studies for the scales used in the research were conducted as follows: First of all, the scales used in the thesis study were translated from English to Turkish by a translator. The scales in English and their translations into Turkish were separately evaluated by one lecturer from the departments of Physiology, Medical Education, Sociology, Public Health and Family Medicine, and a specialist on English, and necessary corrections were made on the translated scales. Moreover, the scales were translated back to English from Turkish in order for the compatibility with the expressions on the original scales to be evaluated. Following these studies, the forms in Turkish, on which a reconciliation was reached, were applied to 6 masters degree students from Health Sciences Institute of Marmara University (a pilot



■ Fig. 1. Modified Archer's Health Professions Motivation Survey dimensions.

scheme). The scales were given their final forms after the corrections made as a result of the feedback received. The validity and reliability analyses of scales were conducted both on the level of each item and in the context of sub-dimensions with Cronbach's alpha. It was determined that *Modified Archer's Health Professions Motivation Survey's* "Goal Orientation"



■ Fig. 2. The Positive Metacognitions and Positive Meta-Emotions Questionnaire.

dimension's Cronbach's alpha was 0.870; "Learning Strategies" dimension's Cronbach's alpha was 0.618; "Causal Attributions" dimension's Cronbach's alpha was 0.677; *The Positive Metacognitions and Positive Meta-Emotions Questionnaire's* "Confidence in Extinguishing Perseverative Thoughts and Emotions" dimension's Cronbach's alpha was 0.616; "Confidence in Interpreting Own Emotions as Cues, Restraining from Immediate Reaction and Mind Setting for Problem Solving" dimension's Cronbach's alpha was 0.821; "Confidence in Setting Flexible and Feasible Hierarchies of Goals" dimension's Cronbach's alpha was 0.857. Even though a value of 0.70 is generally accepted for reliability in the literature, lower values can be acceptable, considering the differences in test structure such as the number of items to measure and the width of the scale used to evaluate each item (Field, 2005, p. 666–676).

In order to evaluate the academic performance of doctorate students during the course or thesis periods, two separate evaluation forms were filled by the instructors or thesis supervisors. The evaluation criteria on the performance evaluation forms, which was designed to evaluate the overall performances of the courses received by the doctorate students during a semester, was identified as preparation before the course, participation to the course, decision-making and problem solving skill, critical thinking skill, presentation material preparing, capability in laboratory practices (technical skills, obeying ethical rules, professionalism, research designing) and reaching goals after completing the course. On the other hand, the following evaluation criteria have been taken into consideration in designing the performance evaluation form intended to evaluate the overall performances of doctorate students at thesis stage during the interim period of six months: abilities to do literature search for the thesis subject, to analyze and integrate the data, to prepare the interim reports, to establish effective communication with the supervisor faculty member and faculty members at the thesis jury, to manage time, to use clear and comprehensible language in the reports and finally the capability in laboratory practices (technical skills, obeying ethical rules, professionalism, research designing). The performance evaluation forms were designed in a way that they are associated with self-regulated learning. In order to determine the academic success of students, feedbacks were received from six academicians of various departments that embody doctoral programs within the body of Marmara University's Health Sciences Institute with regards to the forms prepared as two separate performance evaluation forms so as to be filled in by the trainers of thesis advisors with the aim of evaluating the performances of PhD students at the lecture and dissertation stages (face validity). Following the pilot scheme, necessary corrections were made on the forms, which were used later on in the research after having been given their final forms.

Re-Arrangement and Analysis of Data

The opinions on the statements in Modified Motivation Survey were scored with 5-point Likert scale, while on the Positive Metacognition and Positive Meta-Emotions Questionnaire opinions were scored with 4-point Likert scale. To determine the levels in sub-dimensions, the points given to the items constituting the each sub-dimension of Health Professions Motivation Survey were summed up, and divided to the number of items constituting the sub-dimension. As the data are not normally distributed, the data were re-organized in categories and the chi-square test was conducted. In 5-point Likert scale, 3.49 was determined as cutoff score; ≤ 3.49 as low-medium; and > 3.49 as high level, and the data were rendered dual categorical before the analyses. Cutoff 3.49 was because the distribution was right. In a similar way, to determine the levels in sub-dimensions the points given to the items constituting the each sub-dimension of the Positive Metacognition and Positive Meta-Emotions Questionnaire were summed up, and divided to the number of items constituting the sub-dimension. Then, in 4-point Likert scale, 2.49 was determined as cutoff score; ≤ 2.49 as low; and > 2.49 as high level, and the data were rendered dual categorical. Cutoff 2.49 was taken because the responses "I do not agree / agree slightly" are expressed on scale 1 and 2, 3 and 4 expressed the response "fairly / completely agree".

In the performance evaluation forms used during the course and thesis periods, the points given for each item were added up and the sum was divided into the total number of items constituting the scale to find their arithmetic average. The evaluations with an arithmetic average of < 4.00 were categorized as "weak", those with 4.00–5.99 were categorized as "borderline", those with 6.00–7.99 were categorized as "good" and those with > 8.00 were categorized as "very good".

The data obtained in the research were analyzed by use of SPSS 17.0 statistics program (SPSS Inc., Chicago, IL, USA). The level of significance in all statistical transactions was accepted as 0.05. The frequency distributions of students' motivational orientations and positive metacognitive and positive meta-emotions were calculated. Differences between the students' motivational orientations, metacognitive adaptations, socio-demographic variables and academic successes were analyzed by chi-square test. The strength of the relationship were assessed by the *Phi* coefficient where the *phi* coefficient between -1.0 to -0.7 denoted strong negative association, -0.7 to -0.3 denoted moderate negative association, -0.3 to +0.3 denoted low or no association, +0.3 to +0.7 moderate positive association and +0.7 to +1.0 denoted strong positive association (De Muth, 2014, p. 452–453).



Results

It was found out that 76.3% of doctorate students were woman, 65.5% of them were unmarried, 48.9% of them continued on their doctorate education at the faculty of dentistry, 20.1% at the faculty of health sciences and 19.4% at the faculty of medicine. Considering the education period, 60.4% of them were at their thesis stage.

Motivational Orientations of Doctorate Students

It was understood that 56.1% of students had high level, 43.9% of them had low-medium level of performance goal orientation; 83.5% of them had high level of mastery goal orientation and only 14.4% of them had high level of academic alienation. Regarding learning strategies and causal attributions, 84.2% of students used their metacognitive learning strategies at high level, while 90.6% of students used superficial learning strategies at low-medium level; 56.1% of students had high level, 43.9% of them low-medium level internal control, and 69.8% had low-medium level external control (■ Table 1).

With regards to goal orientation for performance, there were no significant differences between students' performance goal orientation, mastery goal orientation and academic alienation levels according to their gender ($p>0.05$). Between students' goal orientation sub-dimensions there was only significant difference between students' mastery goal orientation levels according to their doctorate education stage ($p<0.05$). At thesis stage, students' mastery goal orientation levels were significantly higher than those of students at course stage. However, according to their gender and doctorate education stage, there were no significant differences between students' levels of using learning strategies and internal control and external control levels ($p>0.05$).

Metacognitive Adaptations of Doctorate Students

The present study showed that 66.2% of students had a high level, 33.8% of them had low level of self-confidence in extinguishing perseverative thoughts and emotions; 80.6% of them had a high level of self-confidence in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving and 79.1% of students had a high level of self-confidence in establishing flexible and feasible hierarchy of goals (■ Table 2).

There were no significant differences between students' self-confidence levels in extinguishing perseverative thoughts and emotions, self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction and

■ Table 1. Frequencies of students' motivational orientation levels.

A. Sub-dimensions of goal orientation		
	n	%
Level of performance goal orientation		
Low-Medium	61	43.9
High	78	56.1
Total	139	100.0
Level of mastery goal orientation		
Low-Medium	23	16.5
High	116	83.5
Total	139	100.0
Level of academic alienation		
Low-Medium	119	85.6
High	20	14.4
Total	139	100.0
B. Sub-dimensions of learning strategies		
	n	%
Using metacognitive learning strategies		
Low-Medium	22	15.8
High	117	84.2
Total	139	100.0
Using superficial learning strategies		
Low-Medium	126	90.6
High	13	9.4
Total	139	100.0
C. Sub-dimensions of causal attributions		
	n	%
Level of internal control		
Low-Medium	61	43.9
High	78	56.1
Total	139	100.0
Level of external control		
Low-Medium	97	69.8
High	42	30.2
Total	139	100.0

■ Table 2. Frequencies of students' metacognitive adaptation levels.

Self-confidence levels in extinguishing perseverative thoughts and emotions		
	n	%
Low	47	33.8
High	92	66.2
Total	139	100.0
Self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving		
	n	%
Low	27	19.4
High	112	80.6
Total	139	100.0
Self-confidence levels in establishing flexible and feasible hierarchy of goals		
	n	%
Low	29	20.9
High	110	79.1
Total	139	100.0

mind setting for problem solving and self-confidence levels in establishing flexible and feasible hierarchy of goals according to their gender and doctorate education stage ($p>0.05$).

Motivational Orientations and Metacognitive Adaptations of Doctorate Students

As it is seen in Table 3, there was a significant difference between students' self-confidence levels for extinguishing perseverative thoughts and emotions according to their performance goal orientation, academic alienation and using superficial learning strategies levels ($p<0.05$). Students who have medium-low performance goal orientation levels, academic alienation levels and superficial learning strategies had significantly higher self-confidence levels for extinguishing perseverative thoughts and emotions. Also, there were significant differences between students' self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving, self-confi-

dence levels for establishing flexible and feasible goals hierarchy according to their level of using metacognitive learning strategies, internal control and academic alienation ($p<0.05$). Students who have high level of using metacognitive learning strategies and internal control had significantly higher self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction, mind setting for problem solving and self-confidence levels for establishing flexible and feasible goals hierarchy. Students who have medium-low level of academic alienation had significantly higher self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction, mind setting for problem solving and self-confidence levels for establishing flexible and feasible goals hierarchy.

Considering the strength of the relationship, there are negative low associations between self-confidence levels in extinguishing perseverative thoughts/emotions and performance goal orientation level ($\Phi=-0.234, p=0.006$), academic alienation level ($\Phi=-$

Table 3. The distribution of students' positive metacognition and positive meta-emotions related with their motivational orientations.

Sub-scales of motivational orientations		Sub-scales of positive metacognition and positive meta-emotions											
		Self-confidence levels in extinguishing perseverative thoughts and emotions				Self-confidence levels in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving				Self-confidence levels in establishing flexible and feasible hierarchy of goals			
		Low n (%)	High n (%)	Total n	Phi (p)	Low n (%)	High n (%)	Total n	Phi (p)	Low n (%)	High n (%)	Total n	Phi (p)
Level of performance goal orientation	Low-Medium	13 (21.3)	48 (78.7)	61	-0.234	11 (18.0)	50 (82.0)	61	-0.031	12 (19.7)	49 (80.3)	61	-0.026
	High	34 (43.6)	44 (56.4)	78	(0.006)	16 (20.5)	62 (79.5)	78	(0.714)	17 (21.8)	61 (78.2)	78	(0.760)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Level of mastery goal orientation	Low-Medium	7 (30.4)	16 (69.6)	23	-0.032	7 (30.4)	16 (69.6)	23	0.124	7 (30.4)	16 (69.6)	23	0.105
	High	40 (34.5)	76 (65.5)	116	(0.708)	20 (17.2)	96 (82.8)	116	(0.144)	22 (19.0)	94 (81.0)	116	(0.216)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Level of academic alienation	Low-Medium	36 (30.3)	83 (69.7)	119	-0.184	17 (14.3)	102 (85.7)	119	-0.317	21 (17.6)	98 (82.4)	119	-0.193
	High	11 (55.0)	9 (45.0)	20	(0.030)	10 (50.0)	10 (50.0)	2	(0.000)	8 (40.0)	12 (60.0)	20	(0.023)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Use of metacognitive learning strategies	Low-Medium	8 (36.4)	14 (63.6)	22	0.023	9 (40.9)	13 (59.1)	22	0.235	10 (45.5)	12 (54.5)	22	0.262
	High	39 (33.3)	78 (66.7)	117	(0.783)	18 (15.4)	99 (84.6)	117	(0.005)	19 (16.2)	98 (83.8)	117	(0.002)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Use of superficial learning strategies	Low-Medium	39 (31.0)	87 (69.0)	126	-0,188	26 (20.6)	100 (79.4)	126	0,095	29 (23.0)	97 (77.0)	126	0,165
	High	8 (61.5)	5 (38.5)	13	(0.026)	1 (7.7)	12 (92.3)	13	(0.261)	0 (0.0)	13 (100.0)	13	(0.052)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Level of internal control	Low-Medium	23 (37.7)	38 (62.3)	61	0.073	18 (29.5)	43 (70.5)	61	0.225	20 (32.8)	41 (67.2)	61	0.260
	High	24 (30.8)	54 (69.2)	78	(0.391)	9 (11.5)	69 (88.5)	78	(0.008)	9 (11.5)	69 (88.5)	78	(0.002)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	
Level of external control	Low-Medium	30 (30.9)	67 (69.1)	97	-0.093	17 (17.5)	80 (82.5)	97	-0.073	20 (20.6)	77 (79.4)	97	-0.009
	High	17 (40.5)	25 (59.5)	42	(0.275)	10 (23.8)	32 (76.2)	42	(0.390)	9 (21.4)	33 (78.6)	42	(0.914)
	Total	47 (33.8)	92 (66.2)	139		27 (19.4)	112 (80.6)	139		29 (20.9)	110 (79.1)	139	



0.184, $p=0.030$) or use of superficial learning strategies ($Pbi=-0.188$, $p=0.026$). There is a moderate negative association between self-confidence levels in interpreting own emotions as cues/restraining from immediate reaction/mind setting for problem solving and academic alienation level ($Pbi=-0.317$, $p=0.000$) whereas the associations between use of metacognitive learning strategies ($Pbi=0.235$, $p=0.005$) or level of internal control ($Pbi=0.225$, $p=0.008$) are low positive. The association between self-confidence levels in establishing flexible/feasible hierarchy of goals and academic alienation level is slightly negative ($Pbi=-0.193$, $p=0.023$). Lastly, there are low positive associations between self-confidence levels in establishing flexible/feasible hierarchy of goals and use of metacognitive learning strategies ($Pbi=0.262$, $p=0.002$) or level of internal control ($Pbi=0.260$, $p=0.002$).

Academic Success (Performance Evaluations) of Doctorate Students

As a result of analyses, at course stages, 48.8% of students' performance evaluations were good, 46.5% of them were very good; while at thesis stage, 82.1% of students' performance evaluations were very good (■ Table 4).

Doctorate students' Motivational Orientations and Their Academic Success

When all doctorate students at course and thesis stages were evaluated together (■ Table 5), students' performance evaluations did not differ significantly according to their goal orientations and causal attributions ($p>0.05$). Regarding the learning strategies, 68.9% of students with a high level of metacognitive learning strategies and 65.2% of students with low-medium level of superficial learning strategies showed "very good" performance; while in 66.7% of students with a low-medium level of metacognitive learning strategies and, 57.1% of students with high level of superficial learning strategies, performance evaluations were "good". Doctorate students' performance evaluations differed significantly according to their levels of using metacognitive learning strategies ($p<0.05$), but did not differ significantly according to their superficial learning strategies usage levels ($p>0.05$). Students' who have high level of metacognitive learning strategies had significantly higher academic success.

Doctorate Students' Academic Success and Their Metacognitive Adaptations

Considering the academic success and metacognitive adaptations, the performance evaluations of all doctorate students did not differ significantly according to their level of self-confi-

dence for extinguishing perseverative thoughts and emotions, as well as in interpreting own emotions as cues, restraining from immediate reaction and mind setting for problem solving ($p>0.05$). While, students' performance evaluations were differed significantly according to their self-confidence levels in establishing flexible and feasible hierarchy of goals ($p<0.05$). Students who have high level of self-confidence levels in establishing flexible and feasible hierarchy of goals had significantly higher academic success. 67.2% of students with a high level of self-confidence levels in establishing flexible and feasible hierarchy of goals showed "very good" performance, while in 66.7% of students with a low level of self-confidence levels in establishing flexible and feasible hierarchy of goals, performance evaluations were "good" (■ Table 6).

Discussion

When data on the motivational orientations of doctorate students are taken into account, it demonstrates that 80–90% of students have high level of mastery goal orientation and metacognitive learning strategies usage, low-medium level of academic alienation and superficial learning strategies usage. As a result of the analyses, the mastery goal orientation level and academic alienation level differ to a significant extent depending on the current stage of education. Similarly, in a study conducted by Perrot et al. (2001), 63.0% of the students of health sciences (medicine, nursing and pharmacy) had mastery goal orientation and 26.0% of them had performance goal orientation. The students had rather internal control in terms of the causal attributions and they preferred rather metacognitive learning strategies (Perrot et al., 2001).

In the present study, the motivational orientations of students were investigated in cross-sectional way. In one of the longitudinal studies, investigating how these parameters evolved

■ Table 4. Frequencies of students' performance evaluations.

Performance evaluation	Evaluation	n	%
Students at course stages	Borderline	2	4.7
	Good	21	48.8
	Very good	20	46.5
	Total	43	100.0
Students at thesis stage	Borderline	3	4.5
	Good	9	13.4
	Very good	55	82.1
	Total	67	100.0
All students at course and thesis stages	Borderline	5	4.5
	Good	30	27.3
	Very good	75	68.2
	Total	110	100.0

Table 5. The distribution of performance evaluations of students related with their motivational orientations.

Goal orientations		Performance evaluations of all students at course and thesis stages				p^*
		Borderline <i>n</i> (%)	Good <i>n</i> (%)	Very good <i>n</i> (%)	Total <i>n</i> (%)	
Level of performance goal orientation	Low-Medium	1 (2.9)	13 (38.2)	20 (58.8)	34 (100.0)	0.489
	High	0 (0.0)	13 (33.3)	26 (66.7)	39 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	
Level of mastery goal orientation	Low-Medium	0 (0.0)	6 (54.5)	5 (45.5)	11 (100.0)	0.191
	High	1 (1.6)	20 (32.3)	41 (66.1)	62 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	
Level of academic alienation	Low-Medium	1 (1.6)	20 (32.3)	41 (66.1)	62 (100.0)	0.191
	High	0 (0.0)	6 (54.5)	5 (45.5)	11 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	

Learning strategies		Performance evaluations of all students at course and thesis stages				p^*
		Borderline <i>n</i> (%)	Good <i>n</i> (%)	Very good <i>n</i> (%)	Total <i>n</i> (%)	
Use of metacognitive learning strategies	Low-Medium	0 (0.0)	8 (66.7)	4 (33.3)	12 (100.0)	0.020
	High	1 (1.6)	18 (29.5)	42 (68.9)	61 (100.0)	
Use of superficial learning strategies	Low-Medium	1 (1.5)	22 (33.3)	43 (65.2)	66 (100.0)	0.245
	High	0 (0.0)	4 (57.1)	3 (42.9)	7 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	

Causal attributions		Performance evaluations of all students at course and thesis stages				p^*
		Borderline <i>n</i> (%)	Good <i>n</i> (%)	Very good <i>n</i> (%)	Total <i>n</i> (%)	
Level of internal control	Low-Medium	0 (0.0)	13 (43.3)	17 (56.7)	30 (100.0)	0.348
	High	1 (2.3)	13 (30.2)	29 (67.4)	43 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	
Level of external control	Low-Medium	1 (2.0)	18 (35.3)	32 (62.7)	51 (100.0)	0.942
	High	0 (0.0)	8 (36.4)	14 (63.6)	22 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	

*Chi-square test was analysed as combining borderline and good categories.

during the educational process, the mastery goal orientations of first year pharmacy students declined to a significant extent at the end of one year, while the academic alienation rose signifi-

cantly; and their internal control levels fell down significantly (Hastings, West, Perrot, & Deloney, 2001). Another study conducted with a similar purpose showed that the first year students

Table 6. The distribution of performance evaluations of students related with their positive metacognition and positive meta-emotions.

Positive metacognition and positive meta emotions		Performance evaluations of students at course and thesis stages				p^*
		Borderline <i>n</i> (%)	Good <i>n</i> (%)	Very good <i>n</i> (%)	Total <i>n</i> (%)	
Self-confidence levels in extinguishing perseverative thoughts and emotions	Low-Medium	0 (0.0)	9 (34.6)	17 (65.4)	26 (100.0)	0.755
	High	1 (2.1)	17 (36.2)	29 (61.7)	47 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	
Self-confidence levels in interpreting own emotions as cues, restraining immediate reaction and mind setting for problem solving	Low-Medium	0 (0.0)	6 (54.5)	5 (45.5)	11 (100.0)	0.191
	High	1 (1.6)	20 (32.3)	41 (66.1)	62 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	
Self-confidence levels in establishing flexible and feasible hierarchy of goals	Low-Medium	0 (0.0)	6 (66.7)	3 (33.3)	9 (100.0)	0.049
	High	1 (1.6)	20 (31.3)	43 (67.2)	64 (100.0)	
	Total	1 (1.4)	26 (35.6)	46 (63.0)	73 (100.0)	

*Chi-square test was analysed as combining borderline and good categories.



of faculty of pharmacy had higher mastery goal orientation at the beginning, but a significant downfall happened in their mastery goal orientations at the end of one year, and a rise occurred in their academic alienation levels (Hastings, West, & Hong, 2005). The rise detected in academic alienation was not significant. In addition, there was significant decline over the years in internal control level points of students, whereas there was increase over the years in the external control level points of them; but the increase in external control level points was not significant (Hastings et al., 2005).

In the literature, there are limited studies about metacognitive adaptations in the face of difficult situations. One of these studies, investigated the harmonizing metacognitive regulation strategies in the face of difficult and uncertain conditions, semi-structured interviews with 13 managers were carried out (Beer & Moneta, 2011). In the interviews, the participants were reminded of the difficult and uncertain situations they encountered in the past, and were asked about their feelings and behaviors while dealing with those situations and how they ended challenging situations with positive result. As a result of the study, the participants deployed three individual positive metacognitive and positive meta-emotional regulation strategies including confidence in extinguishing perseverative thoughts and emotions in the face of difficult and uncertain situations; being self-confident for interpreting one's own feelings as clues, restricting sudden reaction, reasoning for problem solving, and finally being self-confident for establishing flexible and feasible goal hierarchy (Beer & Moneta, 2011). In another study conducted with 313 people, it was aimed to determine the positive metacognitive and positive meta-emotional strategies exhibited in the face of difficult and uncertain situations (Beer, 2011). In this research, which studied on the reliability and validity of the Positive Metacognitive and Positive Meta-emotions Questionnaire taken as basis from the previous quantitative research, the questionnaire of positive metacognitive and positive meta-emotions formerly consisting of totally 49 items was converted through factor analysis into a scale consisting of 18 items and three separate dimensions including confidence in extinguishing perseverative thoughts and emotions; being self-confident for interpreting one's own feelings as clues, restricting sudden reaction, reasoning for problem solving, and finally being self-confident for establishing flexible and feasible goals hierarchy (Beer, 2011).

In this study which was conducted by use of three-dimensional scale with 18 items (Beer & Moneta, 2010), approximately 80% of the students have high level of self-confidence for utilizing their own feelings and thoughts as clues, restricting sudden reaction, reasoning for problem solving, establish-

ing a hierarchy of flexible and realizable goals, while 66.2% of them have high level of self-confidence for extinguishing perseverative thoughts and emotions. Furthermore, the doctorate students' levels of being self-confident for extinguishing perseverative thoughts and emotions differ to a significant extent depending on their performance goal orientation levels, academic alienation levels and superficial learning strategies using levels. These findings suggest that the students with low performance goal orientation levels, academic alienation levels and superficial learning strategies using levels have higher self-confidence for extinguishing perseverative thoughts and emotions. Also, the doctorate students' level of being self-confident for using one's own feelings and behaviors as clue, restricting sudden reaction, reasoning for problem solving, as well as their level of being self-confident for establishing a hierarchy of flexible and feasible goals differ to a significant extent according to their academic alienation levels, metacognitive learning strategies using levels and internal control levels. In a study Beer and Moneta (2010) conducted with a total of 474 people, there was a positive medium degree correlation between the intrinsic motivation and the dimension of scale of positive metacognitive and positive meta-emotions described as being self-confident for interpreting one's own feelings as clue, restricting sudden reaction, and reasoning for problem solving, and again, between the intrinsic motivation and its dimension described as being self-confident for establishing a hierarchy of flexible and realizable goals. On the other hand, there was a negative medium correlation between the extrinsic motivation and the dimension of scale of positive metacognitive and positive meta-emotions described as being self-confident for extinguishing perseverative thoughts and emotions (Beer & Moneta, 2010). In another study conducted by Sperling, Howard, Staley, and Du Bois (2004), the correlations between the motivation, metacognition, cognitive strategies and academic success of the university students attending the academic strategies course were investigated by using the metacognitive scale and learning strategies survey, Scale of Motivating Strategies in Learning, as well as the high school graduation averages and SAT points. There was a significant correlation between the total score of metacognition scales and the scores of learning strategies survey, and between the metacognition and motivation Sperling et al. (2004).

Considering the academic performance of doctorate students, when we investigated the distribution of overall performance evaluation levels of doctorate students to their motivational orientations, we found out that the overall performance evaluation levels were closer to each other in groups with



low-medium or high performance goal orientation while the overall performance levels were higher in students' with high level of mastery goal orientation and low-medium level of academic alienation, but the differences between them did not turn out to be statistically significance. We also determined that the students who use metacognitive learning strategies at higher level and the students with higher levels of internal control have better overall performance evaluations.

There are a great deal of studies in the literature investigating the correlations between the motivations and academic success levels of students. In a study conducted by So (2008), which investigated the correlations between goal orientations, self sufficiency, interest and academic success, the academic successes of premedical students were positively correlated with performance goal orientation, mastery goal orientation and self-sufficiency, and the academic successes of first-year medical students were positively correlated with performance goal orientation and mastery goal orientation (So, 2008). In third-year medical students, the performance goal orientations and self-sufficiencies were positively correlated with academic success. The mastery goal orientations of premedical students and self-sufficiency of third-year medical students were determinant significantly over the academic success (So, 2008). In another study conducted with university students, the correlation between the mastery goal orientation, performance goal orientation, metacognition and academic success was investigated. The results of the study indicated a positive correlation between the mastery goal orientations and academic success. In addition, the results of the study indicated a positive correlation between the mastery goal orientation and metacognition and between metacognition and academic success (Coutinho, 2007). Similarly, as a result of the study conducted by Xiao (2006) investigating the university students' perceptions for their own goal orientations and self sufficiencies, and the correlations between the use of self-regulation strategy and foreign language learning success, the students having mastery goal orientations had significantly higher points than the students having performance goal orientation when graded in terms of the self-regulation strategy usage, but there was no significant difference as regards to the academic success (Xiao, 2006). In parallel to these results, in this study conducted with the doctorate students of Health Sciences Institute of Marmara University, the students using mastery goal orientations and metacognitive learning strategies at high level have better overall performance evaluation levels and the analysis carried out with usage of metacognitive learning strategies reveal significant difference between the groups. In the study conducted by Reed

(2007), the goal orientations and academic successes of students were compared. The assistant physicians' academic alienation and performance goal orientation scores were statistically correlated with the semester marks, and their academic alienation scores were determinant in their high-risk academic performances. On the other hand, in medical students, the mastery goal orientation scores were statistically correlated with the semester marks, but their motivational orientations were not determinants over the high-risk performance. External control scores were determinants over high-risk performances of all students at the end of semester (Reed, 2007). As can be recalled, in the present study, the only significant difference in the correlation between the motivational orientations and academic success turned out to exist only in metacognitive learning strategies, and findings revealed especially that the students who use metacognitive learning strategies at higher level had better overall performance evaluations. As supportive of these results, the correlations among the clinical experiences, studying habits and final exam successes of students applying to the Medical Faculty were investigated to find out that there was a negative correlation between the superficial learning and exam performance and a positive and significant correlation between the in-depth and strategic learning and exam performance (McManus, Richards, Winder, & Sproston, 1998).

Although there are studies in the literature investigating the correlation between metacognitive and motivational regulations and academic success, we did not come across any study inspecting the correlations between the metacognitive adaptation exhibited in difficult situations and academic success. Consequently, the findings addressed in this study are important in that they will contribute to the initiation of new studies to be conducted on this subject matter. There are a great number of studies in the literature investigating the correlation between the metacognitive regulations and academic success. In a study conducted with 810 pre-clinical medical students, differences were ascertained between the metacognitive points of students depending on their current education term and academic success (Turan & Demirel, 2010). The study revealed that the high performing students had the highest points in metacognition (Turan & Demirel, 2010). In a study conducted by Glpınar (2007) with 333 medical students who were in pre-clinic period, for the purposes of determining the correlation between the students' hemispheric tendencies and learning strategies and investigating the effects of hemispheric tendencies and learning strategies on the academic success of students at different learning environments, significant differences were found between the academic success of students with different



hemispheric tendencies and their cognitive processing, metacognitive regulation strategies Gülpınar (2007). In another study (Sperling et al., 2004), the correlations between metacognition, metacognitive strategies, motivation and success were examined and a significant correlation was found between the total score of metacognition scale and learning strategies survey scores, and between the metacognition and motivation. While no strong correlation was found between the metacognition scale and academic success; also the study demonstrated a negative correlation between the mathematical scores and metacognition (Sperling et al., 2004).

Limitations of the Study

Even though the performances during the lecture and dissertation stages were evaluated by two standard forms, only few students were evaluated as “borderline” in the evaluations made by the trainers and the thesis advisors. The evaluations vary between “good” and “very good”. As the data are not normally distributed, the data were re-organized in categories of 2 or 3, and the analyses were conducted within this framework.

Conclusions

In conclusion, considering the overall performance evaluations, motivational orientations, and positive metacognition, positive meta-emotions levels of doctorate students, it was observed that the ratio of those whose overall performance evaluation levels are graded as “good” or “very good” is higher among students who use metacognitive learning strategies at high level and the students having high level of self-confidence for establishing a hierarchy of flexible and feasible goals. These results related to the motivational orientations, metacognitive adaptations and academic successes of doctorate students provide significant contributions to the literature. Especially due to the limited number of studies on metacognitive adaptation exhibited under difficult conditions, it is important that this study paves the way for new studies on the subject matter and the obtained results would be reevaluated along the results of new studies.

In order for the results reached with this study to be reevaluated and retested, similar studies need to be conducted by various faculties that provide education on health at bachelor’s and master’s degrees as well as with the master’s degree and PhD students of institutes that provide education on areas other than health. This issue also should be expanded and deepened by means of studies that investigate how the motivational orientations and metacognitive adaptations of graduate level students change from the first year they start their education to the year they graduate. An important factor that limits the

researches to investigate the academic successes in general is that the high-level cognitive and metacognitive skills, such as critical thinking, problem solving, planning, organizing, re-organizing, and evaluating, are evaluated in a limited way in determining the academic success levels of students. Therefore, just as in this study, it is important to conduct many new researches in which performance-oriented evaluation methods and tools are used with regards to determining the academic success, and when graduate-level education is considered, this need is obviously much more clear.

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