

Developing the Scale of Factors Increasing Study Motivation

*Ali ERYILMAZ**
Maarif MAMMADOV

Eskişehir Osmangazi Üniversitesi
Eğitim Fakültesi Psikolojik Danışmanlık ve Rehberlik ABD
Eskişehir, Türkiye

* erali76@hotmail.com

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Abstract

The purposes of this study is to develop a scale of factors that increase high school students' motivation for studying, and investigate this scale's psychometric properties. 234 high school students took part in the study (119 females [50.9%] and 115 males [49.1%]). In order to evaluate validity of the developed scale, the Life Satisfaction Scale was used. The data were evaluated using statistical techniques such as exploratory and confirmatory factor analysis, and validity analysis. In the study, a four-dimensional scale containing dimensions such as "lessons to be studied is suitable for the students' interests and skills", "being in a positive working environment", "satisfaction of expectations from the teacher" and "being in a positive physical and emotional state" was developed. The scale was named "Motivational factors that increase studying." The scale was found to be reliable and valid. Further studies may be conducted on the scale in the future.

Key words: Adolescents, study motivation, increasing, scale

INTRODUCTION

There are many factors in the field of education that affect students' learning and academic success. One of these factors is motivation (Dweck, 1986). Motivation is defined as factors that affect the intensity, direction, strength and frequency of behavior (Reeve, 2004). In the literature, the subject of motivation in education is evaluated in terms of academic motivation (Berliner, 2001; Bozanoğlu, 2004; Deci & Ryan, 1985; Karagüven, 2012; Ryan & Deci, 2000) and motivation to learn (Brophy, 1999; Pintrich, 2003). It can be seen that studies in this field are conducted mostly over academic motivation scales (Cokley, 2000; Vallerand, Blais, BriBre, & Pelletier, 1989) and on self-determination theory (Berliner, 2001; Deci & Ryan, 1985; Ryan & Deci, 2000). Another subject related to academic motivation is being motivated to learn.

The subject of motivation to learn is mostly seen as a part of self-regulation (Stipek, 1988). Learning by self-regulation includes the person setting a goal, considering and regulating him or herself, controlling their cognitive processes and behaviors (Pintrich, & De Groot, 1990; Pintrich,

2000). Another issue related to both academic motivation and motivation to learn is the students' studies. The literature investigates studying rather in scope of learning attitudes and study strategies. For instance, studying students are categorized in two types as intense and superficial (Biggs, 1987). Students, while studying, use various strategies such as looking for clues, competing, managing time and following the study process (Case & Gunstone, 2003; Scheja 2006; Wilding & Andrews, 2006).

Motivation for studying is a subject that has not been worked on much in the international literature. In the literature in Turkish, Eryılmaz and Ercan (2014) developed a three dimensional motivation to study scale containing being amotivated to study, extrinsic motivation and intrinsic motivation, based on self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000). Studies can be found in the literature on motivation, focusing on individuals being amotivated, extrinsic and intrinsic motivation (Brophy, 1999; Carpenter, Pashler, & Vul, 2006; Pintrich, 2003; Pintrich, 2001; Ryan & Deci, 2000). On the other hand, it might be seen that such studies focusing on individuals being amotivated, the factors that increase or decrease their extrinsic and intrinsic motivation have not been conducted in terms of motivation to study. However, motivational states and the factors that increase and decrease these states are different things (Figure 1). Scale development studies especially on this subject are rare (Eryılmaz & Ercan, 2014).

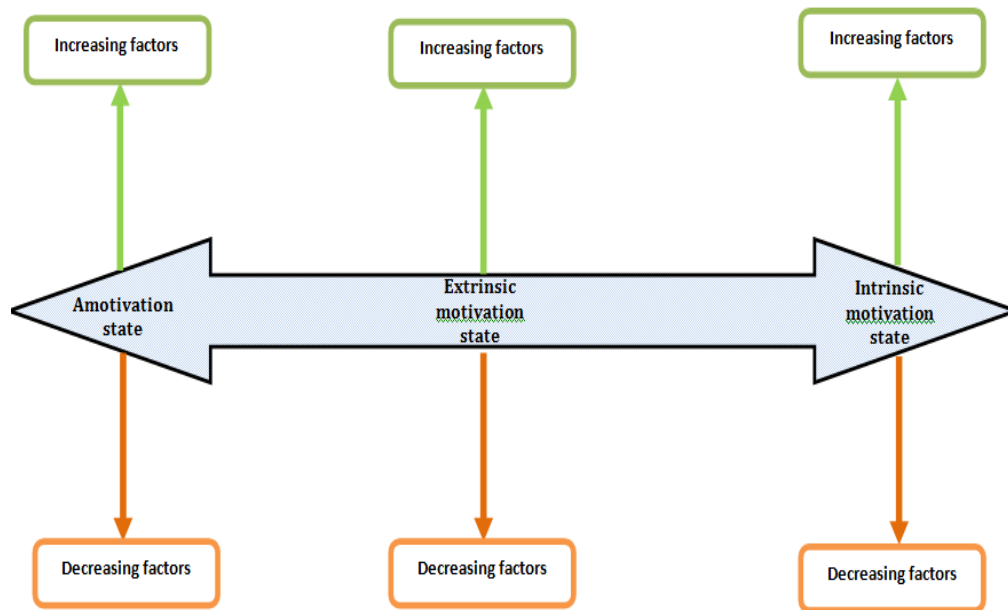


Figure 1. Motivational states

The subject of motivation is highly important in education. Motivation to study is also evaluated in scope of motivation in education (Pintrich, & Schunk, 2002). It has found that many students cannot get motivated to study from time to time (Brophy, 2008; Lepper, Corpus & Iyengar, 2005). Yet increased motivation levels of students create very positive results such as increased academic success and psychological well-being (Froiland, 2011; Gottfried, 1990). In

order to reach the mentioned results, studying development of a scale about factors that increase the motivation to study may benefit the literature. Consequently, the purpose of this study is to develop a scale of factors increasing study motivation in high school students and investigates the scale's psychometric properties.

METHOD

Research Design

The study was conducted with a cross-sectional research design. The data were evaluated using statistical techniques such as exploratory and confirmatory factor analysis, reliability and validity analysis (Fraenkel & Wallen, 1993). The study was conducted on high school students. Data were collected based on voluntary contribution and in a group. Ethical concerns such as voluntary contribution and privacy of personal information were followed during the study.

Research group

The data in this study were collected on students from a high school and a vocational high school. In this study, purposive sampling method was implemented. One for each class (9th, 10th and 11th) were selected from both schools. The high schools providing the data reside in a city in Ankara. 234 high school students took part in the study. 199 of those students (50.9%) were female and 115 of them (49.1%) were male students. The number of students studying at the high school is 119 (50.9%), while the number of vocational high school students is 115 (49.1%). The age interval of the participating students is 14-18 (mean = 16.15; SD = 1.01). Distribution of students by age is like the following: 61 students aged 14 (26%), 80 students aged 15 (34.2%), 56 students aged 16 (24%), 20 students aged 17 (8.5%), and 17 students aged 18 (7.3%).

Instrument

In order to evaluate the validity of the developed scale, the Life Satisfaction Scale was used. Life satisfaction is related to various psychological factors. There are many studies using life satisfaction in an academic context (Çivitçi, 2007; Eryılmaz ve Aypay, 2011; Ünal, 2013). Complying with the information in the literature, it was found to be suitable to use the mentioned scale. The psychometric properties of the scale are provided below.

The Life Satisfaction Scale: This scale was developed by Diener, Emmons, Larsen and Griffin (1985). The scale measuring the satisfaction taken from life is applicable for all age groups. The scale was adapted to Turkish by Köker (1991). It is a self-assessment scale consisting of statements such as "My life is close to my ideals in many of its aspects", "My living conditions are very good", "I am satisfied with my life", "I have acquired what I wanted so far", and "I would change almost nothing if I were born again". All statements require responses based on a 7 point Likert scale (1: not applicable at all – 7: very applicable).

Preparation of the items of the scale

In the preparation of the items to be included in the developed scale, firstly the relevant literature was reviewed (Biggs, 1987; Case & Gunstone, 2003; Deci & Ryan, 1985; Eryılmaz & Ercan, 2014; Ryan & Deci, 2000; Scheja 2006; Wilding & Andrews, 2006). As a second way to develop scale items, qualitative meetings were held with 30 high school students (13 males, 17 females). In the meeting, students were asked about factors that increase their motivation to

study. The responses from the meeting were content-analyzed based on units of sentences. As a results of the analysis, factors such as that the lessons to be studied is suitable for the students' interests and skills, being in a suitable studying environment, teacher of the class is able to satisfy students' expectations, and students are in a positive physical and emotional state became prominent categories.

Data collected from students in compliance with the literature were turned into scale items. While scale items were being structured, methods to be considered such as making statements plain and simple and avoiding statements that may mean more than one thing were considered. 20 items in the scale's preliminary form were shown to experts who have PhD in educational psychology and measurement-assessment in terms of their structure, expression and contribution, and then revised accordingly. As a result of revisions, 15 items were agreed upon to remain in the preliminary form of the scale. Students responded to the items in a 4-point scale changing between always (4) and never (1).

FINDINGS

Factor structure of the developed scale

Exploratory Factor Analysis: In order to collect information on the scale's structure validity, the suitability of the data for exploratory factor analysis was evaluated with the Kaiser-Meyer-Olkin (KMO) coefficient and the Bartlett Sphericity test. As a result of the analysis conducted KMO value was 0.84. As a result of the Bartlett Sphericity test, the chi-square test statistic was significant ($\chi^2=1208.36$; $p < .01$). In the light of these data, moving from the assumption that the factors may be correlated, exploratory factor analysis was conducted with the method of orthogonal rotation (Çokluk, Şekercioğlu, Büyüköztürk, 2010). A 4-factor (4-component) scale was developed as a result of the exploratory factor analysis. 2 items that did not comply with the scale's structure and gave weight to more than one factor were removed from the scale. As a result, a structure containing 13 items with eigenvalues higher than 1 and 4 factors emerged.

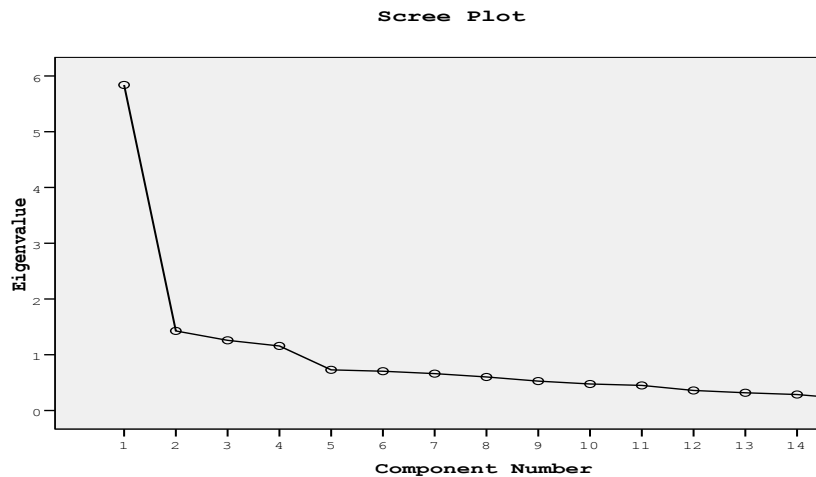


Figure 1. Scree Plot for Initial Analysis

Table 1. The First Results of The Exploratory Factor Analysis

Items	Factors			
	Factor 1	Factor 2	Factor 3	Factor 4
1	.83			
2	.82			
3	.77			
4	.45		.43	
5	.49		.52	
6		.79		
7		.75		
8		.71		
9			.78	
10			.84	
11			.71	
12				.69
13				.81
14				.76
15				.61

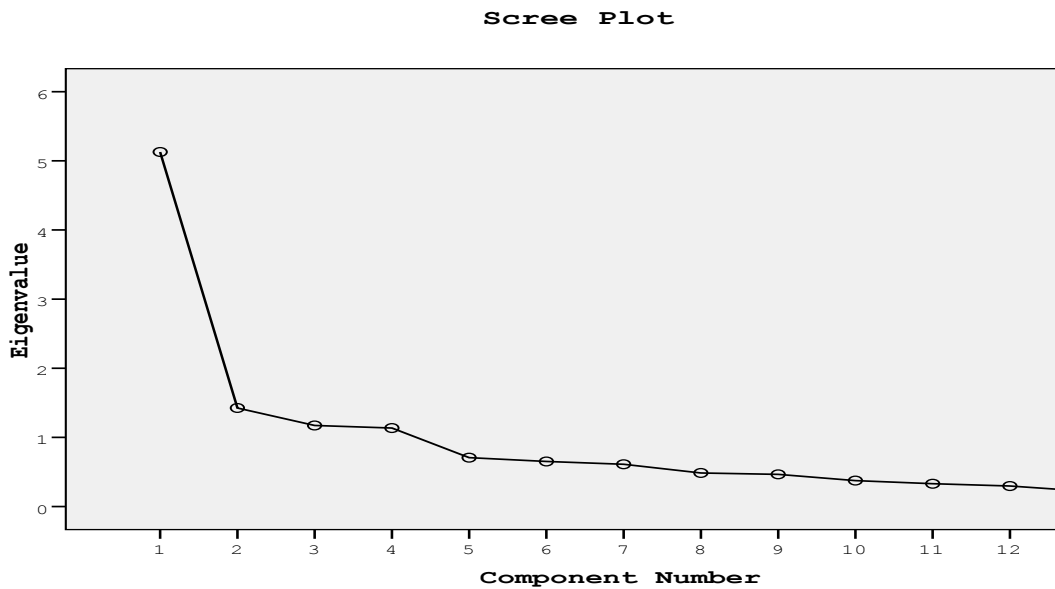


Figure 2. Scree Plot for the Last Analysis

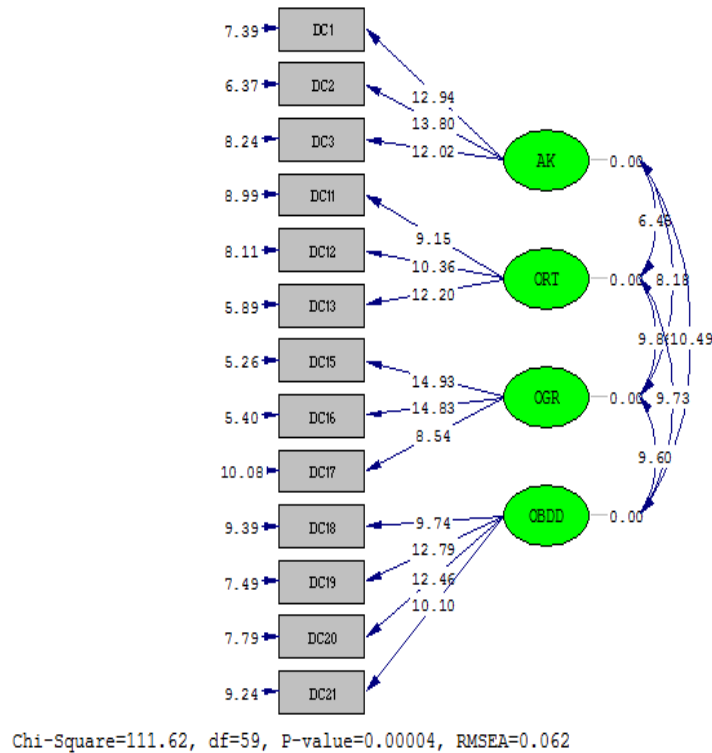
Table 2. The last results of the exploratory factor analysis

Items	Factors			
	Lessons to be studied is suitable for the students' interests and skills	Being in a suitable studying environment	Teacher of the class is able to satisfy students' expectations	Being in a positive physical and emotional state
1	.83			
2	.82			
3	.77			
4		.79		
5		.75		
6		.71		
7			.78	
8			.84	
9			.71	
10				.69
11				.81
12				.76
13				.61

Explained variance; Total: %68.153; Factor 1: %18.527; Factor 2: %17.124; Factor 3: %16.707; Factor 4: %15.796

The first sub-factor (Lessons to be studied is suitable for the students' interests and skills) consists of 3 items. The corresponding eigenvalue is 5.127. Flow sub-factor explains 18.52% of the entire variance by itself. The second sub-factor (being in a positive studying environment) consists of 3 items and it has an eigenvalue of 1.425. This sub-factor explains 17.12% of the entire variance by itself. The third sub-factor (the teacher of the class is able to satisfy students' expectations) consists of 3 items and it has an eigenvalue of 1.172. This sub-factor explains 16.7% of the entire variance by itself. The fourth sub-factor (being in a positive physical and emotional state) consists of 4 items and its eigenvalue is 1.135. The fourth sub-factor by itself explains 15.79% of the entire variance. The four factors together, explain 68.15% of the variance in the scale. Factor weight values of items in the scale change between 0.61 and 0.84.

Confirmatory Factor Analysis: In addition to the findings from the exploratory factor analysis, a confirmatory factor analysis was conducted in order to evaluate the structural validity of the scale. Significance levels of the t values were assessed for the variables observed as a result of the confirmatory factor analysis. As a result of the analysis, the values for all observed variables were significant on a level of 0.01 (Çokluk, Şekercioğlu & Büyüköztürk, 2010).



Note: *AK*= Lessons to be studied is suitable for the students' interests and skills, *ORT*= being in a positive studying environment, *OGR*= the teacher of the class is able to satisfy the students' expectations, *OBDD*= being in a positive physical and emotional state

Figure 3. Results of the Confirmatory Factor Analysis (T-Values)

Other values analyzed as a result of the confirmatory factor analysis are error variances of the variables (Figure 3). None of the items or the implicit variable had a high error variance. Values that need to be analyzed in scope of the finding from the confirmatory factor analysis are adaptive values. Adaptive index was assessed in terms of ' χ^2/sd '. $\chi^2 = 111.62$ and $sd=59$ (Figure 4). The adaptive index was $111.62/59 = 1.89$. As the value is under 3, it is a perfect fit. If we look at other adaptive indices, RMSEA value being 0.062 is a good fit, GFI=0.93 (good fit), AGFI=0.89 (weak fit), RMR=0.049 (perfect fit), NNFI=0.97 (perfect fit), CFI=0.97 (perfect fit) (Çokluk, Şekercioğlu & Büyüköztürk, 2010). The scale developed based on both the exploratory factor analysis and the confirmatory factor analysis was named "the scale of factors increasing study motivation".

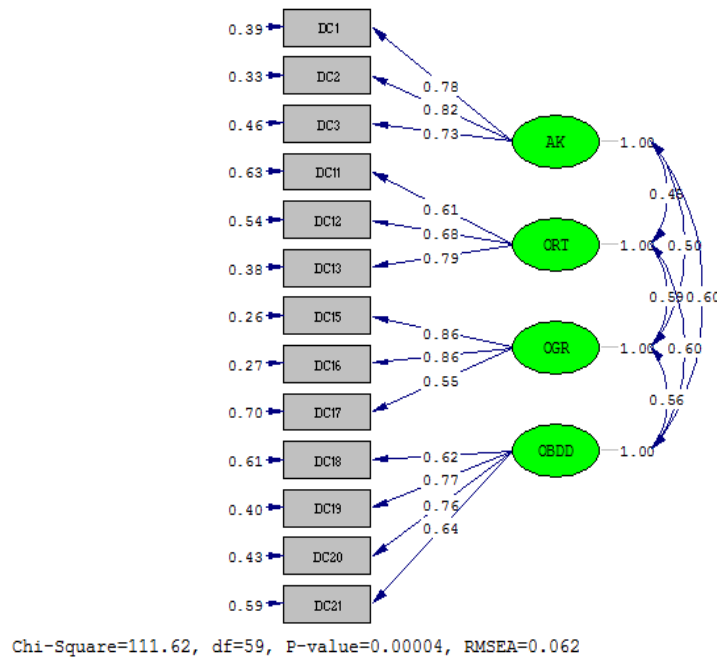


Figure 4. Results of The Confirmatory Factor Analysis (Factor Weight Values and Error Variances)

Note: AK= Lessons to be studied is suitable for the students' interests and skills, ORT= being in a positive studying environment, OGR= the teacher of the class is able to satisfy the students' expectations, OBDD= being in a positive physical and emotional state

Reliability of the Scale of Factors Increasing Study Motivation

The reliability of the scale of factors increasing study motivation was measured with the internal consistency technique of Cronbach's alpha. In terms of the reliability of the scale, Cronbach's alpha values were computed for each sub-factor and for the entire scale. The entire scale had a reliability value of 0.87. The Cronbach's alpha reliability coefficients for the sub-factors were the following; 0.82 for the first, 0.72 for the second, 0.79 for the third, and 0.79 for the fourth sub-factor. Findings about reliability show that the scale has a satisfactory level of reliability (Çokluk, Şekercioğlu & Büyüköztürk, 2010).

Findings Regarding Validity of the Scale Of Factors Increasing Study Motivation

The concurrent validity of the scale of factors increasing study motivation was measured with the Life Satisfaction Scale. To reach the findings about concurrent validity, the data were analyzed with Pearson product-moment correlation coefficient. Results of the analysis were shown in Table 3.

Table 3. Correlation Coefficients

Variables	1	2	3	4	5	6
1. Lessons to be studied is suitable for the students' interests and skills	1					
2. Being in a suitable studying environment	.33**	1				
3. Teacher of the class is able to satisfy students' expectations	.44**	.44**	1			
4. Being in a positive physical and emotional state	.51**	.44**	.50**	1		
5. Life satisfaction	.36**	.15*	.19**	.35**	1	
6. Total point	.74**	.71**	.77**	.83**	.35**	1

**p<.01, *p<.05

Table 3 shows the relationships of scale of factors increasing study motivation and the life satisfaction scale. The scale of factors increasing study motivation shows significant and important relationships with the Life Satisfaction Scale in both overall and sub-factor levels. The overall scale and the sub-factors also had positive and significant relationships.

DISCUSSION

In this study, we developed a scale of factors increasing study motivation, and investigated this scale's psychometric properties. In the study, a four-dimensional scale containing dimensions such as "lesson to be studied is suitable for the students' interests and skills", "being in a positive working environment", "satisfaction of expectations from the teacher" and "being in a positive physical and emotional state" was developed. The scale was named "The scale of factors increasing study motivation."

When motivation is investigated in the field of education, it can be seen that most research is conducted on academic motivation and learning to learn (Pintrich, 2003; Ryan & Deci, 2000). There have also been various scale development studies in this field (Berliner, 2001; Bozanoğlu, 2004; Deci & Ryan, 1985; Karagüven, 2012; Vallerand, Blais, BriBre, & Pelletier, 1989). However, motivational states of individuals and the factors that increase and decrease these states are different things. There are factors that strengthen and weaken this situation (can be seen in figure 3). The number of studies that make these two distinctions is very low in the literature.

Scale studies in the literature about academic motivation are mostly about detecting individuals' motivation states. There are no measurement tools to directly measure factors that increase or decrease these states of the individuals. In addition to all these, the number of studies that are conducted on motivation to study is really low (Eryılmaz & Ercan, 2014). Especially studies that are able to directly measure the factors that affect motivation states (intrinsic, extrinsic, and amotivated) are rare if any. As this study is a study of developing a scale of motivational factors that increase studying, it can be considered to be contributing to the literature.

The first dimension of the scale subject of this study was named lesson to be studied is suitable for the students' interests and skills. In other words, this dimension feels like experiencing flow in the class. In this naming, the content of scale items and the information in the literature were utilized. In this dimension of the scale, there were statements such as "my willingness to study increases as I like the lesson", "my willingness to study increases as I am interested in the subjects to learn". These statements do not reflect boredom or anxiety, but the state of flow. According to Csikszentmihalyi (1975, 1990), flow means individuals prefer an

activity because it makes them happy and they get internally motivated for that activity (Csikszentmihalyi and LeFevre, 1989).

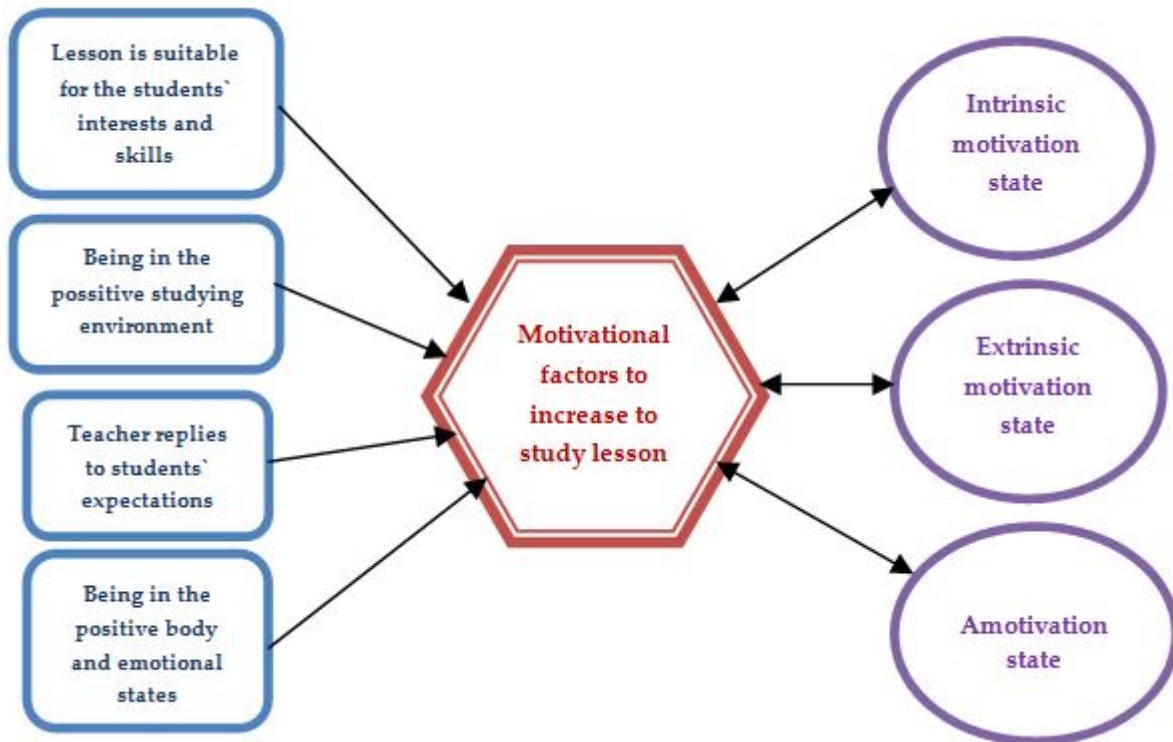


Figure 3. States Of Motivation and the Factors that Increase or Decrease the State of Motivation

In flow experience, the individual puts their entire capacity forward. The amount of work is balanced with the individual's capacity. If the work is higher than the individual's capacity, it causes anxiety. If it is lower, it results in boredom (Csikszentmihalyi and Rathunde, 1993). According to the literature, there is a need for studies that aim to increase students' flow experience in context of education. The studies on this subject, on both national and international level, are seen insufficient (Shernoff, Csikszentmihalyi, Shneider and Shernoff, 2003; Yalçın and Tavşancıl, 2014). Emergence of one of the dimensions of the scale in this study as flow provides an important viewpoint to get rid of the mentioned dearth. This study by showing the reflection of flow experience on studying expands the areas of experiencing flow. Additionally, Eryılmaz (2011), in the scale they developed about being motivated to participate in class, also found a dimension as experiencing flow in the class. The scale dimension found in this study with the same name was considered in terms of being motivated to study. Based on these similarities, it can be said that the concept of flow is important in different academic contexts.

One of the dimensions of the scale developed in the study was named being in a positive physical and emotional state. In the literature, the subject of academic motivation is studied under psychosocial factors such as psychological need satisfaction (Deci & Ryan, 1985), determining goals and competing for goals (Eryılmaz, 2015), self-efficacy (Pintrich, 2000), perceived control (Skinner, 1995) and learned helplessness and attribution (Pintrich & Schunk, 2002). However, human is a bio-psycho social being. In this study, as the statement being in a positive physical

and emotional state refers to bodily, in other words, biological structures, it may be considered complementary to other studies. Similar to the findings of this study, Eryılmaz (2011), in the scale they developed about being motivated to participate in class, found a dimension as being in a positive physical and emotional state in class. The scale dimension found in this study with the same name was considered in terms of being motivated to study. Based on these similarities, it can be said that the concept of being in a positive physical and emotional state is important in different academic contexts.

One of the dimensions of the scale developed in the study was found to be whether the teacher is able to satisfy the expectations of the students. According to the literature, teachers are important actors in students' learning (Eryılmaz, 2013). There are findings that suggest teachers are 25% effective in students' academic success (Eryılmaz, 2014). It seems interesting the students who took part in this study carried the relationships that have with their teachers into the studying environment. The reasons for this relationality dimension may be sought among cultural factors. Societies are classified in various ways such as individualistic and collectivistic societies. Kağıtçıbaşı (2000), indicates that individuals living in Turkey rather have relational-autonomous selfs. One dimension of this relationality may be the relationship established with the teachers. Additionally, Eryılmaz (2013), revealed that expectations from teachers are important in students' participation in class. In this context, while this study is similar to the study mentioned above, it differs from it in the sense that this study is based on being motivated to study.

Another dimension of the scale developed in the study was named being in a positive environment. The learning by self-regulation approach indicates that environment is important in studying. A studying environment that is sufficiently warm, spacious, tidy and silent affects students' learning (Pintrich, & De Groot, 1990; Pintrich, 2000; Pintrich & Schunk, 2002; Stipek, 1988). It may be seen that studies revealing the effects of physical environment on academic motivation are rare. This study, by indicating the importance of the physical environment, can be considered to be contributing the literature.

Consequently, this study was conducted in order to develop a scale on the factors that increase motivation for studying and investigate the developed scale's psychometric properties. According to the findings of the study, it was seen that the developed scale is reliable and valid. Researchers may contribute to the literature by conducting studies on different samples with the scale developed in this study.

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APPENDIX

Developing the Scale of Factors Increasing Study Motivation

Dear participants, there are some phrases/sentences about factors that increase one from studying lessons. Please put a tick in the appropriate box considering your own situation between the LAST WEEK and TODAY.

		NEVER	SELDOM	OFTEN	ALWAYS
1	My desire to study increased because there have been lessons which I like.				
2	My desire to study increased because I have been interested in lessons.				
3	My desire to study increased because lessons have been exiting.				
4	My desire to study increased because there have not being annoyed things in the study environment.				
5	My desire to study increased because the study environment has been suitable to satisfy my needs				
6	My desire to study increased because the study environment has been got enough breathable and lighted				
7	My desire to study increased because my teachers are understanding and gracious				
8	My desire to study increased because my teachers have been lectured well.				
9	My desire to study increased because my teachers have been made me motivated				
10	My desire to study increased because I have been physically comfortable				
11	My desire to study increased because I have been happy.				
12	My desire to study increased because I have been dynamic and pleased				
13	My desire to study increased because I have been psychologically/mentally well				

- 1-3 lessons to be studied is suitable for the students' interests and skills
 4-6 being in a suitable studying environment
 7-9 teacher of the class is able to satisfy students' expectations
 10-13 being in a positive physical and emotional state

EK**Ders Çalışma İsteğini Artıran Faktörler Ölçeği**

Sevgili katılımcılar, bu ölçekte genel olarak herhangi bir derse çalışma isteğinizi artıran faktörlerle ilgili ifadeler yer almaktadır. Lütfen her ifadeyi GEÇEN HAFTADAN BUGÜNE ne kadar yoğun yaşadığınızı ilgili yeri (X) işareti koyarak değerlendiriniz. Her ifadeyi bir kez değerlendirmelisiniz. Değerlendirmelerinizde hiç boş bırakmayınız.

		HİÇ	ÇOK AZ	FAZLA	ÇOK FAZLA
1	Dersleri sevdiğim için ders çalışma isteğim artıyor.				
2	Öğrenilecek konular ilgimi çektiği için ders çalışma isteğim artıyor.				
3	Dersler beni heyecanlandırdığı için ders çalışma isteğim artıyor.				
4	Çalışma ortamında beni rahatsız eden ve öğrenmemi engelleyen sebepler olmadığında ders çalışma isteğim artıyor.				
5	Çalışma ortamı ihtiyaçlarımı karşılamağa uygun olduğunda ders çalışma isteğim artıyor.				
6	Çalışma ortamı yeterince havadar ve aydınlık olduğunda ders çalışma isteğim artıyor.				
7	Öğretmenlerim anlayışlı ve güleryüzlü oldukları için ders çalışma isteğim artıyor.				
8	Öğretmenlerim güzel bir şekilde ders anlattıkları için ders çalışma isteğim artıyor.				
9	Öğretmenlerim beni motive ettikleri için ders çalışma isteğim artıyor.				
10	Kendimi fiziksel açıdan iyi hissettiğim için ders çalışma isteğim artıyor.				
11	Mutlu olduğum için ders çalışma isteğim artıyor.				
12	Dinamik ve keyifli olduğum için ders çalışma isteğim artıyor.				
13	Ruhsal açıdan kendimi iyi hissettiğim için ders çalışma isteğim artıyor.				

1-3 dersin öğrencinin ilgi ve yeteneğine uygun olması

4-6, uygun çalışma ortamında bulunmak

7-9 öğretmenin öğrencinin beklentilerine yanıt vermesi

10-13 olumlu beden ve duygu durumunda olmak