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The Relations Among University Students' Academic Self-efficacy, Academic Motivation, and Self-control and Self-management Levels

Soner ARIK*

School of Foreign Languages, Nigde Ömer Halisdemir University, Nigde, Turkey

Corresponding author: Soner ARIK, E-mail: sarik38sarik@gmail.com

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ABSTRACT

Self-control and self-management, academic motivation and academic self-efficacy are among several variables that affect academic achievement. Although they are widely studied in literature, there is lack of study that deals with them together in one study. This study investigates the relations between self-control and self-management, academic motivation and academic self-efficacy levels of university students. A group of 588 students at a state university in Turkey participated in the study. The data were collected through 'Academic Motivation Scale', 'Academic Self-Efficacy Scale', 'Self-Control and Self-Management Scale' and a Personal Profile Form that was prepared by the researcher. In line with the purpose of the research, a structural equation model regarding the predictive power of Academic Self-Efficacy level on Academic Motivation and Self-Control and Self-Management levels, and the predictive power of Academic Motivation level on Self-Control and Self-Management level was set. According to the results of the research, it is clear that academic self-efficacy is a significant predictor of both academic motivation and self-control and self-management of university students but academic motivation does not predict self-control and self-management. The research results were discussed within the literature and several recommendations were made in accordance with them.

Key words: Self-control and Self-management, Academic Motivation, Academic Self-efficacy, Academic Achievement

INTRODUCTION

Academic achievement, a concept including cognitive, psycho-motor and affective achievements students are supposed to acquire, is frequently mentioned in literature. It is affected from such variables as personality, level of intelligence, motivation, knowledge, skills, level of anxiety, self-control (SC), academic self-efficacy (ASE) and self-esteem. This research deals with motivation, SC and ASE as easier variables to intervene in considering the time and effort spent.

There exist several studies which reveal that academic motivation (ACM) (Alderman, 2004; Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Amrai, Motlagh, Zalani & Parhon, 2011; Guay Ratelle, Roy & Litalien, 2010; Hassankhani, Aghdam, Rahmani & Mohammadpoorfard, 2015; Rakes & Dunn, 2010; Turner, Chandler & Heffer, 2009; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009), ASE (Akbay & Gizir, 2010; Cleary & Kitsantas, 2017; Fife, Bond & Byars-Winston, 2011; Khalaila, 2015; Turner, Chandler, & Heffer 2009; Zimmerman & Kitsantas, 2005) and self-control and self-management (S-CM) (Carmeli, Meitar & Weisberg, 2006; Covarrubias & Stone, 2015; Duckworth & Gross, 2014; Duckworth & Seligman, 2005; Ercoşkun, 2016; Gawrilow, Fäsche, Guderjahn, Gunzenhauser, Merkt & von Suchodoletz, 2014; Li-Grining, Votruba-Drzal, Maldonado-Carreño & Haas, 2010; Özsoy, 2012; Tabak, Sığrı, & Türköz, 2013; Tangney, Baumeister & Boone, 2004; Todd, Horner, & Sugai, 1999; Wiese, Tay, Duckworth, D'Mello, Kuykendall, Hofmann & Vohs, 2017) have an effect on academic achievement. These variables which are considered vital in improving academic achievement and whose predictive powers on each other are examined in this research are mentioned in the theoretical rationale section. These studies mostly focus on the effect of these variables on academic achievement and do not question the predictive or mediator role of them among themselves. Therefore, considering the lack of studies in literature that deals with these three variable in one single study, this study is thought to be important in that it aims to examine the mediator and predictive role of academic self-efficacy levels of university students on their academic motivation levels and self-control and self-management levels

THEORETICAL RATIONALE

S-CM

The term SC, or self-management (SM), is the ability to sacrifice primary reactions for higher-value targets (Duckworth

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& Seligman, 2006) and it is related to cognitive control (Inzlicht, Schmeichel & Macrae, 2014). In this context, SC refers to the dilemma of being undecided between a smaller, concrete and closer incentive and a bigger, abstract and further one (Fujita, 2008). SC represents the processes enabling individuals to suppress their incentives, perform challenging tasks and stay focused (Inzlicht, Legault & Teper, 2014).

In other words, SC is a skill that helps individuals focus on fulfilling a duty (Diamond, 2013) and behave in accordance with global objectives and values (Fujita, 2011) although they have the desire to do some other stuff. SC is frequently referred to as self-discipline, self-regulation, delay of pleasure, willpower, effortful control, ego strength, etc. (Duckworth, 2011). Moffitt, Arseneault, Belsky, Dickson, Hancox, Harrington and Sears (2011) explained SC using responsibility and diligence while Roberts, Chernyshenko, Stark and Goldberg (2005) referred to it as regularity. Gawrilow et al. (2014) defines SC with self-regulation as well as willpower. In organizational, health and clinical psychology, SC is addressed under three topics; namely self-leadership, self-regulation and awareness or mindfulness (Yaka, 2011).

SC enables various useful features possible (Baumeister & Exline, 1999) and it is among the basic concerns of schools (Diamond & Lee, 2011) because even those with high cognitive skills cannot be successful at school unless they use these skills (Achtziger & Bayer, 2018). For instance, even very skilful students cannot complete their duties if they submit any extrinsic suggestive incentive. The skill that is required for individuals to perform their duties and responsibilities in the event of such incentives is SC (Achtziger & Bayer, 2018) as it includes strategies that help individuals resist such incentives (Ercoşkun, 2016). Individuals with high levels of SC can delay pleasures and behave carefully, rationally and patiently while those who have low SC tend to behave impulsively and become distracted easily (Roberts et al., 2005).

ACM

Several behaviours of individuals are affected by means of intrinsic and extrinsic factors, which are represented by motivation as an intrinsic condition that affects how and how often an individual's behaviour occurs (Slavin, 2006). Motivation is also defined as a cognitive power that serves individuals to attain their goals (Sternberg & Williams, 2009). It is the interest and will to perform an activity focusing on the possible outcomes of it (Deci & Ryan, 2000). Considering the intentional behavioural changes in education, the control and effective use of the factors that enable an individual to continue any achieved behaviour become important. While some students are willing in activities such as active participation, attendance to lesson and problem solving, others seem to avoid such activities in educational environments. One of the most important factors causing this gap among students is motivation because a target-driven behaviour is started and pursued by motivation (Pintrich & Schunk, 2002). In this context, ACM is regarded as a vital factor that gives the efficiency of learning-teaching environments prominence (Filiz & Demirhan, 2018).

ACM also explains students' participation in learning activities. Motivated students are identified with lower procrastination and higher determination. They aim at learning opportunities and do not quit even when they encounter difficulties (Artino Jr & Stephens, 2009). ACM is described as an incentive affecting students' learning, performances and objectives (Ormond 2006). It is defined as aiming at learning activities and participating in these activities (Artino Jr & Stephens, 2009) and regarded as the supporter to academic achievement (Alexander, 2006). Lin (2012) defines ACM as a perception and discipline that affects individuals' behaviours positively or negatively.

Intrinsic and extrinsic motivations underlie ACM (Areepattamannil, Freeman & Klinger, 2011). Intrinsic motivation is classified as the desires to know, achieve and arouse. These three desires derive from the will to do an activity for the satisfaction that is felt while learning or searching for new information, succeeding or creating something new, and cognitive and physical pleasure respectively (Vallerand, 1997). While intrinsic motivation is the will to participate in academic activities as a result of interest, extrinsic motivation represents the desire to conduct academic activities for a reward or esteem (McGeown, Putwain, Simpson, Boffey, Markham & Vince, 2014).

ASEF

Bandura (1997) defined self-efficacy (SEF) as the confidence in solving a problem or fulfilling a duty and claimed that SEF beliefs of individuals are the basic determinants of their decisions, behaviours, willingness and determination. SEF belief is closely and directly related to individuals' perceptions about their performances in certain duties. In this context, achieving a duty improves students' confidence in related skills, increasing their levels of ASEF (Hutchison, Follman, Sumpter & Bodner, 2006).

ASEF includes judgments and beliefs about the abilities and efficacies to fulfil duties and responsibilities in certain academic issues (Dorman, Fisher & Waldrip, 2006; Fife, Bond & Byars-Winston, 2011). Quimby and O'Brien (2004) define ASEF as student SEF and describe it as the belief in achieving the duties related to students' roles. They claim that ASEF is affected from the perceived educational obstacles and social supports. Similarly, Wettersten, Guilmino, Herrick, Hunter, Kim, Jagow and McCormick (2005) and Lent, Brown, Schmidt, Brenner, Lyons and Treistman (2003) also state that there is an inverse proportion between perceived educational obstacle and ASEF. Wright, Perrone-McGovern, Boo and White (2014) have found in their structural equation model that perceived academic obstacles and supports are the mediators of the relation between students' commitment to school and their academic self-efficacies.

As a result, it can be claimed that students with higher ASEF perception study harder and struggle against difficulties longer, thus becoming more successful (Schunk & Pajares, 2002), which clearly proves the importance of ASEF perception.

The Correlation among S-CM, ACM and ASEF

In literature, there are various researches that investigate the effects of S-CM, ACM and ASEF on both academic achievement and each other. Mentioning the correlations among these three variables briefly would serve a better understanding of the issue.

In terms of motivation, SC represents the dilemma of being undecided between a smaller, concrete and closer incentive and a rewarding, abstract and further one (Fujita, 2008). At this stage, SC becomes the part of the activity and enables individuals give up smaller, concrete and closer motives for the sake of greater, abstract and further ones (Fujita, 2011). Lavasani, Mirhosseini, Hejazi and Davoodi (2011) have revealed that S-CM skills, which are referred to as self-regulation skills by Gawrilow et al. (2014), affect students' ACMs and SEF perceptions considerably and positively. Balkis (2011), who has found that individuals who perform procrastination behaviours have low SEF perception levels, claims that improving SC skills will increase the levels of SEF perception.

As for the relation between motivation and SC, setting objectives in line with personal values can contribute to higher SEF levels. Autonomy theory claims that the effect of motivation on behaviours is not only related to the amount but also to the quality of it (Deci & Ryan, 2000). It is easier to control any behaviour if the objectives are intrinsically motivating, or personally meaningful (Hockey & Earle, 2006). Poon, Briscoe, Abdul-Ghani and Jones (2015) state that motivation and self-discipline are of great importance for individuals to achieve their objectives and plans in terms of career management. Wilson and Lizzio (2008) assert that motivation and ASEF are among the factors that affect university students' S-CM skills in academic settings. Students' positive ACMs are claimed to increase their ASEF levels, thus improving their academic achievement levels (Hassankhani, Aghdam, Rahmani & Mohammadpoorfard, 2015). Cerino (2014) indicated that both ACM and perceived ASEF have a considerable effect on academic achievement.

ASEF is referred to as student SEF and defined as students' beliefs in achieving a task successfully (Hsieh, Sullivan & Guerra, 2007). The researchers revealed that students with high levels of SEF have ACM for developing and improving their skills and abilities while they participate in academic activities. Titrek, Çetin, Kaymak and Kaşıkçı (2018) found that there exists a significant and proportional correlation between ASEF and ACM, which is similar to the results of the study by Kilicoglu (2018). According to Zimmerman (2000), student with self-regulation skills also have high levels of SEF and set themselves various motivating objectives. Besides, they are motivated to continue academic activities as long as they are able to manage self-observation, self-evaluation and self-reaction processes. It was asserted by Pajares (1996) that, apart from being related to other self-beliefs, SEF is also a strong means of motivation. ASEF constitutes the basis of ACM and achievement (Pajares, 2002) and it has a mediator role between ACM and learning strategies (Yusuf, 2011). Bandura (2001) and Aydın (2015) claim that high perceived ASEF affects ACM considerably and positively. Similarly, Dogan (2015) and Bedel (2015) state that high perceived ASEF predicts ACM significantly and positively. Khalaila (2015) revealed that perceiving oneself academically self-efficacious improves an individual's intrinsic motivation. Alivernini and Lucidi (2011) also found that ASEF affects not only academic performances but also intrinsic ACMs of students. De Feyter, Caers, Vigna and Berings (2012) investigated the relations between the ASEF and ACM levels of emotionally neurotic and stable students in their study with 375 university students. The results of the study showed that while there is no relation between the ASEF and ACM levels of emotionally neurotic students, emotionally stable students with high levels of SEF are over-confident and have low ACM.

There are several studies that mention the relations of S-CM, ACM and ASEF with both each other and other factors. However, no research is found that deals with these three factors altogether in one single study. In this sense, this research is considered to be significant in that it will shed light on the correlations among these three factors that affect academic achievement. Finding out the factor that has the most effective mediator or predictor role, the research is expected to give clues to academicians and school managers about where to start in the process of improving their students' academic achievement levels. It is also considered to contribute to literature in that it deals with widely but separately studied issues together in one single research that are thought to affect academic achievement and that are thought to be modifiable.

Objectives and Research Questions

The purpose of this research is to investigate the relation among S-CM, ACM and ASEF levels of university students. In this sense, the research questions are as following;

1. Are the perceived ASEF of university students a significant predictor of their ACM levels?
2. Are the perceived ASEF of university students a significant predictor of their S-CM levels?
3. Are the perceived ACM levels of university students a significant predictor of their S-CM levels?

Method

This study is of descriptive survey method, which is a research approach that aims to describe a past or present condition as it is. In this method, the case, individual or object that is subject to the research is described as it is and within its own conditions with an effort to change or affect them (Karasar, 2006). Structural equation model is used to test the predictor role of ASEF on ACM and S-CM levels of university students.

Participants

The study group consists of 588 students at a state university in the Central Anatolia Region in Turkey. Data about the participants are shown in Table 1.

According to Hair et al. (1998), regarding the adequate number of sampling, every single parameter in any scale

Table 1. Data about the participants

		School			Total
		Faculty	College	Vocational school	
Female	N	110	84	142	336
	%	18.7	14.3	24.1	57.1
Male	N	186	36	30	252
	%	31.6	6.1	5.1	42.9
Total	N	296	120	172	588
	%	50.3	20.4	29.3	100.0

must be rated by at least 10 participants so that the data will show a normal distribution curve. However, Hoyle (1995) states that the number of sampling must be at least 250 for confirmatory factor analysis. Şimşek (2007) asserts that number of sampling in structural equation model must be minimum k (k-1)/2 (k=the number of variables). In this research, the data show a normal distribution curve as they were collected from 588 participants.

Data Collection Tools

ACM Scale

The ACM Scale was developed by Vallerand, Pelletier, Blais, Brière, Senécal and Vallières (1992) and adapted into Turkish by Karagüven (2012). The scale consists of 28 items and 7 sub-scales. In this 5-likert type scale, the items are scored as 'Does not suit at all-1', 'Suit a little-2', 'Moderately suit-3', 'Quite suit-4' and 'Completely suit-5'. Negative items are scored reversely.

ASEF Scale

The ASEF Scale, developed by Trevathan (2002), was adapted into Turkish by Ekici (2012). The scale consists of 33 items and 3 sub-scales. The scale is 5-likert type and the items are scored as 'Quite rarely-1', 'Rarely-2', 'Sometimes-3', 'Often-4' and 'Quite often-5'. The scale includes no negative items.

S-CM Scale

The S-CM Scale, developed by Mezo (2009) was adapted into Turkish by Ercoşkun (2016). The scale is 6-likert type and it consists of 16 items and 3 sub-scales. The positive items are scored as 'Doesn't explain me at all-0', 'Doesn't explain me mostly-1', 'Doesn't explain me much-2', 'Somewhat explains me-3', 'Mostly explains me-4' and 'Completely explains me-5' while the negative ones are scored reversely.

Exploratory Factor Analysis and Reliability Test Results of the S-CM, ACM and ASEF Scales

KMO and Bartlett's tests was conducted to see whether the three scales were appropriate for exploratory factor analysis. In this context, KMO test result must be.60 and over, and Bartlett's test results must be statistically significant (Büyüköztürk, 2010). KMO test results showed that KMO values of ACM scale, S-CM scale and ASEF scale were.814.,869 and.801 respectively. Bartlett's test results were found significant ($P<0.01$) for all the scales. In the exploratory factor analysis, the limit value for the load values of the items within their factors was.40. Maximum likelihood analysis method and Varimax technique were used to find the items with the highest relation to the factors and to interpret the factor easier.

RESULTS

In this section, the results obtained from the data through several statistical tests are given in tables. Table 2 presents the factor analysis results for the ACM Scale.

As a result of the factor analysis for the ACM Scale, 8 items that did not contribute to any factor or whose factor load value was below.40 were excluded from the scale, and six factors were found in the scale. It was seen that these six factors explain 11.74%, 11.36%, 10.61%, 10.21%, 9.74% and 9.56% of the total variance of the scale respectively. The factor dimensions of the scale in total explain 63.22% of the scale.

The factor analysis results for the ASEF Scale are given in Table 3.

As a result of the factor analysis for the ASEF Scale, 21 items that did not take part in any factor or whose factor load value was below.40 were excluded from the scale, and four factors were found in the scale. These four factors explain 16.64%, 15.02%, 14.96% and 13.90% of the total variance of the scale respectively. The factor dimensions of the scale in total explain 60.52% of the scale.

Table 4 shows the results of the factor analysis for the S-CM Scale.

As a result of the factor analysis for the S-CM Scale, 5 items that did not take part in any factor or whose factor load value was below.40 were excluded from the scale, and two factors were found in the scale. These factors explain 57.03% and 38.30% of the total variance of the scale respectively. The factor dimensions of the scale in total explain 95.33% of the scale.

Cronbach Alpha coefficients were calculated for the findings about the reliability of the scales. Cronbach Alpha value for the ACM Scale in total was found.861 while the values of the six factors were calculated as.734.,758.,699.,734.,698 and.676 respectively. As for the ASEF Scale, Cronbach Alpha value for the whole scale was found.806 while the values of the four factors in the scale were calculated as.663.,649.,652 and.688 respectively. Regarding the S-CM Scale, Cronbach Alpha value for the whole scale was found.975 and the values of the two factors in the scale were calculated as.990 and.988 respectively. Tezbaşaran (1997) states that the sufficient reliability coefficient of a scale must be as close to 1 as possible. Cronbach Alpha values for the S-CM Scale show that the scale is highly reliable. Considering the exploratory factor analysis results and internal consistency coefficients of the ACM, ASEF, and S-CM Scales, each scale is accepted as valid and reliable.

Table 2. Factor analysis results for acm scale

Item no	Factor covariance	Factor-1 loading	Factor loadings after rotation						Corrected item-total correlation	Cronbach alpha
			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6		
ACM1	0.593							0.740	0.318	0.676
ACM2	0.629	0.468						0.724	0.411	
ACM3	0.673	0.446						0.784	0.391	
ACM6	0.566	0.528			0.659				0.459	0.699
ACM7	0.586	0.488			0.656				0.418	
ACM8	0.663	0.467			0.755				0.398	
ACM9	0.537	0.559			0.621				0.488	
ACM16	0.568	0.563				0.633			0.480	0.734
ACM17	0.749	0.542				0.820			0.462	
ACM18	0.727	0.539				0.768			0.457	
ACM19	0.690	0.573		0.740					0.492	0.758
ACM20	0.682	0.581		0.745					0.500	
ACM21	0.687	0.556		0.731					0.478	
ACM22	0.692	0.558	0.673						0.481	0.734
ACM23	0.621	0.579	0.724						0.495	
ACM24	0.658	0.501	0.776						0.423	
ACM25	0.424	0.491	0.550						0.417	
ACM26	0.634	0.546					0.719		0.474	0.698
ACM27	0.750	0.556					0.821		0.478	
ACM28	0.516	0.569					0.623		0.493	

Cronbach alpha value for the whole scale is 0.861

Table 3. Factor analysis results for ASEF Scale

Item no	Factor covariance	Factor-1 loading	Factor loadings after rotation				Corrected item-total correlation	Cronbach alpha
			Factor 1	Factor 2	Factor-3	Factor 4		
ASEF2	0.618	0.517	0.729				0.415	0.663
ASEF3	0.602	0.552	0.721				0.440	
ASEF5	0.525	0.591	0.675				0.479	
ASEF6	0.387	0.575	0.516				0.462	
ASEF1	0.500	0.486			0.597		0.382	0.652
ASEF9	0.688	0.636			0.760		0.510	
ASEF10	0.733	0.622			0.795		0.497	
ASEF13	0.700	0.604				0.777	0.477	0.688
ASEF14	0.710	0.585				0.797	0.460	
ASEF23	0.476	0.468		0.654			0.371	0.649
ASEF30	0.677	0.510		0.809			0.407	
ASEF31	0.646	0.623		0.724			0.515	

Cronbach Alpha value for the whole scale is 0.806

Findings about the Confirmatory Factor Analysis and Reliability Levels of ACM, ASEF, and S-CM Scales

Confirmatory Factor Analysis was applied to ACM, ASEF, and S-CM Scales and maximum likelihood method was used in the analysis.

The confirmatory factor analysis, applied to ACM Scale after anticipated and theoretically accepted modifications among error terms, showed that Chi-Square ($\chi 2$) was 245.761 and degrees of freedom (df) was 122, ind cating that the model was statistically significant ($p<0.01$).

The confirmatory factor analysis for ASEF Scale after anticipated and theoretically accepted modifications among error terms, showed that Chi-Square ($\chi 2$) was 78.859 and

degrees of freedom (df) was 41, indicating that the model was statistically significant (p<0.01).

The confirmatory factor analysis, applied to S-CM Scale after anticipated and theoretically accepted modifications among error terms, showed that Chi-Square (χ2) was 64.524 and degrees of freedom (df) was 27, indicating that the model was statistically significant (p<0.01).

First-degree confirmatory factor analyses of the scales are conducted and the goodness of fit indexes (GFI) as to the results of the analysis is given in Table 5.

The value testing the conformity of the model recommended in the confirmatory factor analysis and the sampling included in the analysis is χ2 value (Schumacker, 2004). χ2 value tests the equivalence of the covariance matrix of the population to the covariance matrix used in the model. However, it is considered more suitable to use χ2/df value that is corrected by degress of freedom (df) because χ2 value is sensitive to the size of sampling and high χ2 values rise as the number of samplings increases (Bagozzi, 1981). The χ2/df values for the ACM, ASEF, and S-CM Scales in this research are calculated as 2.014, 1.923 and 2.390 respectively. As a result, the model is accepted statistically significant. Besides, the IFI values that do not exist in the table and that take both the size of sampling and the complexity of the model into consideration are found.967 for the ACM Scale.,976 for the ASEF Scale and.998 for the S-CM Scale, which refer to a good fit index.

According to the goodness of fit index as to the model given in Table 5, NFI and CFI values for ACM Scale are at acceptable fit level while RMSEA, GFI and AGFI values are at good fit index level. However, RMSEA, NFI, CFI, GFI and AGFI values for both S-CM Scale and ASEF Scale are all at good fit index level. These results indicate that the factors obtained from the exploratory factor analysis results of all three scales are also confirmed by the confirmatory factor analysis results.

Analysis of the Measurement Model

Figure 1 shows the model regarding the predictive power of ASEF level on ACM and S-CM levels, and the predictive power of ACM level on S-CM level. According to the model, Chi-Square (χ2) is 64.524 and degrees of freedom (df) is 27 in the model set for the hypothesis of the research, indicating that the model was statistically significant (p<0.01). χ2/df, RMSEA, NFI, CFI, GFI, AGFI and IFI values for the model are calculated as 2.429, 0.049, 0.922, 0.952, 0.966, 0.947 and 0.952 respectively. According to the goodness of fit index as to the model given in Table 5, NFI and CFI values at acceptable fit level while RMSEA, GFI and AGFI values are at good fit index level, which indicates that the model is accepted.

Table 6 shows the data about the hypothesis of the research.

Table 4. Factor analysis results for S-CM Scale

Item No	Factor covariance	Factor-1 loading	Factor loadings after rotation		Corrected item-total correlation	Cronbach alpha
			Factor –1	Factor –2		
S-CM1	0.961	0.950	0.908		0.932	0.990
S-CM3	0.978	0.951	0.924		0.934	
S-CM5	0.960	0.936	0.925		0.915	
S-CM6	0.945	0.932	0.912		0.910	
S-CM12	0.919	0.931	0.883		0.911	
S-CM14	0.930	0.927	0.903		0.905	
S-CM16	0.927	0.912	0.916		0.888	
S-CM2	0.971	0.837		0.917	0.812	0.988
S-CM4	0.970	0.834		0.918	0.809	
S-CM13	0.962	0.821		0.921	0.794	
S-CM15	0.961	0.811		0.926	0.784	

Cronbach alpha value for the whole scale is 0.975

Table 5. The goodness of fit index regarding the model constructed in ACM, ASEF, and S-CM scales

Fit Measure	Good Fit	Acceptable Fit	ACM	ASEF	S-CM
RMSEA	0<REMSEA<0.05	0.05≤RMSEA≤0.10	0.042	0.040	0.049
NFI	0.95≤NFI≤1	0.90≤NFI≤0.95	0.936	0.952	0.996
CFI	0.97≤CFI≤1	0.95≤CFI≤0.97	0.966	0.976	0.998
GFI	0.95≤GFI≤1	0.90≤GFI≤0.95	0.961	0.978	0.982
AGFI	0.90≤AGFI≤1	0.85≤AGFI≤0.9	0.932	0.958	0.956
χ^2/df	$0<\chi^2/df<3$		245.761/122=2.014	78.859/41=1.923	64.524/27=2.390

*Schermelleh-Engel ve Moosbrugger, 2003: 23-74

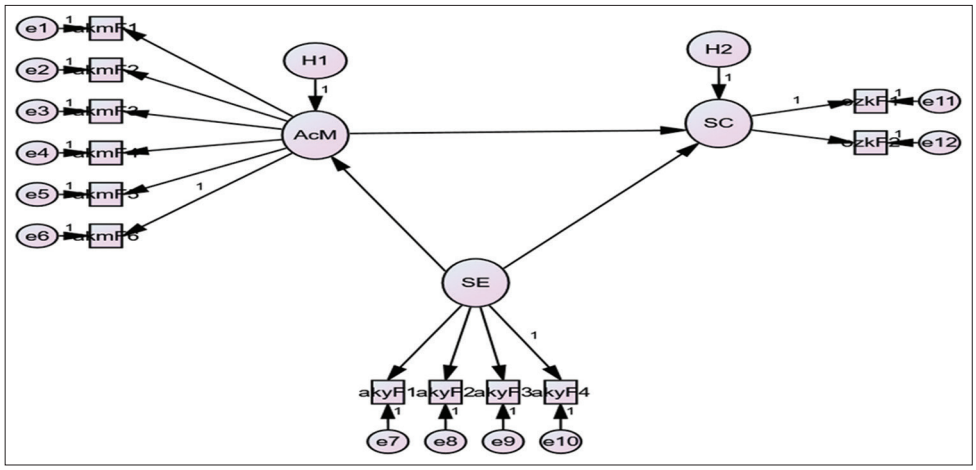

Figure 1. The model regarding the predictive power of ASEF level on ACM and S-CM levels, and the predictive power of ACM level on S-CM level

Table 6. Data about hypothesis

Hypothesis	Path	Path coefficient	t- value	Results
H1	ASEF→ACM	0.36	4.521*	Supported
H2	ASEF→SC-M	0.37	2.787*	Supported
H3	ACM→SC-M	–0.16	1.519	Rejected

According to the data in Table 6, the first two hypotheses that university students' ASEF levels predict both their ACM levels and S-CM levels significantly are supported. These results indicate that their ACM levels and S-CM levels predict their ASEF levels significantly as well. On the other hand, the data do not support the third hypothesis claiming that ACM levels predict S-CM levels, which means that S-CM levels do not predict ACM levels either.

DISCUSSION

In this section, the research results are discussed within the related literature which includes several studies on the relations among S-CM, ACM and ASEF.

Hypothesis 1

The research results support the 1st hypothesis that ASEF level is a significant predictor of ACM level, which indicates that ACM level predicts ASEF level as well. Corresponding to this result, Titrek et al. (2018) found in their study with 322 teacher candidates studying at 3rd and 4th grades at a faculty of education that there exists a significant and proportional correlation between ACM and ASEF levels. Hsieh, Sullivan and Guerra (2007) also indicated that students with high ASEF perceptions perform higher ACM in terms of skill and ability development or improvement while participating in academic activities, which is consistent with the result of this research. In another study with similar results, Kılıçoğlu (2018), who conducted a study with 305 secondary school students and investigated the relation between the participants' ASEF and ACM levels in social studies course, revealed that the intrinsic and extrinsic motivation level predicts ASEF level and explain 64% of it.

In a similar study, Aydın (2015) examined the relation between the ASEF levels and ACM levels of high-school students and revealed that ASEF was a significant predictor of intrinsic ACM, which coincides with the finding of this study. Similarly, Doménech-Betoret, Abellán-Roselló and Gómez-Artiga, (2017) found in their study with 797 secondary school students that ACM was a mediator between ASEF and academic achievement, underlying the correlation between ASEF and ACM. This finding is similar to the finding obtained in this study. Khalaila (2015) also found in the study with 170 nursery students that ASEF perception affected ACM indirectly but considerably. In another study with nursery students, it was concluded that there existed a significant and proportional relation between ASEF and ACM (Hassankhani et al., 2015), which supports the finding of this study claiming that there exists a significant and proportional correlation between ACM and ASEF levels.

Alivernini and Lucidi (2011) reached a similar conclusion in their study with 426 high-school students and showed the effect of ASEF perception on intrinsic ACM. Similarly, Doğan (2015) revealed in the study with 578 secondary school students that students with high SEF perception levels managed to keep their ACM levels as well, showing the effect of ASEF perception on ACM. In the study with 251 pre-school teachers, Bedel (2015) investigated the relation among ASEF, ACM and attitude towards teaching profession and found that ASEF was a significant predictor of ACM. Yusuf (2011), who studied ASEF and ACM together with learning strategies and academic achievement, also revealed that ASEF perception had a mediator role between ACM and learning strategies, underlying the relation between ASEF and ACM.

On the other hand, there are also some studies in the literature that contradict the results of the current study. For

example; Furnham, Chamorro-Premuzic and McDougall (2003) found in their study with 334 primary school students that no significant proportional relation existed between perceived ASEF and ACM. In fact, the researches revealed that high perceived ASEF level leads to over self-confidence, resulting in a decrease in ACM. De Feyter et al. (2012) conducted a study with 375 university students and investigated the relation between the ASEF levels and ACM levels of emotionally neurotic students and emotionally stable ones. The researchers revealed that while there was no significant relation between the ASEF and ACM levels of emotionally neurotic students, emotionally stable students with high ASEF levels had low ACM levels because they are over self-confident. The contradiction between the findings of these studies and that of the current study may result from the differences in the samplings.

Hypothesis 2

The results of the current research supports hypothesis 2 of the research which claims that ASEF perception is a predictor of S-CM skill. In this context, it is concluded that S-CM skill and ASEF predict each other. Although S-CM skills are mostly addressed within the context of health and medicine in literature, there are also studies that deal with the issue in academic context and reveal similar results to those of the current research. For example; Lavasani et al. (2011) conducted a study with female 5th grade students in two different schools and investigated the effects of self-regulation or S-CM, education on ASEF perception. The researchers formed four 23-student classes and divided them as control and experimental groups. The results of the study showed that the 12-session S-CM education given to the experimental group affected students' both ASEF levels and ACMs positively and significantly. Indicating that ASEF has a correlational and proportional relation with both S-CM perception and ACM, this result is consistent with both hypothesis 1 and 2 of the current research.

In another study on the issue, Gawrilow et al. (2014) investigated the relation between S-CM skills and ASEF levels in terms of mathematical skills. The researchers asked both the students and the parents to evaluate the students' S-CM skills. According to the results obtained in the sessions in which mathematical skills of the students were assessed, there exist significant and proportional relation between S-CM perceptions and SEF levels. Balkis (2011) also found a similar result in the study conducted with 364 students at a faculty of education. In the study that examined the relation between ASEF perception and academic procrastination behaviours, it was revealed that students with low ASEF levels performed more procrastination behaviours. Claiming that procrastination results from a series of deficiencies including S-CM skills, the researcher points out the proportional correlation between S-CM, and ASEF.

Hypothesis 3

Hypothesis 3 claims that ACM is a predictor of S-CM skills. However, the results of the research do not support this hypothesis. In other words, there is no significant relation between S-CM perceptions and ACM levels of university students. As S-CM skills are addressed mostly in the context of health and medicine, no studies directly examining the relation between these skills and ACM could be found in the literature. However, there are studies revealing indirect results as to the issue. For example; in their experimental research with freshman students who failed or hardly passed their first exams at university, Wilson and Lizzio (2008) conducted interviews with the experimental group, in which ASEF expectations that students were supposed to meet were clearly defined and academic planning processes were determined in line with these expectations. As a result of these interviews conducted through e-mail, phone or face-to-face, it was found that experimental group students' ASEF beliefs and their ACM improved as their self-regulation or S-CM skills improved, which contradicts with the result of our study revealing that there is no correlation between S-CM skills and ACM levels. The reason why there was no significant relation between the S-CM skills and ACM levels of the participants may be because they were not aware that there were self-control and self-management skills which could affect their academic success positively.

CONCLUSION

In this research, three hypotheses were tested. According to the findings, the 1st hypothesis that ASEF level is a significant predictor of ACM level and the 2nd hypothesis that ASEF perception is a predictor of S-CM skill were supported in the research. In this sense, it is concluded that ASEF is a significant predictor of both ACM levels and S-CM levels of students. On the other hand, the 3rd hypothesis which claims that ACM is a predictor of S-CM skills is not supported by the findings of the research. This shows that S-CM perceptions and ACM levels of university students do not significantly affect each other.

The results show that ASEF has a significant effect on university students' ACM levels and S-CM perceptions. Thus, it is recommended that students be informed well at the onset of their university education about the ASEF expectations they are supposed to meet. In this way, S-CM skills of those students who are aware of what they are expected to do academically will improve and they will feel themselves more motivated academically.

This research examines the relation among S-CM, ACM, and ASEF in general rather than focusing on the scales at item and factor level. Therefore, it is recommended that further be conducted examining the relations at item and factor level. In the light of such studies, it will be possible to provide more detailed and clear results on the issue.

It is also recommended that mixed method researches be carried out to investigate the reasons underlying the relations between ASEF perceptions, ACM and S-CM skills. Such studies will enable any educational program to know what to focus on in order to improve their students' ACM, ASEF, and S-CM levels.

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