



Gender Differences in Academic Motivation: A Meta-Analysis

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ABSTRACT

The purpose of this study is to carry out a meta-analysis study on the results of the studies on the effect of gender on academic motivation in Turkey between 2004 and 2019. For this purpose, this study aims to present a comprehensive study in which the results of the studies on this matter were combined and extended by using meta-analysis method. The study contains the gender comparison by the size value of its effect on academic motivation and the sub-group analyses. In addition, meta-analysis study was made on the effect of gender on sub-dimensions of the academic motivation in the studies that were made by using the scale "Academic Motivation Scale" developed by (Bozanoğlu, 2004). First of all, relevant studies were pooled in the meta-analysis study; then, 22 studies that comply with the research criteria were included in the analysis based on the total of academic motivation scale. The analysis based on the total point of academic motivation scale in the study contains 8010 students. 8 studies on the effect of gender on the sub-dimensions of academic motivation were included in the analysis. The analysis based on the sub-dimensions of academic motivation contains 3017 students. According to study findings, random effects model demonstrates that the effect of gender on the sub-dimensions of academic motivation is at low significance level (Cohen d value -0.07). In this study, analog ANOVA was employed for sub-group analysis by publication type and sample group of the research subject. Therefore, the sample group of the research subject differed by variance ($Q_b = 5.96, df = 2, p < .05$). The effect of gender on exploration dimension (Cohen d value -0.12), self-transcendence dimension (Cohen d value -0.08), and dimension of using knowledge (Cohen d value -0.18) which are the sub-dimensions of academic motivation is at low significance level.

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Keywords:

Academic motivation; gender; meta-analysis

1. Introduction

We found that it is important to analyse validity of the effect of gender on academic motivation in the Turkish context to contribute to Turkish literature. First of all, we examined the concept and properties of motivation and found that the concept of motivation is generally defined by scientists as objectives (Scholer and Higgins, 2008). Motivation may contain various processes such as focusing on a specific subject and developing plans. In other words, motivation is defined as a drive to take action. Accordingly, there isn't any drive to approach an object without a drive for motivation. Besides, levels of motivation are defined according to Elliot (2008) and they range from relatively lower analysis levels to higher ones.

Motivation has become one of the important qualifications in education process. The reason is that, motivation level is influential for students to complete a qualified and efficient learning process. We found that academic outputs vary by difference in motivation level in the studies (Vallerand and Bissonnette, 1992; Vallerand et al., 1992). In other words, there are significant differences between academic outputs of an individual with high motivation level and the one with low motivation level. Participation of the students in

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activities such as doing homework, preparing for exams and attendance to lesson may vary by their motivation level.

Academic motivation is shortly defined as “production of the energy required for academic works” (Bozanoğlu, 2004, p.84). Most of the recent studies on academic motivation are comprised of definition of motivation structure of students and assessments on organizing the process and results of their achievement (Schunk, Pintrich and Meece, 2008). In addition, many studies were conducted on academic motivation and academic deferral. According to the results of the studies, the reason is that tendency to academic motivation decreases as the tendency to academic deferral increases (Bond and Feather, 1988; Senecal, Koestner and Vallerand 1995; Orpen, 1998; Lee, 2005; Balkıs et al., 2006; Lekich, 2006; Klassen, Krawchuk and Rajani 2007).

The studies on the effect on academic motivation in the literature analysed academic motivation in terms of such different variables as gender, socio-economic status, and educational background. Studies that analyse the effect levels of gender on academic motivation by various variables are also found in the literature (Ertem, 2006; Gündüz, Şahin, and Önal, 2009; Hotaman, and Yüksel-Sahin, 2010; Bedel, 2013; Polat, 2013; Aktaş, 2017; Demir and Arı, 2013; Eroğlu, Yıldırım and Şahan, 2017; Özgül and Diker, 2017; Pala, 2019;).

In this study, studies on the effect of gender on academic motivation were made on different fields of study. A study was found on the effect of gender on academic motivation which is focused on the students of faculty of education (Saracaloglu, 2008; Saracaloğlu, Kumral, and Kanma, 2009; Şahin and Çakar, 2011; Terzi, Mahmut, and Gürbüz, 2012; Demir and Arı, 2013; Özgül and Diker, 2017; Terzi, Uyangor, and Dulker, 2017; Titrek, Çetin, Kaymak, and Kaşıkçı, 2018; Pala, 2019). A study was also found on the effect of gender on academic motivation which is focused on the students of faculty of theology (Aktaş, 2017; Yıldız, Sezen and Yenen, 2007). Another study was on the effect of gender on academic motivation which is focused on the university students in all faculties (Hotaman and Yüksel-Sahin, 2010; Ramazan and Kutlu, 2018).

It is noted that there are many studies in Turkey which analyse the effect of gender on academic motivation. Therefore, it is aimed to demonstrate the effect of gender on academic motivation by combining the results of the articles and thesis published on this subject separately.

The hypothesis sentences examined in the research are as follows.

- Hypothesis 1: There is a significant difference of gender differences in academic motivation.
- Hypothesis 2: There is a significant difference of sub-dimension effect on gender differences in academic motivation.
- Hypothesis 3: There is a significant difference of type of publication effect on gender differences in academic motivation.
- Hypothesis 4: There is a significant difference of sample group effect on gender differences in academic motivation. Display quotations of over 40 words or as needed.

2. Method

Study Design

The effect of gender on academic motivation was revealed by using meta-analysis method in this study. The studies made by using meta-analysis method are focused on a subject determined by the researcher. A generalizable result is achieved by integrating the results of the studies on a specific subject in the studies where this method is used (Littel, Corcoran and Pillai, 2008). Meta-analysis studies aims to identify the effect values through the data obtained from the studies on a specific subject and perform analysis suitable for the purpose of study by using the quantitative data obtained from the studies (Cohen, Manion and Morrison, 2001).

Scanning Strategy and Inclusion/Exclusion Criteria

Literature review was made in the databases of Google scholar, YOK National Thesis Center, ERIC,

ULAKBIM National Database, and DergiPark in order to determine the studies to be included in the meta-analysis in this study. Review studies were made based on academic motivation and gender. We searched the Turkish pages in Google scholar database by entering the keywords “academic motivation” and “gender”. September 2019 was set as deadline for the studies included in the meta-analysis study. The articles, postgraduate theses, and doctoral theses in the peer-reviewed journals were included in the analysis.

The inclusion criteria determined for the meta-analysis study on the effect of gender on academic motivation are as follows;

- The study was made after the year 2004,
- Presence of the data required for determining the effect sizes in the meta-analysis study,
- Presentation of sample size (n) value, mean (X) value, p value, and standard deviation (Sd) value based on gender,
- The studies are thesis, articles or full-text studies in Turkish or English languages,

The inclusion criteria for the meta-analysis study on the effect of gender on the sub-dimensions of academic motivation are as follows:

- The study was made after the year 2004,
- "Academic Motivation Scale" developed by Bozanoğlu, (2004) was used, and sample size (n), mean (X) value, p value and standard deviation (Sd) values related to the three sub-dimensions “Self-Transcendence”, “Using Knowledge” and “Exploration” were presented on gender basis,
- Presence of the data required to determine the effect sizes in the meta-analysis study,
- The studies are thesis, articles or full-text studies in Turkish or English languages

The reasons for non-inclusion of studies in the meta-analysis are as follows:

- There isn't any quantitative data,
- The necessary data on gender basis are not presented in the studies,
- Full-text version of the studies cannot be accessed acquiring data.

Academic Motivation Scale

"Academic Motivation Scale" was developed by Bozanoğlu, (2004) and grouped in three sub-dimensions. These sub-dimensions were named as “Self-Transcendence”, “Using Knowledge” and “Exploration”. The scale consists of 20 items in total. 5-point Likert scale was used for the measurement tool AMS as (1) ‘Definitely Not Applicable’ and (5) ‘Definitely Applicable’. Only the item 4 has negative meaning in the measurement tool. All the other items except for this one have positive meanings. Analysis was performed on validity, reliability, and usefulness of the measurement tool. Test-retest method was used for reliability analysis. The correlation between the two applications was found 0.87 as a result of the analysis. There is a high correlation between the two applications. In the meantime, the coefficient of internal consistency was calculated. The coefficients of Cronbach Alpha internal consistency were found 0.80, 0.75, and 0.67 respectively for the sub-dimensions. Cronbach Alpha value of the whole scale was found 0.86.

The data obtained from the databases by using scanning strategy were pooled (N = 190). They are analysed by the inclusion criteria, 22 studies were included in the study. Descriptive statistics on the studies which are suitable for the study criteria are presented in Table 1 below.

Table 1. Characteristics of the studies included in the meta-analysis on the effect of gender on academic motivation

Year of Publication	n	2013-2017	2018-2019	Total
		4	4	8

	%	0,50	0,50	100
		Article	Thesis	
Publication Type	n	3	5	8
	%	0,38	0,62	100
		High school student	Teacher candidate	
Sample group	n	2	6	8
	%	0,25	0,75	100

Coding Process

In coding process of the study, data were identified first; then the data were made suitable for the study by organizing the complex data in the studies comprehensibly. A coding form was prepared for the data of the studies included in the analysis by using this method.

References, publication date, Type of Publication (thesis, article), sample type (high school or middle-school student, university student, teacher candidate) and quantitative values (sample size, mean and standard deviation or p value) of the studies were coded in this form.

Table 3. Descriptive characteristics of the studies included in the meta-analysis on the effect of gender on Academic Motivation

Study	Year of publication	Type of publication	Sample group	Male	Female
Aktaş, H. 2017	2017	Article	Uni. Student	126	219
Bedel, 2013	2013	Article	High school or middle-school student	188	156
Demir and Arı, 2013	2013	Article	Teacher candidate	105	178
Eroğlu, Yıldırım and Şahan, 2017	2017	Article	Uni. student	171	177
Ertem, 2006	2006	Thesis	High school or middle-school student	438	279
Gündüz, Şahin, and Önal, 2009	2009	Article	Uni. student	1090	469
Hotaman, and Yüksel-Sahin, 2010	2010	Article	Uni. student	116	218
Özgül, and Diker, 2017	2017	Article	Teacher candidate	61	39
Pala, 2019	2019	Thesis	Teacher candidate	177	303
Polat, 2013	2013	Thesis	Uni. student	64	101
Ramazan, and Kutlu, 2018	2018	Article	Uni. student	112	331
Şahin and Çakar, 2011	2011	Article	Teacher candidate	86	118
Saracaloglu, 2008	2008	Article	Teacher candidate	142	176

Saracaloğlu, Kumral and Kanma, 2009	2009	Article	Teacher candidate	41	65
Şeker, 2017	2017	Article	Uni. student	205	147
Terzi, Mahmut, and Gürbüz, 2012	2012	Article	Teacher candidate	48	200
Terzi, Uyangor, and Dulker, 2017	2017	Article	Teacher candidate	102	269
Titrek, Çetin, Kaymak, and Kaşıkçı, 2018	2018	Article	Teacher candidate	96	226
Toplu, 2019	2019	Thesis	High school or middle-school student	100	100
Tuncer, Yelken, and Tanrıseven, 2018	2018	Article	Uni. student	29	101
Uluişik, Beyleroğlu, Suna, and Yalçın, 2016	2016	Article	High school or middle-school student	194	191
Yıldız, Sezen, and Yenen, 2007	2007	Article	Uni. Student	126	130

Table 4. Descriptive characteristics of the studies included in the meta-analysis on the effect of gender on the sub-dimensions of academic motivation

Author Name	Year of Publication of the Study	Branch	Study Type	Sample Group	Gender	
					Male N	Female N
Akbaba, 2019	2019	High School	Thesis	High School Students	280	360
Alemdağ, Öncü, & Yılmaz, 2014.	2014	Physical Education	Article	Teacher Candidate	127	75
Deniz, 2019	2019	High School	Thesis	High School Students	265	185
Eğmir, Ödemiş, Bayar, Bayar, & Kayır, 2013	2013	Educational Sciences	Article	Teacher Candidate	54	53
Pala, 2019	2019	Educational Sciences	Thesis	Teacher Candidate	177	303
Şeker, 2017	2017	Music Education	Thesis	Teacher Candidate	205	147
Terzi, Uyangor, & Dulker, 2017	2017	Educational Sciences	Article	Teacher Candidate	102	269
Yusupu, 201	2018	Educational	Thesis	Teacher	218	197

Statistical Processes

Main objective of meta-analysis which is one of the scientific research methods is to identify net effect size based on the data obtained from the studies on a specific subject (Littell et al., 2008). The researcher then comes to a conclusion on the study subject as a result of the analysis based on the effect size value. Therefore, effect size value is important for meta-analysis studies.

This value is the effect size value obtained through statistical processes. It is a standard measurement value used to identify the level and direction of the correlation in the study (Borenstein, Hedges, Higgins and Rothstein, 2009). Various applications were developed to calculate effect size value in meta-analysis studies. A researcher who uses this method must pay attention to the purpose and design of the studies, and the data while deciding which effect size is suitable (Littell et al., 2008).

These approaches consist of three groups as follows:

- Standardized mean difference
- Correlation
- Odd ratio/risk ratio

In this study, the measurement tools and study groups in the studies that were determined according to the inclusion criteria vary significantly. Therefore, the studies were analysed based on the adjusted standardized effect size. Data of the studies included in this study were combined by means of the coding. Statistical interpretation of the results obtained from the data requires determination of a suitable model (Yıldız, 2002). There are two effect models in meta-analysis method, and these are fixed effect model and random effect model. Analyses and findings vary by the two meta-analytic effect size models. For this reason, determining the effect size suitable for the study is important. In this study, we deemed suitable to use random effects model instead of fixed effects model in meta-analysis processes. The reason is that generalization can be made based on the specific effect size if studies are not functionally equal in random effects model (Borenstein et al., 2009). Besides, the statistical packaged softwares Microsoft Excel and Comprehensive Meta-Analysis are used in this study.

Subgroup Analysis

The subgroups which may be influential in the effect size and were analysed in this study were identified as Type of Publication (thesis, article) and sample type (high school or middle-school student, university student, teacher candidate). Subgroup analysis helps finding if there is difference between subgroups based on the data obtained from the studies included (Littell et al., 2008). This study assessed if the difference between the subgroups are statistically significant by effect size. Only Q values were used in these analyses, and Q-statistics indicates if the difference between the subgroups is statistically significant.

Data Analysis

Two different researchers compared the article inclusion-exclusion processes, the processes of effect size value calculation and the analysis results in order to ensure reliability in the research process that was developed by using meta-analysis method. Results of the comparison made by the two researchers reveal that consistence is achieved. The limits set for interpretation of the standardized mean differences of Cohen (1988) and the effect sizes are specified below.

- If Cohen $d \leq .20$, the effect is insignificant,

- If $.20 \leq \text{Cohen } d \leq .50$, the effect is weak,
- If $.50 \leq \text{Cohen } d \leq .80$ the effect is moderate,
- If $\text{Cohen } d \geq .80$ the effect is strong.

Besides, test statistics were checked for heterogeneity in the data analysis, and the findings are presented according to the value I^2 in addition to the q-statistics.

- $I^2 < 25$ indicates low heterogeneity,
- $25 < I^2 < 50$ indicates moderate heterogeneity,
- $75 < I^2$ and above indicates high heterogeneity (Higgins and Thompson, 2002).

Upon evaluation of fixed effects or random effects model for using in the study for effect sizes, random effects model was preferred by reason of the fact that characteristics of sample groups and data collection tools in the studies vary significantly. There are subgroup variables in the study, so analog ANOVA analysis was performed for the subgroups. The main objective of analog ANOVA is to analyse if the effect size in meta-analyses vary in subgroups, and share similarities with ANOVA analysis. This analysis is a chi-square based subgroup analysis method (Lipsey ve Wilson, 2001). In this research, data analysis calculated using the CMA-3 software program.

3. Findings

This section presents the findings related to the effect of gender on academic motivation, effect size and subgroups analysis.

This study consists of 22 different studies included according to the previously-stated criteria, and they consist of 8010 students in total. Of the students, 48% are male and 52% are female. 1646 of them (920 males, 726 females) are high school or middle-school students while 3932 (2039 males, 1893 females) are university students, and 2432 (858 males, 1574 females) are university students who are teacher candidates.

Hypothesis 1: There is a significant difference of gender differences in academic motivation.

According to the analysis results, gender has weak effect on academic motivation ($n=22$, $p<.001$). Accordingly, male students exhibited higher levels of academic motivation behaviors than those of female students.

Table 5. Size of academic motivation effect of gender and heterogeneity test

	n	Mean Effect Size	z	Standard Error	CI (Confidence Interval)		Df	Q	p	I^2
					Lower Limit	Upper Limit				
Random Effects Model	22	-.07	1.42	.05	-.16	.03	21	79.12	.00	73.46

According to the data in the studies included in the meta-analysis, effect size was found -0.07 in random effects model. In this context, the data were analysed in homogeneity/heterogeneity test in order to find the effect size of both genders on academic motivation (Borenstein et al., 2009). According to table 4 above, the study was found heterogeneous as a result of the heterogeneity test ($Q= 79.12$, $p= .00$, $I^2= 73.46$). In addition, I^2 statistics which was developed as a complementary to Q-statistics helps achieving better results in heterogeneity (Petticrew and Roberts, 2006). The statistical value $I^2= 73.46$ revealed that the study has high heterogeneity rates (Cooper, Hedges and Valentine, 2009). Consequently, the effect size values in the study

were found by using random effects model.

Hypothesis 2: There is a significant difference of sub-dimension effect on gender differences in academic motivation.

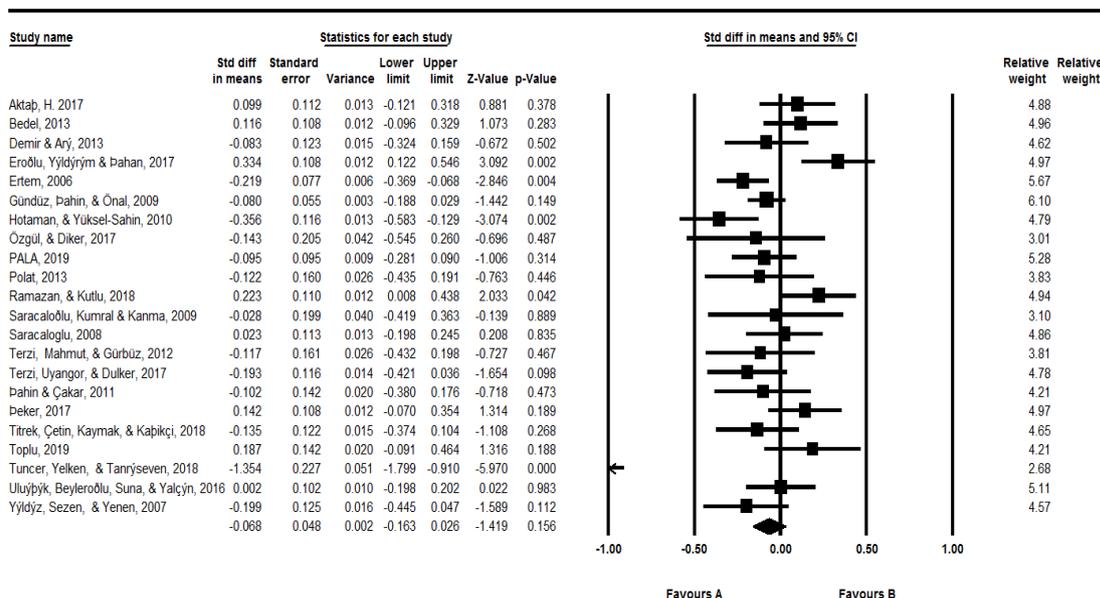
Table 6. Effect size of gender on the sub-dimensions of academic motivation and heterogeneity test

Subdimensins of Academic Motivation	Mean Effect Size	z	Standard Error	CI (Confidence Interval)		sd	Q	p	I ²
				Lower Limit	Upper Limit				
				Exploration dimension	-.12				
Self-transcendence dimension	-.08	2.19	.04	-.16	-.01				
Dimension of using knowledge	-.18	-4.81	.04	-.25	-.11				

Gender exhibits significantly weak effect in the sub-dimensions of academic motivation (Cohen d value - 0.12), self-transcendence dimension (Cohen d value -0.08), and dimension of using knowledge (Cohen d value -0.18). According to table 4 above, the study was found heterogeneous as a result of the heterogeneity test (Q= 45.47, p=.00, I²= 49.42). The statistical value I²= 49.42 revealed a moderate heterogeneity in the study (Cooper, Hedges and Valentine, 2009). Consequently, the effect size values in the study were found by using random effects model

Table 7. Summary of the study characteristics in analysis findings

Meta Analysis



Meta Analysis

Subgroup Analysis

In addition to the analyses for determining the common effect value, the findings of subgroup analysis are presented to indicate that the findings are heterogeneous. Analog ANOVA test was conducted to examine if the effect of gender on academic motivation varies by subgroups according to random effects model.

Subgroup analysis was performed for the Type of Publication (thesis and article) and sample group (high school or middle-school student, teacher candidate and university student). Findings are presented considering the values in the homogeneity test Q_b (Q-between) in the subgroup analysis. According to the results of the subgroup analysis, no significant difference was found in the effect of gender on academic motivation by Type of Publication ($Q_b = 1.21$, $df = 1$, $p > .05$). In other words, the effect of gender on academic motivation doesn't vary by Type of Publication.

Hypothesis 3: There is a significant difference of type of publication effect on gender differences in academic motivation.

Table 8. Subgroup analyses in random effects model

Variable	n	Average Effect Size	Standard Error	CI (Confidence Interval)		sd	,05 confidence level χ^2	Q_b	p
				Lower Limit	Upper Limit				
Type of publication n	Article	18	-.04	.04	-.12	.05			
	Thesis	4	-.31	.24	-.78	.17			
	Total	22	-.04	.04	-.13	.04	1	3.84	1.21

According to the table 9 below and the other subgroup analysis, significant difference was found on the effect of gender on academic motivation by sample group in the analysis on sample group ($Q_b = 5.96$, $df = 2$, $p < .05$). In other words, the effect of gender on academic motivation varies by sample group.

Hypothesis 4: There is a significant difference of sample group effect on gender differences in academic motivation.

Table 9. Subgroup analysis in random effects model

Variable	N	Mean Effect Size	Standard Error	CI (Confidence Interval)		sd	,05 confidence level χ^2	Q	p
				Lower Limit	Upper Limit				
Sample group	High school or middle school student	4	.12	.08	.04	.29			
	Teacher candidate	9	-.09	.05	.17	.02			
	University student	9	-.16	.10	.36	.04			
	Total	22	-.05	.04	-.13	.03	2	.99	.96

Publication bias

Publication bias influences the total effect negatively in meta-analysis studies, so it should also be discussed as well. Publication bias can be calculated by various statistical analyses. Funnel plot method was used in this study for the meta-analysis. According to Figure 1 below, there isn't any finding on publication bias in the studies included in the meta-analysis.

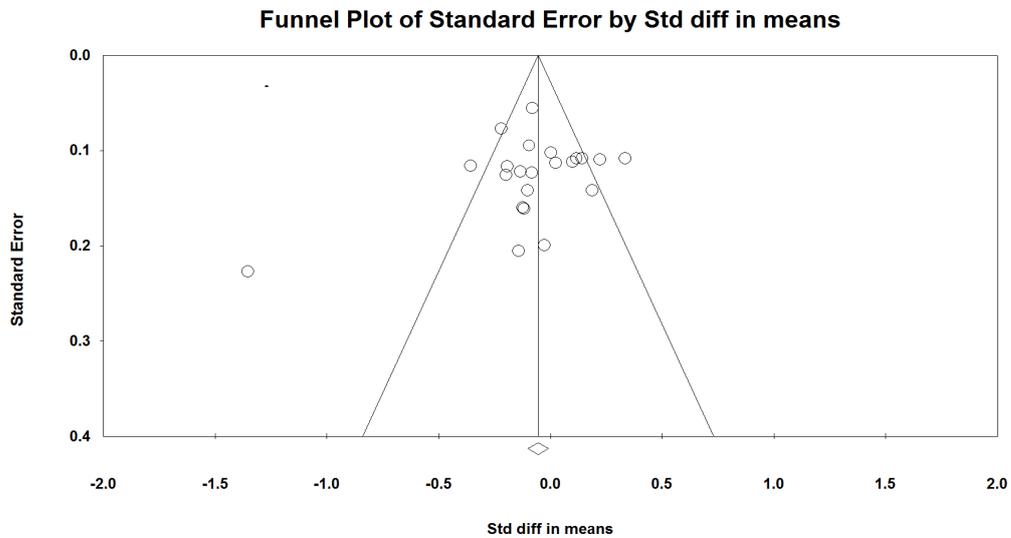


Figure 1. Effect size funnel on publication bias

Another analysis was also examined to check for publication bias; this analysis was performed for Duval, Tweedie's trim and fill test. The results of Duval, Tweedie's trim and fill test are given in Table 3.

Table 10. Results of Duval, Tweedie's trim and fill test on the effect of gender on academic motivation

	Excluded Study	Point Estimate	CI (Confidence Interval)		Q
			Lower Limit	Upper Limit	
Observed values		-.05467	-.1009	-.0084	79.1219
Adjusted values	1	..0754	-.1206	-.0302	95.9709

According to the findings on publication bias, no difference was found between the observed effect size value and the virtual effect size value for adjusting the effect caused by publication bias.

Table 11. Results of Duval, Tweedie's trim and fill test on the effect of gender on the sub-dimensions of academic motivation

	Excluded Study	Point Estimate	CI (Confidence Interval)		Q
			Lower Limit	Upper Limit	
Observed values		-.12662	-.16903	-.08421	45.47359
Adjusted values	0	-.12662	-.16903	-.08421	45.47359

According to the findings on publication bias in Table 6 above, no difference was found between the

observed effect size value and the virtual effect size value for adjusting the effect caused by publication bias.

4. Discussion and Conclusions

This study aims to conduct a meta-analysis study based on the results of experimental studies that examine the effect of gender on academic motivation in Turkey between 2004 and 2019. In this context, sample group size, mean, and standard deviation values and p value obtained from 22 studies that match the study criteria. Quantitative values from the articles and theses in the literature were reported. Besides, analog ANOVA analysis was performed on the effect of gender on the following subgroups of academic motivation; Type of Publication and sample group. The data that were reported in the study were obtained from 8010 students in total. Of these, 48% are male and 52% are female. 1646 of them (920 males, 726 females) are high school or middle-school students while 3932 of them (2039 males, 1893 females) are university students and 2432 of them (858 males, 1574 females) are university students who are teacher candidates.

According to the findings of this study, gender has significant effect on academic motivation. In examination of the effect size, it was concluded that the effect size is found insignificant (Cohen $d \leq .20$) according to the limits set for interpretation of the effect sizes and the standardized mean differences of Cohen'in (1988). It was also concluded that gender doesn't have a significant effect on academic motivation in the studies (Bedel, 2013; Pala, 2019; Demir and Ari, 2013; Saracaloğlu, Kumral and Kanma, 2009).

In examination of the findings on gender-based differences on academic motivation in the relevant literature, the effect may vary by Type of Publication and sample group. Type of variable studies (article and thesis), the effects of which were examined in the subgroup analysis are dealt in this study. Analog ANOVA test was conducted for this purpose, and no significant variable was found on the effect of gender on academic motivation by study types (article and thesis). In short, the effect of gender on academic motivation doesn't vary by article and thesis studies. The study published by Çıkrıkçı and Erzen (2016) dealt and analysed the variable of publication type in the meta-analysis on the concept of academic deferral which is the opposite of academic motivation. The researchers found that publication type is not a significant moderator in the study on examination of the effect of gender on academic deferral.

Sample groups (high school or middle-school student, teacher candidate and university student) were analysed as variables in another subgroup analysis. According to the findings of the study, sample groups are significant variables on the effect of gender on academic motivation. It was concluded that studying at different education stages is influential in the effect of gender difference on academic motivation. The effect of gender on academic motivation varies by teacher candidates and university students. In addition, the variable of personality characteristics in the sample group is the most influential variable in academic motivation according to the results of the analysis performed by other researchers (Ünal, 2013). Another meta-analysis study in the same field revealed that the effect of gender on academic deferral is not a significant moderator for the sample group (Çıkrıkçı and Erzen, 2016).

A meta-analysis was performed in this study based on the results of the experimental studies that examine the effect of gender on the sub-dimensions of academic motivation by using "Academic Motivation Scale" (Bozanoğlu, 2004) between 2004 and 2019. In this context, sample group size, mean, and standard deviation values and p value obtained from 8 studies that match the study criteria were examined. The data reported in the study were obtained from 3017 students in total. Of these, 1428 are male and 1589 are females. According to the findings of the study, it was concluded that gender has a significant effect on the sub-dimensions of academic motivation. In examination of the effect size, the effect was found insignificant Cohen $d \leq .20$ according to the limits set for interpretation of the effect sizes and standardized mean differences of Cohen (1988).

Different findings were obtained from the studies on the effect of gender on academic motivation in literature review. According to McDonald (2001), there are differences in comparison of anxiety levels by gender. Michie, Glachan and Bray (2001) found that females are more stressed and less self-confident in assessment of their academic skills by their peers. Bialis White (2013) carried out a study on the study group

consisting of European, American and Amerasian students. He concluded that satisfaction of basic psychological needs, motivation and academic achievement vary by gender. According to the study by Misra and Mc Kean (2000) on university students, anxiety level of students varies by gender.

In addition, there are findings in various studies in this field which present that gender doesn't have effect on academic motivation. According to Steinberg (2013) attitudes, capabilities and behaviors of teenagers are similar rather than varying by gender. According to Pala (2019), the points in all the dimensions in Academic Motivation Scale don't exhibit a significant difference by gender. According to Bedel (2013), gender doesn't cause any significant difference in academic motivation.

In general, this meta-analysis study is important in analyzing the effect of gender on academic motivation. There are many studies on the effect of gender on academic motivation in the literature, but this study became necessary as there isn't any meta-analysis study on this subject. This study presents an integrated conclusion of the data reported in different studies.

References

- Akbaba, T. (2019). Investigation of the effect of problematic internet usage on academic motivation among high school students. (Master's thesis) Bayburt University Institute of Social Sciences, Bayburt.
- Aktaş, H. (2017). The relationship between academic motivation and academic self-efficacy: an empirical research on theology faculty students. *Journal of Human and Social Sciences Research*, 6(3), 1376-1398.
- Alemdağ, C., Öncü, E., & Yılmaz, A. K. (2014). Academic motivation and academic self-competencies of physical education teacher candidates. *Journal of Sport Sciences*, 25(1), 23-35.
- Balkis, M., Invention, M., Duru, E., & Duru, S. (2006). Investigation of academic procrastination tendency among university students in terms of various variables. *Ege Education Journal*, 7, 57-73.
- Bedel, A. (2013). Comparison of academic empowerment and anxiety levels of students with and without grade repair. *Journal of National Education*, 43(200), 111-122.
- Bialis-White, L. H. (2013). Needs-satisfaction, motivation, and achievement in high school students: testing predictive models by gender and ethnicity (Doctoral dissertation) UC Berkeley.
- Bond, M. J., & Feather, N. T. (1988). Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology*, 55, 321-329.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). Introduction to Meta-Analysis. UK: Wiley.
- Bozanoğlu, İ. (2004). Academic motivation scale: Development, validity, reliability. *Ankara University Faculty of Educational Sciences Journal*, 37 (2), 83-98.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2009). The handbook of research synthesis and metaanalysis (2nd ed.). New York: Russell Sage Publication.
- Cohen, L., Manion, L., & Morrison, K. (2002). Research methods in education. Routledge.
- Cikrikci, O., & Erzen, E. (2016). Gender Differences on Academic Procrastination: Meta-Analysis. *Hacettepe University Journal of Education*, 31(4), 750-761.
- Demir, M., & Ari, E. (2013). Examination of prospective teachers' academic motivation levels in terms of various variables. *Theory and Practice in Education*, 9(3), 265-279.
- Deniz, Ç. (2013). The relationship between high school students' critical thinking dispositions, academic motivation and perfectionism levels and academic achievement (Master's thesis) Erciyes University, Institute of Educational Sciences.
- Eğmir, E., Ödemis, İ. S., Bayar, V., Bayar, A., & Kayır, G. (2013). Academic motivation levels of graduate students. Sakarya University Institute of Educational Sciences. VI. National Graduate Education Symposium. Proceedings, 95 (6), 97-103.
- Ertem, H. (2006). Examination of motivation type (internal and external) and levels of secondary school students in terms of some variables (Master's thesis) Balıkesir University Institute of Science and Technology.
- Elliot, A. J. (2008). Approach and avoidance motivation. In A. J. Elliot (Ed.), Handbook of approach and avoidance motivation. New York, NY: Psychology Press.

- Eroglu, O., Yildirim, Y., & Sahan, H. (2017). Investigation of the relationship between academic self-efficacy and academic motivation levels of students in the faculty of sports sciences: The case of Akdeniz University. *Turkey Journal of Sports Sciences*, 1(1), 38-47.
- Gunduz, S., Sahin, S., & Önal, F. (2009). Evaluation of websites of teaching staff of department of computer and instructional technologies education.
- Hotaman, D., & Yüksel-Sahin, F. (2010). The Effect of instructors' enthusiasm on university students' level of achievement motivation. *Egitim ve Bilim*, 35(155), 89.
- Klassen, R.M., Krawchuk, L.L., & Rajani, S. (2007). Academic procrastination of undergraduates low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, 33, 915-931.
- Littel, H. J., Corcoran, J., & Pillai, V. (2008). Systematic reviews and meta-analysis. New York: Oxford University Press.
- Lee, E. (2005). The relationship of motivation and flow experience to academic procrastination in university students. *Journal of Genetic Psychology*, 166, 5-14.
- Lekich, N. (2006). The relationship between academic motivation, self-esteem, and academic procrastination in college student. (Unpublished masters's thesis) Truman State University, Kirksville. Missouri, USA.
- Lipsey, M. W., & Wilson, D. B. (2001). Practical meta-analysis. Sage Publications, Inc.
- Littell, J. H., Corcoran, J., & Pillai, V. (2008). Systematic reviews and meta-analysis. Oxford University Press.
- McDonald, A. S. (2001) The prevalence and effects of test anxiety in school children. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 21(1), 89-101.
- Michie, F., Glachan, M., & Bray, D. (2001). An evaluation of factors influencing the academic self-concept, self-esteem and academic stress for direct and re-entry students in higher education. *Educational Psychology*, 21(4), 455-472.
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American journal of Health studies*, 16(1), 41.
- Orpen, C. (1998). The causes and consequences of academic procrastination: A research note. *Westminister Studies in Education*, 21, 73-75.
- Özgül, F., & Diker, G. (2017). Examination of academic self-efficacy and motivation according to demographic characteristics of graduate education candidates (Cumhuriyet University example) Lisansüstü eğitim adaylarının akademik öz-yeterlik ve güdülenmelerinin demografik özelliklerine göre incelenmesi (Cumhuriyet Üniversitesi örneği). *Journal of Human Sciences*, 14(2), 2129-2139.
- *Pala, G. (2019). The mediating role of psychological needs in the relationship between adolescent identity development and academic motivation and hope. (Master's thesis) Hacettepe Univeristy Institute of Educational Sciences, Ankara
- Petticrew, M., & Roberts, H. (2006). Systematic reviews in the social sciences. MA-USA: Blackwell.
- Polat, A. (2013). Investigation of Perceptions of Interrogation Group of Distance Education Students in Terms of Academic Motivation and Various Variables (Cumhuriyet University Case). (Master Thesis) Sakarya University Institute of Educational Sciences Department of Computer Education and Instructional Technology.
- Ramadan, Ç. O. K., & Kutlu, M. (2018). Investigation of university students' extracurricular internet usage behaviors and academic motivation levels according to various variables. *The Journal of International Lingual Social and Educational Sciences*, 4(1), 1-21.
- Saracaloglu, A. S. (2008). The relationship between academic motivation levels, research anxiety and attitudes and research competencies of graduate students. *Yüüncü Yıl University Journal of the Faculty of Education*, 5(2), 179-208.
- Saracaloglu, A. S., Kumral, A. G. O., & Blood, A. G. A. (2009). Secondary Education Social Fields Teacher Education Non-Thesis Students' Competencies, Concerns And Academic Motivation Levels Towards Teaching Profession (pp. 38-54). *Yüüncü Yıl University Journal of the Faculty of Education*, 6(2), 38-54.
- Scholer, A. A., & Higgins, E. T. (2008). Distinguishing levels of approach and avoidance: An analysis using regulatory focus theory. In A. J. Elliot (Ed.), *Handbook of approach and avoidance motivation*. New York, NY: Psychology Press

- Schunk, DH, Pintrich, PR, & Meece, JL (2008). *Motivation in education: Theory, research and applications* (3rd ed.), Upper Saddle River, NJ: Merrill-Prentice Hall.
- Senecal, C., Koestner, R., & Vallerand, R. J. (1995). Self-regulation and academic procrastination. *Journal of Social Psychology*, 135, 607-619.
- Steinberg, L. (2013). *Adolescence*. USA: McGraw-Hill Education.
- Şahin, H., & Çakar, E. (2011). The effect of learning strategies and academic motivation levels of faculty of education on academic achievement. *Turkish Journal of Educational Sciences*, 9(3), 519-540.
- Şeker, S. S. (2017). Academic motivation and academic self-efficacy levels of music education department teacher candidates. *Journal of Education Faculty of Abant İzzet Baysal University*.
- Terzi, M., Mahmut, Ü. N. A. L., & Gürbüz, M. Ç. (2012). Examining the academic motivation levels of elementary mathematics teacher candidates in terms of some variables. *Pegem Journal of Education and Training*, 2(1), 51-60.
- Terzi, A. R., Uyangor, N., & Dulker, A. P. (2017). Academic motivation and academic procrastination: A research on formation teacher candidates. *Route Educational and Social Science Journal*, 4(7), 52-62.
- Titrek, O., Cetin, C., Kaymak, E., & Kasikci, M. M. (2018). Academic Motivation and Academic Self-efficacy of Prospective Teachers. *Journal of Education and Training Studies*, 6(11a), 77-87.
- Toplu, G. (2019). Examination of the relationship between self-esteem and academic motivation of 5th grade students who started primary school in different age groups (Master's thesis) Maltepe University, Institute of Social Sciences, İstanbul.
- Tuncer, G., Yelken, T. Y., & Tannrıseven, I. (2018). Investigation of the relationship between academic motivation and questioning skills of philosophy group students. *Mersin University Journal of the Faculty of Education*, 14(3), 1156-1175.
- Uluişik, V., Beyleroğlu, M., Suna, G., & Yalcin, S. (2016). Attitudes of secondary school students towards physical education course and academic motivation levels according to some variables (sample of Burdur province center). *Journal of Human Sciences*, 13(3), 5092-5106.
- Ünal, M. (2013). Estimation of academic motivation levels of high school students in terms of some variables (Doctoral dissertation) DEU Institute of Educational Sciences
- Vallerand, R., & Bissonnette, R. (1992). On the predictive effects of intrinsic, extrinsic, and amotivational styles on behavior: A prospective study. *Journal of Personality*, 60, 599-620.
- Vallerand, R., Pelletier, L., Blais, M., Briere, N., Senécal, C., & Vallieres, E. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and amotivation in education. *Education and Psychological Measurement*, 52, 1003-1017.
- Yıldız, N. Ç. (2002). *Meta-Analysis of Data Evaluation* (Unpublished Master's Thesis). Marmara University, İstanbul.
- Yıldız, M., Sezen, A., & Yenen, İ. (2007). Examination of the relationship between state-trait anxiety levels and academic motivation among theology faculty students. *Journal of Theology Faculty*, 15, 213-239
- Yusupu, R. (2018). Relationships between career decisions and perfectionism, learning motivation and academic success in university students. (Master's thesis) Dokuz Eylül University, Institute of Educational Sciences, İzmir.