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The Effect of Procrastination on Academic Achievement: A Meta-Analysis Study*

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Abstract: The aim of the present study is to examine the effect level of procrastination on academic achievement. To this end, a meta-analytic approach was applied and the studies published between January 2000 and May 2020 in Education Resources Information Center (ERIC) and Academic Search Ultimate databases were included in the study. The research was limited to articles examining the correlation between the variables and, accordingly, the correlation coefficient was specified as an index to identify the effect size. After reviewing 22 relevant studies with 8307 participants, the meta-analysis was conducted through Comprehensive Meta-Analysis (CMA) software. The findings revealed that the variables were negatively correlated with each other and the overall effect size of procrastination on academic achievement was found -0.61, which can be interpreted as the medium effect size. The findings of the study endorse the main tenets of theoretical framework regarding the aforementioned link.

Keywords: Procrastination, academic achievement, academic success, meta-analysis, effect size.

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Introduction

Generally defined as “to put off intentionally the doing of something that should be done” (Merriam-Webster, n.d.), procrastination has long been an issue of scientific research (Beutel et al., 2016; Lay, 1986; Steel & Klingsieck, 2016) and giving a specific description for the term seems quite elusive (Steel, 2007) as it holds intra-individual variability (van Eerde, 2003). The term itself comes from the compilation of Latin words “pro”, meaning “forward” and “crastinate”, meaning “tomorrow” (Knaus, 2002, p. 7). Solomon and Rothblum (1984) define the term as one’s delaying a task unnecessarily and needlessly to the extent that postponing the task gives a kind of personal discomfort. In this sense, individuals who frequently procrastinate do know that they have to fulfill the tasks; however, they fail to do so due to their tendency to delay (He, 2017). Lay (1986), defining the term as “the tendency to postpone that which is necessary to reach some goal”, makes some additions later and argues that his earlier description underestimates the complexity of the concept, because the level of unattractiveness of the task, its imposition by the self or others, the individual’s views towards the task and its structure, all, have to be taken into consideration. Vij and Lomash (2014) take the concept of priority to the forefront and describe it as giving high and more priority to certain tasks. On the other hand, there are others who identify the term as intentionally drawing some tasks or duties forth or deliberately postponing and suspending a task to be done (Gustavson & Miyake, 2017; Schraw et al., 2007). Chu and Choi (2005) focus on emotional responses and define it as intentionally delaying the task in order not to encounter stress. Likewise, van Eerde (2003) also addresses the psychological aspects of procrastination and argues that it is broadly evaluated as a non-functional practice which brings about a feeling of guilt or committing an offense as well as poor performance.

Steel and Ferrari (2013), on the other hand, point to the notion of self-organization and describe it as a kind of self-regulatory failure in which individuals delay doing a task although it leads to worse cases. Ferrari et al. (1995) state that individuals who procrastinate start doing their tasks far later than they should. In this context, intentions that are not in line with the goals or objectives show a discrepancy with the target and these intentions are closely related to the individuals’ study behaviours. Thus, intentions of this kind and high levels of reluctance and averseness are the common features that could be ascribed to procrastinators. Further, certain distractions other than studying or doing

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an assignment seem to allure individuals tending to have procrastination behaviours. Ellis and Knaus (1977) handle the topic from another point of view and they associate procrastination with unreasonable worries and self-criticism. Procrastinators, to them, are not often sure of their ability to complete a given task, and thus postponing starts.

Steel (2007) notes that procrastination is a common phenomenon and that some people have made it as a way of life. As a support to this assumption, Ferrari (2017) asserts, "Everybody procrastinates, but not everybody is a procrastinator. 20% of men and women are clinical procrastinators, in school, at home, at work, in relationships. Though it is often regarded as a light problem, clinical procrastination is not a matter of poor time management." Thus, it could be concluded that procrastination is fairly widespread, and it might sometimes end up with a degree of depression or psychological disorder. Whether it is a serious psychological disorder or not, it seems that in an achievement oriented society, in which individuals are confronted with great changes and are required to catch up with the latest advances, procrastination could be a notable problem (van Eerde, 2003). It is assessed that the majority of college students (80-85%) from different levels involve in procrastination (Ellis & Knaus, 1977); 60% of university students procrastinate doing their tasks (Onwuegbuzie & Jiao, 2000); nearly 42% of students almost always procrastinate their term papers (Onwuegbuzie, 2004). Ferrari et al. (1995), marking a significant linear trend over three years among undergraduate students, point a rise of nearly 50% in procrastinating from freshman to senior classes. Balkis and Duru (2009), likewise, report 23% of university students procrastinate on academic tasks.

There have been several attempts to clarify the causes and correlations of procrastination (Ferrari, 2010; Steel, 2007) based on empirical studies and theoretical framework. Steel (2007) argues that the determinants of procrastination can be grouped under four headings: "task characteristics, individual differences, outcomes, and demographics". To be more specific, "timing of rewards and punishments" along with "task aversiveness" are analyzed under the heading of "task characteristics." "Neuroticism" ("low self-efficacy", "self-handicapping", "depression"), "openness to experience", "agreeableness", "extraversion" ("impulsiveness", "sensation seeking"), and "conscientiousness" form the "individual differences" section. While "mood", "performance" belongs to the heading "outcomes", "demographics" consists of two subtitles: "age" and "year". Apart from these, perfectionism is frequently claimed to be a significant motive for procrastination (Ellis & Knaus, 1977; Flett et al., 1995), since individuals need additional time to do their best and set excessively high, irrational and unattainable goals that hinder punctuality and bring about failure (Ferrari et al., 1995). Similarly, Solomon and Rothblum (1984) in their study conclude that "fear of failure" and "aversiveness of the task" account for most of the variance among other variables considered as the grounds for delaying behaviours. Likewise, Burka and Yuen (2008) argue that early negative experiences lead to acknowledged fears which, in the end, result in procrastination. Among other factors that have contributions to the emergence of procrastination include lack of commitment and guidance, inadequate time management talents, too much confidence, remarkable amount of stress, problems confronted in social lives (Hussain & Sultan, 2010; Rothblum et al., 1986), lack of self-esteem and self-confidence, along with non-competitiveness, depression, and anxiety (Ferrari & Tice, 2000; Rothblum et al., 1986), lack of intrinsic motivation (Dunn et al., 2014; Senecal et al., 1995), personal interest and good organizational skills (Schraw et al., 2007).

Procrastination, described as sometimes harmless, generally detrimental; yet never helpful (Steel, 2007) is closely related to academic achievement (Balkis et al., 2013; Tice & Baumeister, 1997). Upon reviewing related studies, it is viewed that, procrastination has frequently been ascribed to unfavourable consequences in education and academic success. While encountering hardly any of studies which mark a positive correlation (Demeter & Davis, 2013), negative correlations between procrastination and academic achievement have been pointed out repeatedly in numerous studies (Akça, 2012; Balkis & Duru, 2017; De Paola & Scoppa, 2015; Goroshit, 2018; Hayat et al., (In Press); Joubert, 2015; Kim & Seo, 2015; Lakshminarayan et al., 2013; Steel, 2007; You, 2015). As success is considered to pursuit individuals' intentions timely, people feel great when they succeed in doing something, the most basic form of which, according to Lay (2004), is the timely pursuit of their intentions. In this context, it is obvious that, individuals who procrastinate have some difficulties pursuing their goals on time and it seems that the sense of failure in fulfilling their intentions timely pave the way for frustration. When people even manage to do something, they are not able to enjoy their triumph due to last calls, last minute remarks and the fears of not being able to meet the deadline (Burka & Yuen, 2008).

Despite the negative connotations attributed to the concept in question, it is argued that procrastination could bring about some short-term benefits, as well (Chu & Choi, 2005). As a support to this assumption, Chu and Choi (2005) remark the findings of Tice and Baumeister's (1997) study which concludes that individuals who procrastinate compared to non-procrastinators can have less stress and can feel much more physically healthy if there is a lot of time for the task to be handed in. Within this context, procrastination could be assessed as a strategy to regulate emotions and feelings. Further, it can be argued that procrastination could help individuals to marshal their resources to deal with the imminent deadline. Thus, although the term procrastination is almost always associated with negative associations and implications, it may not always be an indicator that displays a negative impact. Therefore, it is believed that, a further thought and additional insight to comprehend the complex nature of the concept are required to develop a more detailed view in order to make it explicit that whether the term procrastination is always detrimental and has always negative effects on achievement and performance or its effect size on success is not that large and significant. In

addition, despite the fact that a large amount of research in the literature examine the link between procrastination and academic achievement or success, the number of studies focusing on a holistic view of procrastination on achievement is scarce. Therefore, the present study holds the hopes of assisting both academics and students to comprehend a holistic view regarding the effect size of procrastination on academic achievement. Within this scope, the aim of the present study emerged as follows: What is the effect level of procrastination on academic achievement?

To this end, analyzing several studies that examine the link between the mentioned variables in a more comprehensive and detailed way is thought to yield to a better understanding of the concept. It is, therefore, applying meta-analysis as a method, which enables researchers to gather data from multiple studies and various contexts, would be helpful to offer a holistic point of view and to interpret accumulated data from numerous studies. Further, while making generalizations or verifying assertions, validity and reliability could also be enhanced more by synthesizing data of various research rather than adhering to the results of a single study. For this purpose, the aim of the present study has been designed to analyse the findings of studies which focus on the correlations between procrastination and academic achievement. In this sense, it is aimed to find an answer to the question that whether procrastination has an effect on achievement and, if any, what the level of effect is by analyzing the asserted link between the variables in related studies through examining the data gained from large samples.

Method

As the method of the study, a meta-analytic approach was applied. A meta-analysis can be defined as a method to combine the results obtained from multiple studies in different contexts to reach a general result, or to re-analyze the results of a study. In other words, it is the process of grouping of related studies on a subject, theme or field of study under certain criteria and interpretation of these studies by combining the quantitative findings (Dinçer, 2014). It is a research procedure which methodically synthesises or combines the findings of independent and multiple studies by applying certain statistical methods in order to identify an overall effect size. In this sense, it should not be regarded merely as simply gathering data from a pool of studies having small sample groups. On the contrary, it is a systematic review of previously published studies and it holds the analysis of the various findings to reach a generalization across studies (Akobeng, 2005; Shorten & Shorten, 2013).

Data Collection

In line with the purpose of the study, the related articles were scanned and analysed. To this end, the studies published between January 2000 and May 2020 in Education Resources Information Center (ERIC) and Academic Search Ultimate databases were included in the study. Accordingly, a total of 51 studies were examined using the combination of keyword phrases such as “procrastination”, “academic procrastination” “academic achievement”, “academic success”, “academic performance.” Since the research was limited to articles examining the correlation between the variables and, accordingly, the correlation coefficient was specified as an index for the effect size, in the first place, some of them were eliminated as they did not present the required data. In the end, after a meticulous review, 22 studies were selected and included in the study to have necessary statistical analysis.

Data Analysis

The individual and overall effect sizes of the studies were calculated through the CMA (Comprehensive Meta-Analysis) program. Although the following scale has been arranged for Cohen's d , it can also be applied to Hedges' g while classifying the effect of the studies: $-0.15 \leq$ Cohen's d or Hedges' $g < 0.15$ negligible, $0.15 \leq$ Cohen's d or Hedges' $g < 0.40$ small, $0.40 \leq$ Cohen's d or Hedges' $g < 0.75$ medium, $0.75 \leq$ Cohen's d or Hedges' $g < 1.10$ large, $1.10 \leq$ Cohen's d or Hedges' $g < 1.45$ very large, $1.45 \leq$ Cohen's d or Hedges' g excellent (Dinçer, 2014). After computing the effect sizes of individual studies, the next step is to perform the heterogeneity test. The p and q values obtained after the test indicate whether the studies are homogeneous or heterogeneous. After the heterogeneity test, if the p value is less than 0.05 or the q value is greater than the value corresponding to the df value in the χ^2 table, this shows that the meta-analysis process is heterogeneous. In this case, the analysis should be conducted in the random effects model. However, if the p value is greater than 0.05 or the q value is less than the value corresponding to the df value in the χ^2 table, then, it means that there is no significant difference between the studies and the studies are in a homogeneous structure. In this case the analysis should be performed in the fixed effects model (Dinçer, 2014; Sarı & Ören, 2019).

Table 1 presents the descriptive statistics of the individual studies included in the research.

Table 1. Descriptive Statistics of the Studies Included in the Analysis

Years	Articles by Years		Sample Size by Years	
	f	%	f	%
2000-2010	-	-	-	-
2011	2	9.1	283	3.4
2012	3	13.6	862	10.3
2013	2	9.1	290	3.5
2014	1	4.5	574	6.9
2015	1	4.5	569	6.8
2016	1	4.5	224	2.7
2017	3	13.7	1048	12.7
2018	6	27.3	2123	25.6
2019	3	13.7	2334	28.1
2020	-	-	-	-
Total	22	100	8307	100

Table 1 shows the frequency and percentage distributions of the studies included in the research according to years and sample sizes. When the distribution of the studies is analyzed by years, it is seen that, the studies were mostly ($n=12$; 54.7%) conducted between the years 2017 and 2019. It is also observed that the least research ($n=5$; 22.6%) were done between 2013 and 2016. In addition, when the sample sizes are analyzed, it is seen that the studies have the largest sampling ($n=5505$; 66.4%) between the years 2017 and 2019.

Publication Bias

In order to specify the reliability and validity of the meta-analysis study along with determination of publication bias, Funnel plot and Rosenthal's Safe N method were applied. Publication bias occurs whether the studies in the analysis are systematically different from the whole population.

The Funnel plot of the effect sizes of the studies is given in Figure 1:

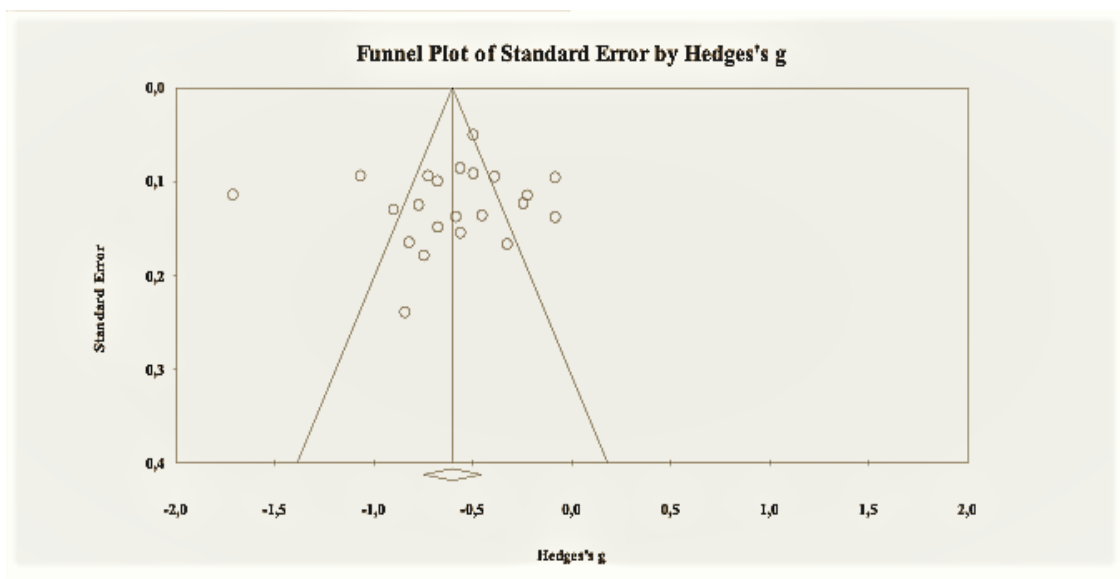


Figure 1. The Funnel plot of the effect sizes

The studies included in the research are expected to be in the funnel lines and in a symmetrical form. The line in the middle expresses the overall effect and studies are expected to gather around this line. In other words, if the effect sizes of the studies are distributed asymmetrically outside the funnel lines, they cause publication bias (Dinçer, 2014). Upon examining Figure 1, it could be concluded that the effect sizes of the studies are scattered close to a symmetrical shape. The distribution, which is close to a symmetrical shape, shows that publication bias is low. In order to analyze publication bias, Classic Fail-Safe N analysis were applied to the related to bias indicators of the funnel plot. The results of the analysis are presented in Table 2.

Table 2. Classic Fale-Safe N

Z-value for observed studies	-24.27
P-value for observed studies	0.00*
Alpha	0.05
Z for alpha	1.96
Number of observed studies	22
Number of missing studies that would bring p-value to > alpha	3353

*p<0.05

In the Classical Fale-Safe N, if the p value is lower than the alpha value, then data for the analysis is accepted as reliable and the publication bias of the analysis is within the acceptable ranges (Dinçer, 2014). When Table 2 is examined, it can be seen that the alpha value (0.05) is greater than the p value (0.00) and it can, therefore, be concluded that the data for the present study are reliable. According to the findings, 3353 individual studies have to be added to the analysis that would make p value greater than alpha value, thus nullifying the result of the meta-analysis study (p <.05).

Findings

After determining the publication bias, the analysis of the individual studies examining the mentioned association was conducted. The statistical results of the meta-analysis along with the overall effect size are demonstrated in Figure 2.

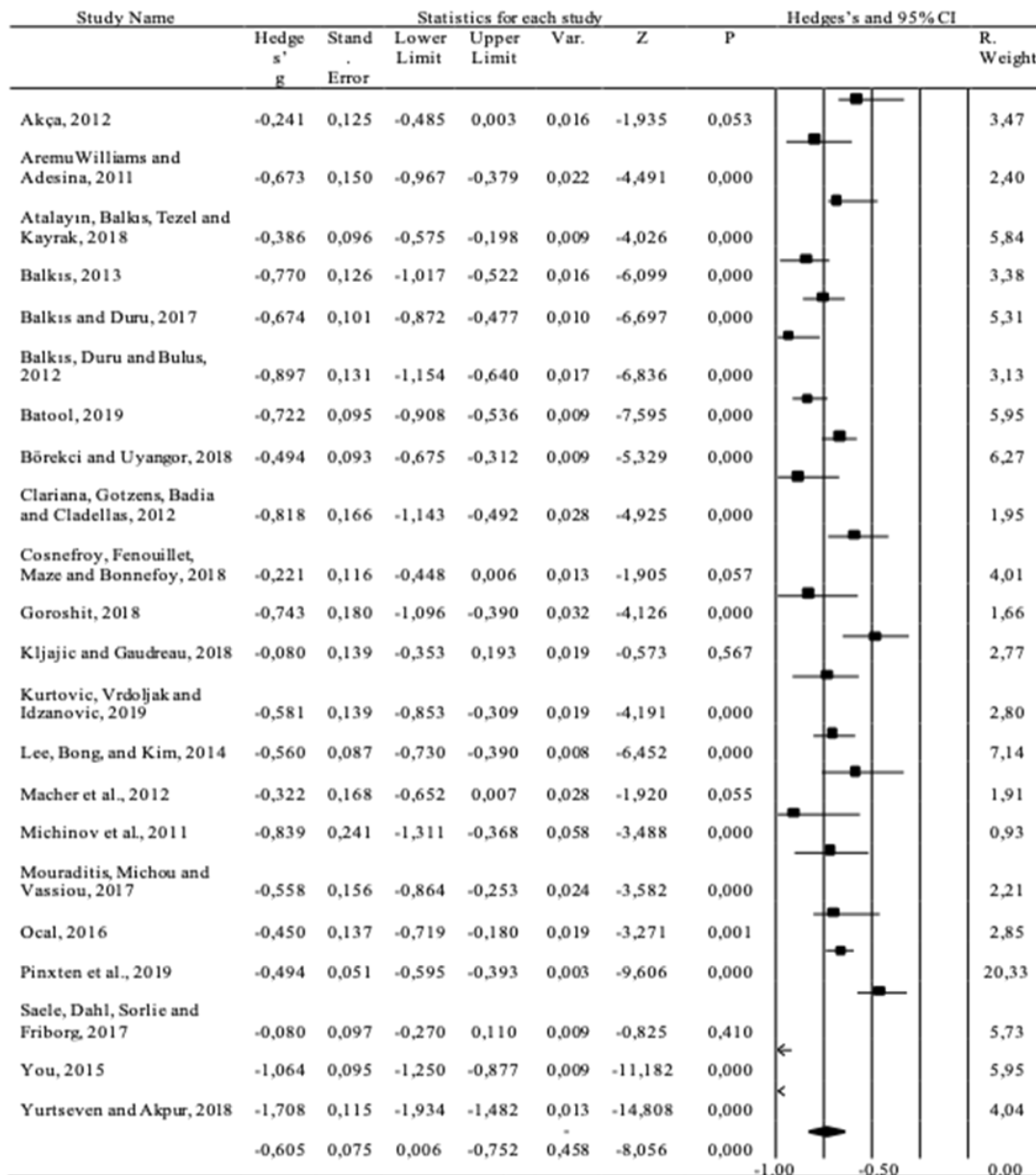


Figure 2. Findings and effect sizes of individual studies included in the analysis

Figure 2 shows the effect sizes of the individual studies included in the study along with the lower and upper limits of the effect sizes in the 95% confidence interval. The figures demonstrate that all of the studies have negative effects. On examining the effect sizes of the studies, it can be seen that the highest effect size value is -0.080 while the lowest effect size value is -1.708.

After examining the effect sizes of studies included in the analysis, the heterogeneity test was carried out in order to select the model to calculate the overall effect and the findings are demonstrated in Table 3.

Table 3. The heterogeneity test of the individual studies in the analysis

Model	N	Estim.	S. Err.	Var.	95% CI		Z-val.	p-val.	Q-val.	df (Q)	p-val.	I-squared
					Low.L.	Up. L						
Fixed	22	-0.583	0.023	0.001	-0.628	-0.537	-25.12	0.000	204.668	21	0.000	89.739
Random	22	-0.605	0.075	0.006	-0.752	-0.458	-8.056	0.000				

Table 3 presents the values of heterogeneity test of the studies in the research. As is seen, and the q value was found to be 204.668 and the p value to be 0.00. It can be concluded that the studies are heterogeneous because the q value is 41.401 in the χ^2 value range table for the 21 (df) degree of freedom and 95% significance level. Since 204.668 is greater than the critical level (41.401; $p < 0.005$) and p value is 0.000, random effects model was used in the analysis model and, accordingly, the overall effect size was calculated as -0.61. Upon reviewing the classification of the effect sizes, it can be seen that the value found in the analysis (-0.61.) is within the limits of 0.40 and 0.75 and can be interpreted that the effect size of procrastination on academic achievement is medium. As for the fixed effect size, the value was calculated to be -0.58, which, similarly, shows the medium effect size.

The analysis of the sample size of studies was also attached to the analysis and Table 4 shows the effect of procrastination on academic achievement according to sample size.

Table 4. The effect size of studies according to sample sizes

Sample Size (k)	N	Hedges's g	95% CI		Q-val.	Df (Q)	p value
			Low. L.	Up. L.			
0-500	17	-0.504	-0.630	-0.378			
Over 500	5	-0.903	-1.287	-0.518	3.936	1	0.053
Total	22	-0.543	-0.662	-0.423			

In Table 4, the effect sizes of studies according to sample size are presented. When the effect of procrastination on the academic achievement in terms of sample size was taken into consideration, the effect size was found to be -0.504 for the studies whose sample size is between 0-500 and -0.903 for the sample size over 500. Reviewing the values, it can be concluded that, the studies whose sample sizes are up to 500 have higher effect sizes than the studies having more than 500 participants.

Discussion

The purpose of the present study is to synthesize the findings of the studies conducted previously examining the effect level of procrastination on academic achievement. The research was limited to studies examining the correlation between the variables and, accordingly, the correlation coefficient was specified as the criterion in selecting. To this end, 22 relevant studies, matching the criteria, were decided on and reviewed. The studies published between January 2000 and May 2020 in Education Resources Information Center (ERIC) and Academic Search Ultimate databases were included in the study and the total sample size of the studies was 8307. After the heterogeneity test, the analysis was conducted through the random effects model and overall effect size was found -0.61, which corresponds to the medium effect size.

That the overall effect size has been found negative supports Steel's (2007) argument that procrastination is generally detrimental and never helpful. Thus, it can be argued that procrastination behaviours almost never end up with success. Kim and Seo (2015), in their meta-analysis, examined 33 related studies with a total of 38,529 participants and found that the link between procrastination and academic achievement is negative. Similarly, Steel (2007) in his meta-analysis study also marked the negative correlation between the mentioned variables. As a support to this assumption, many studies conducted in different samples revealed that procrastination behaviours were negatively correlated with academic achievement (Balkis & Duru, 2017; Dunn et al., 2014; Goroshit, 2018; Joubert, 2015; Kennedy & Tuckman, 2013; Klassen et al., 2010; Nwosu et al., 2018; van Eerde, 2003; Wu & Fan, 2017). Therefore, it appears that, procrastination or delaying intentionally to perform a task could be considered as a corollary of underachievement or poor grades and its echoes have certain reflections on success.

Another finding of the study is the difference of the effect sizes between the sample sizes up to 500 and over 500. It was found that, the effect size of the studies whose sample size was between 0-500 was higher than those whose sample

size was over 500. The difference could stem from the fact that applying the data collection tools and making the participants fill in the forms sincerely and meticulously might be much more difficult than small groups where the researchers may have a higher chance to explain his/her aims explicitly.

The other important point to be highlighted regarding the findings of the present meta-analysis study is the heterogeneity of effect size values. It is estimated that the asserted link between procrastination and academic achievement could be influenced by a number of factors and these issues could account for the causes of heterogeneity. It, thus, seems inevitable to mention or investigate the possible moderators. Theoretically, factors such as ability, guidance, the difficulty of the task, task characteristics, flexibility as well as adaptability (van Eerde, 2003) should be contemplated and hence various components that might affect the link should not be neglected. Another important element that could play a role in this relation is the variety of the data collection tools applied in studies. In some studies, authors claim the presence of active procrastination, which does not always display the traits of procrastination as argued. Further, the characteristics of performance criteria could also affect the existing negative link. It is believed that failures to meet deadlines could not be a strong indicator of low performance, which is generally assessed by external agents rather than by individual's own judgement (Kim & Seo, 2015). As a conclusion, while investigating and commenting on the assumed relation between the variables, it should be kept in mind that several moderators might have a role on the association.

As for the pedagogical practices in order to make the learners avoid procrastination, setting realistic and simple goals could help decrease the negative impacts of procrastination. Further, setting deadlines, applying efficient time management techniques, breaking down tasks into certain small and manageable steps, giving convenient rewards, eliminating or removing the distractions may help reduce procrastination.

Conclusion

The present research aimed to combine the results from multiple studies in different contexts to reach a general result, or to re-analyze the results of studies. To this end, articles examining the correlation between the procrastination and academic achievement were analyzed in accordance with the correlation coefficient value. In the end, 22 relevant studies with 8307 participants were included in the study. The findings revealed that the procrastination was negatively correlated with academic achievement and the overall effect size of procrastination on academic achievement was found -0.61, which can be interpreted as the medium effect size.

Suggestions

As the research was based on a specific statistical method, it is believed that, taking into account the other studies conducted in different and various statistical techniques could yield to valuable findings. In addition, in order to increase the reliability of the finding, future studies should increase the number of databases so that more studies and results could be assessed and analyzed for generalization. Furthermore, an in-depth analysis was not performed whether the findings vary in different cultures. The research in the future should also focus on the differentiation of cultural contexts to investigate whether the assumed link is influenced by the cultural factors.

Limitations

The present study is subject to certain limitations. Firstly, the studies included in the analysis were selected in accordance with a specific statistical method. To be more precise, the research was limited to articles examining the correlation between the variables and, accordingly, the correlation coefficient was specified as an index for the effect size, in the first place, some of them were eliminated as they did not present the required data. Therefore, studies examining the link with different methods and techniques were not included. In the second place, while retrieving the relevant studies from the databases, it is possible that some of the articles which should have been in the scope of the research could be neglected or misevaluated.

References

(References marked with an asterisk indicate studies included in the meta-analysis.)

- *Akça, F. (2012). An investigation into the self-handicapping behaviors of undergraduates in terms of academic procrastination, the locus of control and academic success. *Journal of Education and Learning*, 1(2), 288-297. <https://doi.org/10.5539/jel.v1n2p288>
- Akobeng, A. K. (2005). Understanding systematic reviews and meta-analysis. *Archives of Disease in Childhood*, 90, 845-8.
- *Aremu, A. O., Williams, T. M., & Adesina, F. T. (2011). Influence of academic procrastination and personality type on academic achievement and efficacy on in-school adolescents in Ibadan. *IFE Psychologia*, 191, 93-113.
- *Atalayin, Ç., Balkis, M., Tezel, H., & Kayrak, G. (2018). Procrastination and predictor variables among a group of dental students in Turkey. *Psychology, Health and Medicine*, 236, 726-732.

- *Balkıs, M. (2013). Academic procrastination, academic life satisfaction, and academic achievement: The mediation role of rational beliefs about studying. *Journal of Cognitive and Behavioral Psychotherapies*, 13(1), 57-74.
- Balkıs, M., & Duru, E. (2009). Prevalence of academic procrastination behavior among pre-service teachers, and its relation with demographics and individual preferences [Akademik erteleme davranışının öğretmen adayları arasındaki yaygınlığı, demografik özellikler ve bireysel tercihlerle ilişkisi]. *Journal of Theory and Practice in Education / Eğitimde Kuram ve Uygulama*, 5(1), 18-32.
- *Balkıs, M., & Duru, E. (2017). Gender differences in the relationship between academic procrastination, satisfaction with academic life and academic performance. *Electronic Journal of Research in Educational Psychology*, 15(1), 105-125. <https://doi.org/10.14204/ejrep.41.16042>
- *Balkıs, M., Duru, E., & Buluş, M. (2013). Analysis of the relation between academic procrastination, academic rational/irrational beliefs, time preferences to study for exams, and academic achievement: a structural model. *European Journal of Psychology of Education*, 28(3), 825-839. <https://doi.org/10.1007/s10212-012-0142-5>
- *Batool, S. S. (2019). Academic achievement: Interplay of positive parenting, self-esteem, and academic procrastination. *The Australian Psychological Society*, 72, 174-187. <https://doi.org/10.1111/ajpy.12280>
- Beutel M. E, Klein, E. M., Aufenanger, S., Brähler, E., Dreier, M., Müller, K. W, Quiring, O., Reinecke, L., Schmutzer, G., Stark, B., & Wöfling, K. (2016). Procrastination, distress and life satisfaction across the age range – A German representative community study. *PLoS ONE*, 11(2), 1-12. <https://doi.org/10.1371/journal.pone.0148054>
- Burka, J. B., & Yuen, L. M. (2008). *Procrastination: Why you do it, what to do about it now*. Da Capo Press.
- *Borekci, C., & Uyangor, N. (2018). Family attitude, academic procrastination and test anxiety as predictors of academic achievement. *International Journal of Educational Methodology*, 4(4), 219-226. <https://doi.org/10.12973/ijem.4.4.219>
- Chu, A. H. C., & Choi, J. N. (2005). Rethinking procrastination: Positive effects of 'active' procrastination behavior on attitudes and performance. *The Journal of Social Psychology*, 145(3), 245-264. <https://doi.org/10.3200/SOCP.145.3.245-264>
- *Clariana, M., Gotzens, C., Del Mar Badia, M., & Cladellas, R. (2012). Procrastinacion y engano academico desde la secundaria hasta la universidad [Procrastination and cheating from secondary school to university]. *Electronic Journal of Research in Educational Psychology*, 10(2), 737-754.
- *Cosnefroy, L., Fenouillet, F., Mazé, C., & Bonnefoy, B. (2018). On the relationship between the forethought phase of self-regulated learning and self-regulation failure. *Issues in Educational Research*, 28(2), 329-348.
- De Paola, M., & Scoppa, V. (2015). *Procrastination, academic success and the effectiveness of a remedial program* (IZA Discussion Paper No. 8021). [https://file:///Users/user/Downloads/dp8021%20\(1\).pdf](https://file:///Users/user/Downloads/dp8021%20(1).pdf)
- Demeter, D., & Davis, S. (2013). Procrastination as a tool: Exploring unconventional components of academic success. *Creative Education*, 4(7A2), 144-149. <https://doi.org/10.4236/ce.2013.47A2018>
- Dinçer, S. (2014). *Eğitim bilimlerinde uygulamalı meta-analiz*. Pegem Akademi.
- Dunn, K. E., Rakes, G. C., & Rakes, T. A. (2014). *The influence of perfectionism and achievement goal orientation on procrastination in online graduate students* [Paper presentation]. The American Educational Research Association Conference, Philadelphia, United States.
- Ellis, A., & Knaus, W. J. (1977). *Overcoming procrastination*. Institute for Rational Living.
- Ferrari J. R. (2010). *Still procrastinating: The no regrets guide to getting it done*. John Wiley and Sons.
- Ferrari, J. (2017, May 8). Are you a procrastinator? Here's how you're helping online scammers. *Guardian*.
- Ferrari, J. R., Johnson, J. L., & McCown, W. G. (1995). *Procrastination and task avoidance: Theory, research, and treatment*. Plenum Press
- Ferrari, J., & Tice, D. (2000). Procrastination as a self-handicap for men and women: A task-avoidance strategy in a laboratory setting. *Journal of Research in Personality*, 34(1), 73-83. <https://doi.org/10.1006/jrpe.1999.2261>.
- Flett, G. L., Hewitt, P. L., & Martin, T. R. (1995). Dimensions of perfectionism and procrastination. In J. R. Ferrari, J. L. Johnson, & W. G. McCown (Eds.), *Procrastination and task avoidance* (pp. 71-96). Springer.
- *Goroshit, M. (2018). Academic procrastination and academic performance: An initial basis for intervention. *Journal of Prevention and Intervention in the Community*, 46(2), 131-142. <https://doi.org/10.1080/10852352.2016.1198157>

- Gustavson, D. E., & Miyake, A. (2017). Academic procrastination and goal accomplishment: A combined experimental and individual differences investigation. *Learning and Individual Differences, 54*, 160–172. <https://doi.org/10.1016/j.lindif.2017.01.010>
- Hayat, A. A., Jahanian, M., Bazrafcan, L., & Shokrpour, N. (In Press). Prevalence of academic procrastination among medical students and its relationship with their academic achievement. *Shiraz E-Medical Journal Online*, 1-7. <https://doi.org/10.5812/semj.96049>
- He, S. (2017). A multivariate investigation into academic procrastination of university students. *Open Journal of Social Sciences, 5*, 12-24. <https://doi.org/10.4236/jss.2017.510002>
- Hussain, I., & Sultan, S. (2010). Analysis of procrastination among university students. *Procedia - Social and Behavioral Sciences, 5*, 1897-1904. <https://doi.org/10.1016/j.sbspro.2010.07.385>
- Joubert, C. P. (2015). *The relationship between procrastination and academic achievement of high school learners in North West province, South Africa* [Unpublished master's thesis]. University of South Africa.
- Kennedy, G. J., & Tuckman, B. W. (2013). An exploration into the influence of academic and social values, procrastination, and perceived school belongingness on academic performance. *Social Psychology of Education, 16*(3), 435–470. <https://doi.org/10.1007/s11218-013-9220-z>
- Kim, R. K., & Seo, H. E. (2015). The relationship between procrastination and academic performance: A meta-analysis. *Personality and Individual Differences, 82*, 26–33. <https://doi.org/10.1016/j.paid.2015.02.038>
- Klassen, M. R., Ang, R. P., Chong, W. H., Krawchuk, L. L., Huan, V. S., Wong, I. Y. F., & Yeo, L. S. (2010). Academic procrastination in two settings: Motivation correlates, behavioral patterns, and negative impact of procrastination in Canada and Singapore. *Applied Psychology, 59*(3), 361- 379.
- *Kljajic, K., & Gaudreau, P. (2018). Does it matter if students procrastinate more in some courses than in others? A multilevel perspective on procrastination and academic achievement. *Learning and Instruction, 58*, 193-200. <https://doi.org/10.1016/j.learninstruc.2018.06.005>
- Knaus, W. (2002). *The procrastination workbook*. New Harbinger Publications
- *Kurtovic, A., Vrdoljak, G., & Idzanovic, A. (2019). Predicting procrastination: The role of academic achievement, self-efficacy and perfectionism. *International Journal of Educational Psychology, 8*(1), 1-26. <https://doi.org/10.17583/ijep.2019.2993>
- Lay, C. H. (1986). At last, my research article on procrastination. *Journal of Research in Personality, 20*(4), 474 – 495.
- Lay, C. H. (2004). Some basic elements in counseling procrastinators. In H. C. Schouwenburg, C. H. Lay, T. A. Pychyl, & J. R. Ferrari (Eds.) *Counseling the procrastinator in academic settings* 43–58. American Psychological Association.
- Lakshminarayan, N., Potdar, S., & Reddy, S. G. (2013). Relationship between procrastination and academic performance among a group of undergraduate dental students in India. *Journal of Dental Education, 77*(4), 524-528. <https://doi.org/10.1002/j.0022-0337.2013.77.4.tb05499.x>
- *Lee, J., Bong, M., & Kim, S. (2014). Interaction between task values and self-efficacy on maladaptive achievement strategy use. *Educational Psychology, 34*(5), 538-560, <https://doi.org/10.1080/01443410.2014.895296>
- *Macher, D., Paechter, M., Papousek, I., & Ruggeri, K. (2012). Statistics anxiety, trait anxiety, learning behavior, and academic performance. *European Journal of Psychology of Education, 27*(4), 483-498. <https://doi.org/10.1007/s10212-011-0090-5>
- Merriam-Webster. (n.d.). Procrastination. In *Merriam-Webster.com dictionary*. Retrieved March 5, 2019, from <https://www.merriamwebster.com/>
- *Mouratidis, A., Michou, M., & Vassiou, A. (2017). Adolescents' autonomous functioning and implicit theories of ability as predictors of their school achievement and week-to-week study regulation and well-being. *Contemporary Educational Psychology, 48*, 56-66. <https://doi.org/10.1016/j.cedpsych.2016.09.001>
- *Michinov, N., Brunot, S., Le Bohec, O., Juhel, J., & Delaval, M. (2011). Procrastination, participation, and performance in online learning environments. *Computers and Education, 56*(1), 243-252. <https://doi.org/10.1016/j.compedu.2010.07.025>
- Nwosu, K. C., Okoyoe, C. C., & Onah, U. H. (2018). An interpretive descriptive study of factors affecting academic achievement of underachieving student teachers in Nigeria. *Journal of At-Risk Issues, 21*(2), 20-29.
- *Ocal, K. (2016). Predictors of academic procrastination and university life satisfaction among Turkish sport schools students. *Educational Research and Reviews, 11*(7), 482-490. <https://doi.org/10.5897/ERR2016.2645>

- Onwuegbuzie, J. A., & Jiao, Q. G. (2000). I'll go to the library later: The relationship between academic procrastination and library anxiety. *College and Research Libraries*, 61(1), 45-54.
- Onwuegbuzie, A. J. (2004). Academic procrastination and statistics anxiety. *Assessment and Evaluation in Higher Education*, 29(1), 3-19.
- *Pinxten, M., De Laet, T., Soom, C. V., Peeters, C., & Langie, G. (2019). Purposeful delay and academic achievement. A critical review of the Active Procrastination Scale. *Learning and Individual Differences*, 73, 42-51. <https://doi.org/10.1016/j.lindif.2019.04.010>
- Rothblum, E. D., Solomon, L. J., & Murakami, J. (1986). Affective, cognitive and behavioral differences between high and low procrastinators. *Journal of Counseling Psychology*, 33(4), 387-394.
- *Sæle, R.G., Dahl, T. I., Sørli, T., & Friborg, O. (2017). Relationships between learning approach, procrastination and academic achievement amongst first-year university students. *Higher Education*, 74(5), 757-774.
- Sarı, K., & Ören Şaşmaz, F. (2019). Araştırmaya Dayalı Öğrenme Stratejisinin Öğrencilerin Akademik Başarılarına Etkisi: Bir Meta Analiz Çalışması [The Effect of the Inquiry-Based Learning Strategy on Academic Achievements of the Students: A Study of Meta-Analysis]. *Hacettepe University Journal of Education/ Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 35(3), 540-555. <https://doi.org/10.16986/HUJE.2019052510>
- Schraw, G., Wadkins, T., & Olafson, L. (2007). Doing the things we do: A grounded theory of academic procrastination. *Journal of Educational Psychology*, 99(1), 12-25.
- Senecal, C., Koestner, R., & Vallerand, R. J. (1995). Self-regulation and academic procrastination. *The Journal of Social Psychology*, 135(5), 607-619. <https://doi.org/10.1080/00224545.1995.9712234>
- Shorten, A., & Shorten, B. (2013). What is meta-analysis? *Evidence Based Nursing*, 16(1), 3-4.
- Solomon, J. L., & Rothblum, E. D. (1984). Academic procrastination: Frequency and cognitive-behavioral correlates. *Journal of Counseling Psychology*, 31(4), 503- 509.
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, 133(1), 65-94.
- Steel, P., & Ferrari, J. (2013). Sex, Education and Procrastination: An Epidemiological Study of Procrastinators' Characteristics from a global sample. *European Journal of Personality*, 27(1), 51-58. <https://doi.org/10.1002/per.1851>
- Steel, P., & Klingsieck, K. B. (2016). Academic procrastination: Psychological antecedents revisited. *Australian Psychologist*, 5(11), 36-46. <https://doi.org/10.1111/ap.12173>
- Tice, D. M., & Baumeister, R. F. (1997). Longitudinal study of procrastination, performance, stress, and health: the costs and benefits of dawdling. *Psychological Science*, 8(6), 454-458. <https://doi.org/10.1111/j.1467-9280.1997.tb00460.x>
- van Eerde, W. (2003). A meta-analytically derived nomological network of procrastination. *Personality and Individual Differences*, 35, 1401-1418. <https://doi.org/10.1016/S0191-88690200358-6>
- Vij, J., & Lomash, H. (2014). Role of motivation in academic procrastination. *International Journal of Scientific and Engineering Research*, 5(8), 1065-1070.
- Wu, F., & Fan, W. (2017). Academic procrastination in linking motivation and achievement-related behaviours: a perspective of expectancy-value theory. *Educational Psychology*, 37(6), 695-711. <https://doi.org/10.1080/01443410.2016.1202901>
- *You, J. W. (2015). Examining the effect of academic procrastination on achievement using LMS data in e-learning. *Educational Technology and Society*, 18(3), 64-74.
- *Yurtseven, N., & Akpur, U. (2018). Perfectionism, anxiety and procrastination as predictors of EFL academic achievement: A mixed methods study. *Novitas-ROYAL (Research on Youth and Language)*, 122, 96-115.