

# The Relationship between Self-Control and General Procrastination in University Students: The Mediating Role of Optimism

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## ABSTRACT

Self-control, which is relevant to abandoning from the sudden impulses for a significant objective, the tendency of optimism meaning that good things will happen in the future, and the tendency to procrastination briefly defined as the gap between intention and action are significant variables having effects on the well-being of the individuals. In the related literature, no study was found addressing these three variables together. In this direction, the study intended to examine the mediating role of optimism in the relationship between self-control and general procrastination in the university students. The research is based on relational survey model. 327 university students having their study in the faculty of education of a state university in Turkey formed the sample of the research. The data of the research was collected by the use of brief self-control scale, general procrastination scale, optimism and pessimism scale, and adult form. SPSS 21 was used for descriptive data and Pearson correlation analysis, AMOS 23 was used for confirmatory factor analysis, and Process Macro 4.1 software (model 4) was used for the analysis of predicting and mediating relationships. In the research, it was determined that the significant relationships between self-control and general procrastination were in negative direction; that is to say, the ones between self-control and optimism were in positive direction, and the ones between optimism and general procrastination were in negative direction. Moreover, partial mediating effect of optimism was determined in the relationship between self-control and general procrastination. Self-control has significant indirect effect on general procrastination through optimism, and optimism mediates this relationship.

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### Keywords:<sup>1</sup>

Optimism, self-control, general procrastination, mediating role, process macro

## INTRODUCTION

Daily life is full of enticements challenging our self-control or will power, and such statuses are experienced as a conflict between two enemy forces: While one power calls us to do thing that we believe to be true, the other one encourages us to make what is required by pleasure (Hofmann et al., 2009), and this status is defined with the concept of self-control in the literature. Tangney et al., (2004, p.275) defines the concept of self-control as the ability of the person to invalidate or change his gut reactions, and also as the ability to interrupt the undesired behavior tendencies (such as impulses) and abstain from acting according to them. It was revealed that self-control is related with a wide range of human acts such as love, binge eating, alcohol consumption, getting good grades, commitment in relationships (De Ridder et al., 2018), academic and professional success (Choi et al., 2018), happiness (Wiese, 2018) and satisfaction with life, and emotional well-being (Hofmann et al., 2013). Self-control is the basis in many areas of life, especially for success in education, employment and relationships (Inzlicht et al., 2014).

Procrastination is a status which is related with self-control, and whose prevalence in the population is alleged to be very high (Steel, 2007). Klingsieck (2013, p.26) defines procrastination based on the definition of Steel (2007, p.66) as the voluntary procrastination of an intended and required and/or (personally) significant activity despite expectation towards that the potential negative consequences of procrastination outweigh its positive consequences. In brief terms, procrastination is defined as "the gap between intention and act" (Steel, 2007, p.84). The relation of procrastination with psychological well-being, high stress and poor health (Sirois et al., 2003; Sirois, 2013; Tice and Baumeister, 1997), honesty, self-sufficiency and self-sabotage (van Eerde, 2003), self-respect (Steel, 2007) was revealed with the researchers.

In self-control, the emphasis on the individuals' intended objectives and/or expectations, and in procrastination, the emphasis on the expectation that negative consequence may occur draws attention. The acts of the individuals are greatly affected with their expectations regarding the possible consequences of such acts (Scheier & Carver, 1992). Optimism, addressed as a personality trait (Scheier et al., 1994), is defined as "relatively consistent, generalized outcome expectations regarding the occurrence of positive consequences in significant fields of life" (Scheier and Carver, 1985, p.220). The researches reveal that optimism has significant relations in positive direction with active attempts towards changing the stressful conditions (Segerstrom et

al., 2017), low possibility of falling into depression (Carver et al., 2010), happiness, satisfaction with life, self-respect, cognitive flexibility, and conformance with university life (Dar & Wani, 2017; Demirtaş, 2020; Güler & Emeç, 2006; Hırlak et al., 2017; Nedim Bal & Gülcan, 2014; Sapmaz & Doğan, 2012; Tagay & Şahin Baltacı, 2017).

Within the scope of the current research, it was intended to determine the relationship among self-control, procrastination and optimism tendencies which have significant effects on the individuals' thoughts, emotions and behaviors within the scope of the sample of university students (teacher candidates), and to examine whether tendency for optimism, which is related to the future expectations, has a mediating role in the relationship between self-control and procrastination. Following the presentation of the theoretical frame of the current research, the relationships among the variables were mentioned.

### **Theoretical Background**

Self-control is deemed as the subset of self-regulation (Baumeister et al., 2007). De Ridder et al. (2012) classified the prominent theories related to self-control under the headings of model of reducing impulsivity, hot and cold system approach, and model of self-control's self-regulation power. The model of reducing impulsivity underlined the importance of making long-term decisions rather than short-term consequences, and taking a move, and controlling the instant impulses and reactions (De Ridder et al., 2012 cited from Ainslie, 1975). In the hot and cold system approach regarding self-control, a two-system framework as being cold system (traits of cognition, being strategic, and the center of self-regulation and self-control) and hot system (undermining the efforts of self-control under the control of stimulus) was suggested in order to define self-control or will (Metcalfe and Mischel, 1999). In the model of self-control's power, self-control is related to will power being a limited energy source (Baumeister et al., 2007). One of the main propositions of this model is that undertaking high level of tasks requiring self-control in a specific period will reduce the person's control as his general source will gradually consume (Mylopoulos and Pacherie, 2020, p.87). Within the scope of the current research, the model of self-control's power was addressed as the theoretical basis.

Procrastination, which is deemed as a form of widespread and harmful self-regulation failure that cannot be completely understood (Steel, 2007), arises from a range of complex cognitive, emotional, and motivational factors (Rebetz et al., 2015). Klingsieck (2013) classified the theoretical approaches for defining procrastination as follows: Differential psychology perspective addressing procrastination as a personality trait and focusing on examining the relationship of procrastination with other traits and trait like variables; motivational and deliberate psychology perspective defining the underlying causes of procrastination as covering motivational and/or optional failure and as causing intent-act gap; clinical psychology perspective clinically focusing on the conditions and interferences of procrastination; and situational perspective focusing on the circumstance and thus on the context in which the procrastinator is in the focus of definition. Moreover, Klingsieck (2013) specifies that there are approaches beyond the referred four perspectives covering the differences among behavioral procrastination and procrastination of decision making or procrastination of stimulation, and aversion procrastination, and trying to improve procrastination typologies. Within the scope of the current research, procrastination was addressed as a personality trait.

Two actual approaches trying to define optimism (Peterson, 2000) are imposition manner model addressing how the people define the causes of incidents by habits (Peterson et al., 1995), and optimism tendency related to generalized consequence expectations regarding positive consequences will be obtained in significant living spaces (Scheier and Carver, 1985). The researchers working on optimism tendency, based in the current research, used expectation and value motivation approach and self-regulation model for defining the dynamics underlying optimism and pessimism, and how these dynamics affect human experience (Scheier et al., 1994; Carver and Scheier, 2001). The tendency for optimism (Carver, 2014), being a personality trait, falls in self-regulation when the people ask themselves questions regarding the obstacles before reaching their intended goals such as their belief in reaching their goals in the face of difficulties. If they have such a belief, then they are optimist, and if not, then they are pessimist (Peterson, 2000).

Baumeister and Vohs (2018) emphasized the self-regulation construct in the theoretical infrastructure of self-control, Scheier and Carver (2018) highlighted the same in the theoretical infrastructure of tendency for optimism, and Steel (2007) keynoted the same in the theoretical infrastructure of procrastination. It is observed that the common theoretical basis of three variables addressed within the scope of the current research is self-regulation. Self-regulation is defined as the processes in which the personality consciously changes its own reactions based on standards including the thoughts, emotions, impulses, performance and behaviors

(Baumeister and Vohs, 2018, pp.80-81). The standards referred in the definition of self-regulation are ideas regarding how something has to be or does not have to be, and these cover the aims, norms, values, morality, laws, expectations, and comparable reactions actualized in the past by others or by the person himself (Baumeister and Vohs, 2018, p. 81).

### **Relationships among the Variables**

Below, the relationships among the variables addressed within the scope of the current research are presented.

#### ***Relationships between Self-control and Procrastination***

Self-control focuses on conscious and target-driven behaviors (Baumeister and Alquist, 2009), and it is a subset of self-regulation (Baumeister et al., 2007). Procrastination being related to the gap between intent and act is deemed as self-regulation failure (Steel, 2007). When the individual's self-regulation sources are not sufficient, he has difficulty in transforming his intent to act (Zhao et al., 2021). Many researches reveal that self-control is one of the strong and consistent predictors of procrastination, and that there is a negative relationship between them (Ekşi et al., 2019; Job et al., 2015; Steel, 2007; To et al., 2021; Zhao et al., 2021).

As revealed by the studies on the subject, there is relationship in negative direction between the tendency for procrastination and self-control. In this direction, the hypothesis of the relevant research is presented as follows:

H<sub>1</sub>. There is a relationship in negative direction between self-control and general procrastination in university students.

#### ***Relationships between Self-control and Optimism***

Self-control and optimism are conceptually different; they possibly affect the behavior in different manners and at different stages of behavior, but they both significantly contribute to successful self-regulation (Carver, 2014). Carver (2014, p. 26) concluded that the personality traits of self-control and optimism don't have a common ground, and that they are complementary strong aspects contributing to the estimation of various criteria of social deterioration. In literature, limited number of researches on self-control and optimism reveal that these two constructs have a low level of relationship in positive direction (Carver, 2014; Fischer et al., 2007; In Den Bosch, Meevissen et al., 2014). The hypothesis of the research based on theoretical and empirical background was formed as follows:

H<sub>2</sub>. There is a relationship in negative direction between self-control and optimism in university students.

#### ***Relationships between Optimism and Procrastination***

Optimism is one of the variables of accord in personality being related to procrastination (Milgram and Naaman, 1996, p. 679). In the expectation and value approach related to motivation, being one of the theoretical grounds of tendency to optimism, the target and expectation are two significant conceptual factors (Carver and Scheier, 2001). The importance of the target for the individual determines its value, and the individual's sense of confidence and suspicion regarding the attainability of the target constitutes the dimension of expectation. The people will only act when they have sufficient confidence, and they will pursue making effort in case they preserve sufficient confidence (Carver and Scheier, 2001). When a person develops tendency for procrastination, the critical factor is the person's generalized expectations (Flett et al., 1995, p.163).

In limited number of the researches in the literature searching the relationships between optimism and procrastination, a relationship in negative direction was revealed (e.g., Jackson et al., 2000; Magnano et al., 2015; Murdiana et al., 2020). The hypothesis of the present research based on theoretical and empirical background was formed as follows:

H<sub>3</sub>. There is a relationship in positive direction between optimism and tendency for procrastination in university students.

#### ***Role of Optimism in the Relationship between Self-control and Procrastination***

Theoretical explanations of self-control (Baumeister & Vohs, 2018), optimism (Scheier & Carver, 2018) and procrastination (Steel, 2007) discussed in the current research emphasize self-regulation. A successful self-regulation contributes to adaptation in all areas of life (Hoyle, 2006). Optimism is effective at the point of forming the motivation of individuals for change, and at the point of overcoming difficulties (Miller and Rollnick, 2009). Whereas optimists could promote perseverance in the face of challenges, pessimists may procrastinate when confronted with challenges will be unfavorable (Scheier & Carver, 1999). In the literature, to our knowledge, no study addressing together the variables of self-control, optimism and procrastination related to the process of self-regulation was found. Despite the relationship between self-control and

procrastination was revealed in many studies, it is observed that there are limited researches on defining the causes of the underlying mechanism of this relationship. Based on the theoretical background and studies addressing together the variables of the research, it was considered through cognitive assessments that self-control may be related to optimism in forming the future expectations of the individual, and that such cognitive assessment process may be effective on individuals' procrastination behaviors and thus that tendency for optimism may mediate the relationship between self-control and procrastination. Given these arguments, it is reasonable to hypothesize that optimism is one factor that mediates the relationship between self-control and procrastination. In this context, the relevant hypothesis of the research is as follows:

H4. Optimism plays mediating role in the relationship between self-control and general procrastination in university students.

**CURRENT STUDY**

In this study, it is aimed to investigate the mediating role of optimism in the relationship between self-control and general procrastination in university students. For this purpose, the following hypotheses were tested based on the relationships between the variables:

H1. There is a relationship in negative direction between self-control and general procrastination in university students.

H2. There is a relationship in negative direction between self-control and optimism in university students.

H3. There is a relationship in positive direction between optimism and tendency for procrastination in university students.

H4. Optimism plays mediating role in the relationship between self-control and general procrastination in university students.

**METHOD**

The research model, universe and sample, data collection tools, data collection process and data analysis related to the current study are presented below.

**Research Model**

In this research, mediating role of optimism in the relationship between self-control and general procrastination in university students (teacher candidates) was examined. The research was carried out within the frame of relational screening model. Relational screening model is among the correlational research designs, and it is a research design which is used to determine the relationship among two or more variables (Büyüköztürk et al., 2017, p. 232). In the research, self-control was determined as independent variable, general procrastination was determined as dependent variable, and optimism was determined as mediating variable. In the research, Process Macro software, developed by Hayes (2022), added to SPSS software, and testing the effect of mediating and organization through multiple regression was used in the determination of mediating. In the software, the mediating effect of mediating variable on dependent variable was investigated through the total effect, direct effect and indirect effect scores (Preacher and Hayes, 2008). The mediating effect in the research model was examined by the use of Multiple Mediating Model 4, and in the confidence interval of 95% on the sample of 5000 bootstrap. In this direction, the model given in Figure-1 was designed. In the formation of the model, the way from dependent variable to independent variable was named as "way-c", the way from independent variable to dependent variable over the mediating variable was named as way-c', the way from independent variable to mediating variable was named as way-a, and finally the way from mediating variable to dependent variable was named as way-b (Montoya and Hayes, 2017).

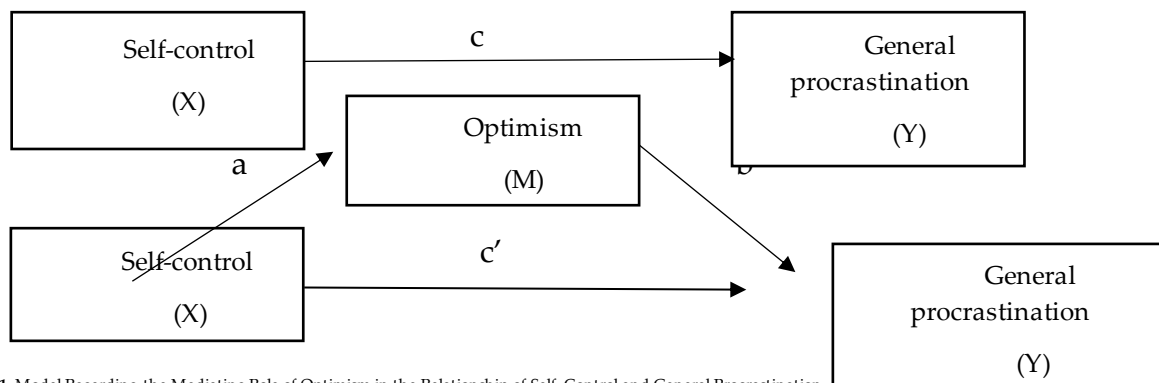


Figure 1. Model Regarding the Mediating Role of Optimism in the Relationship of Self-Control and General Procrastination



As seen in the research model (Figure 1), first the effect of self-control on general procrastination was tested (way-c). And then, the effect of self-control on optimism was tested (way-a). 3. In the third stage, the effect of optimism on general procrastination was tested through the inclusion of self-control and optimism in the regression (way-b). Finally, the effect of self-control on general procrastination by the mediating of optimism was tested (way-c’).

**Study Group**

The undergraduate students studying at a faculty of education of a state university in Turkey formed the study group. In the research, convenience sampling method was administrated. Convenience sampling is a type of nonprobability sampling technique that involves selecting participants based on their easy availability and suitability in terms of factors like willingness, proximity, affordability, and scheduling (Etikan et al., 2016). The data of the research was collected in May during the academic year of 2021-2022. The chart developed by Sekaran (2003, p. 294) was used to determine the size of the sample, and in this direction, it was determined that it was required to reach to 322 individuals at the confidence interval of 95%. The data of 379 individuals was collected for increasing the representative power of the sample. During the arrangement of data, deficient and incorrect measurements determined in the dataset were eliminated, and the analyses were performed with a sample of 327 individuals. The sample’s demographical characteristics, and its frequency and percent values are given in Table 1.

**Table 1. Frequency and Percent Values regarding Gender, Age, Grade, and Department (N=327)**

Demographic Features			Demographic Features		
<b>Gender</b>	<i>f</i>	%	<b>Age</b>	<i>f</i>	%
Female	249	76.1	18	11	3,4
Male	78	23.9	19	32	9,8
Total	327	100	20	74	22,6
<b>Department</b>			21	73	22,3
Classroom teaching	42	12.9	22	66	20,2
Preschool teaching	34	10,4	23	30	9,2
Social sciences teaching	19	5,8	24	11	3,4
Turkish teaching	25	7,6	25	6	1,8
Science teaching	13	4	26	5	1,5
Elementary school mathematics teaching	19	5,8	27-39 between	19	5,8
Special education teaching	22	6,7	Total	327	100
Psychological counseling and guidance	153	46,8	<b>Grade</b>	<i>f</i>	%
Total	327	100	1	73	22,3
			2	99	30,3
			3	78	23,9
			4	77	23,5
			Total	327	100

As seen in Table 1, 249 (76.1%) of the participants were female (76.1%), and 78 (23.9%) of them were male (23.9%). It is observed that the age group of the participants was in the range of 18 and 39. The frequency and percentage of age groups were as follows: 11 individuals were at the age of 18 (3.4%), 32 of them were at the age of 19 (9.8%), 74 of them were at the age of 20 (22.6%), 73 of them were at the age of 21 (22.3%), 66 of them were at the age of 22 (20.2%), 30 of them were at the age of 23 (9.2%), 11 of them were at the age of 24 (3.4%), 6 of them were at the age of 25 (1.8%), 5 of them were at the age of 26 (1.5%), and 19 of them were between 27 and 39 years old (5.8%). 73 of the participants were first grade students (22.3%), 99 of them were second grade students (30.3%), 78 of them were third grade students (23.9%), and 77 of them were fourth grade students (23.5%). The research tried to reach to all the departments in the faculty of education. In this direction, the departments of the participants were as follows: 42 individuals were studying at the department of classroom teaching (12.8%), 34 individuals were studying at the department of preschool teaching (5.8%), 19 individuals were studying at the department of social sciences teaching (5.8%), 25 individuals were studying at the department of Turkish teaching (7.6%), 13 individuals were studying at the department of science teaching (4%), 19 individuals were studying at the department of elementary school mathematics teaching

(5.8%), 22 individuals were studying at the department of special education teaching (6.7%), and 153 individuals were studying at the department of psychological counseling and guidance (46.8%).

### **Data Collection Tools Used in the Study**

#### ***Personal Information Form***

It is the form collecting the study group's gender, age, department, and grade information in order to determine the group's demographic information.

#### ***Optimism and Pessimism Scale Adult Form***

The scale was developed by Çalışkan and Karademir (2023, in publication process) in order to determine the optimism and pessimism levels of adults.

Optimism and pessimism scale adult form was prepared as 5-point Likert scale type with the choices of "completely not suitable", "notification suitable", "slightly suitable", "suitable", and "completely suitable". The scale was formed of 20 items, and of 2 factors measuring optimism and pessimism with 10 items for each. Optimism and pessimism can be used as a subscale, such as an unrelated construct, by taking the total scores separately. If only optimism will be measured in the optimism and pessimism scale adult form, pessimism items are scored reversely, or if the pessimism will be determined, optimism items will be scored reversely, and 20 items are able to be added in the assessment as combined scale. Accordingly, the highest score that can be obtained in the measurement of the optimism factor in the scale is 100, the lowest score is 20. While the scale's Cronbach's alpha reliability coefficient was .92 in the optimism dimension, it was found to be .90 in the pessimism dimension.

To determine optimism within the scope of the study, it was based on the related model, and the pessimism articles were scored reversely. The model's fit indices obtained as the result of DFA performed within the scope of the current study indicated that the scale's single factor construct was at acceptable fit level on the data obtained from the sample group ( $\chi^2=464.03$ ,  $p=0$ ,  $\chi^2/df=2.92$ ,  $RMSEA=.07$ ,  $CFI=.894$ ,  $SRMR=.07$ ). In order to attain better fit values during the DFA operation, associations were performed among the error variances of optimism factor's articles of 1-2 and 6-7, and pessimism factor's articles of 11-12. In the current study, Cronbach's alpha internal consistency coefficient was found to be 0.89.

#### ***Brief Self-Control Scale***

The Brief Self-Control Scale, developed by Tangney, Baumeister, and Boone (2004), measures the tendential self-control processes with respect to thoughts, emotions, impulses, performance regulation and disaccustom, and it consists of 13 items (Zhou et al., 2018). The adaptation of Brief Self-Control Scale to Turkish was performed by Nebioğlu et al. (2012). The Turkish version of Brief Self-Control Scale consists of 9 items. The scale consists of the sub-dimensions of impulsivity and self-discipline. High scores obtained from the scale indicated the high level of self-control. The Brief Self-Control Scale was prepared in 5-point Likert scale type with the choices of "completely opposite", "pretty opposite", "I'm indecisive", "pretty suitable", and "completely suitable". During the scale's adaptation process, the scale's Cronbach's alpha internal reliability coefficient was calculated as .83.

The model's fit indices obtained as the result of DFA performed within the scope of the current study indicated that the scale's single factor construct was at acceptable fit level on the data obtained from the sample group ( $\chi^2=56.394$ ,  $p=0$ ,  $\chi^2/df=2.35$ ,  $RMSEA=.06$ ,  $CFI=.92$ ,  $SRMR=.05$ ). So as to attain better fit values during the DFA operation, associations were performed among the error variances of impulsivity factor's articles of 5-12 and 6-8, and self-discipline factor's articles of 11-12. In the current study, the Cronbach's alpha reliability coefficient of the scale was found to be .70.

#### ***General Procrastination Scale***

It was developed by Çakıcı (2003) to examine the general procrastination behaviors of high school and university students. General Procrastination Scale is a scale consisting of 18 items as 7 being positive and 11 being negative prepared as 5-point Likert scale type with the choices of "definitely doesn't reflect me", "reflecting me very little", "reflecting me a little", "often reflecting me", and "completely reflecting me". The scale has two sub-dimensions determined as effective use of time and procrastination. The high level of score obtained from the scale implies that the individual frequently reflects the general procrastination behaviors, and that he has the tendency for general procrastination. The scale's Cronbach's alpha reliability coefficient was calculated as .91.

The model's fit indices obtained as the result of DFA performed within the scope of the current study indicated that the scale's single factor construct was at acceptable fit level on the data obtained from the sample

group ( $\chi^2=413.425, p=0, \chi^2/df=3.16, RMSEA=.08, CFI=.90, SRMR=.06$ ). In order to attain better fit values during the DFA operation, associations were performed among the error variances of procrastination factor's articles of 11-15, 13-16, and 14-18. In the current study, the Cronbach's alpha reliability coefficient of the scale was found to be 0.91.

**Operation**

The formal ethics approval was granted by the Human Research Ethics Committee of Zonguldak Bülent Ecevit University. (Document's date and no 08.04.2022 – 154489, Protocol No: 102). Following the approval of Ethics Committee, data collection tools to be used in the research were prepared via Google Forms, and transmitted to the participants through UZEM (Distance Education Application and Research Center) system and Whatsapp class groups.

**Data Analyses**

In the research, descriptive statistics of data (mean, standard deviation, kurtosis and skewness coefficients) was calculated. The relationship among the variables was examined by Pearson moments multiplication correlation coefficient. The construct validity of measurement tools used in the study was tested with confirmatory factor analysis. The results of the confirmatory factor analysis performed are interpreted according to model's fit indices (Meydan and Şeşen, 2015, p.37). The good fit and acceptable indices of the fit values used in the research are as follows (the values given the first indicate good fit, the values given afterwards indicate acceptable fit):  $\chi^2$  (CMIN),  $p$  ( $p>.05$ ),  $\chi^2/df$  ( $\chi^2/sd \leq 3; \chi^2/sd \leq 5$ ), RMSEA ( $<.05; <.08$ ), SRMR ( $<.05; <.08$ ), CFI ( $>.95; >.90$ ), (Gürbüz, 2021a, p.38).

In order to test the mediating of predictor relationships among the variables and the optimism variable on the relationship between self-control and general procrastination, analysis was performed by the use of SPSS 21 software pack, and its Process Macro add-on. The significance of indirect effect of optimism variable's mediating on the relationship of self-control and general procrastination was detected by the use of bootstrapping method. The effect of mediating or indirect effect was determined considering the values at a confidence interval (CI) of 95% obtained by the use of percentile method as the result of Bootstrap analysis. According to this, if the bottom (BootLLCI) and top (BootULCI) confidence interval values corresponding to indirect effect value are not covering the value zero (0), the indirect effect is considered as significant, and the occurrence of mediating effect is understood (Gürbüz, 2021b, p.62). SPSS 21 was used during the analysis of data's descriptive data, AMOS 23 was used in DFA, and Process Macro 4.1 software was used for the predictor and mediating relationships.

**FINDINGS**

**Findings of Descriptive Statistics regarding the Scales**

Descriptive statistics regarding the scores obtained from the optimism and pessimism scale adult form, brief self-control scale and general procrastination scale applied on the participants of the research are given in Table 2.

**Table 2. Descriptive Statistics regarding the Scores Obtained from the Scales**

Variables	N	$\bar{x}$	SS	Skewness		Kurtosis	
				Statistics	Std. error	Statistics	Std. error
Optimism	327	3.61	.586	-.188	.135	-.230	.269
Self-control	327	3.34	.548	.068	.135	-.256	.269
General procrastination	327	2.14	.604	.344	.135	-.796	.269

Whether the data show normal distribution or not was checked by the skewness and kurtosis values. In the data analysis, the skewness coefficient being between +1 and -1 is construed as that the test score distributions don't excessively deviate from the normal (Büyüköztürk, 2005, p.40). At this point, the findings obtained from the current research may be interpreted as that all the measurements show normal distribution. The values obtained by the results of skewness and kurtosis tests were within the determined limits, and parametric tests were used as they meet the assumption of normality.



**Findings regarding the Mediating Effect**

**Table 3. Descriptive statistics and correlation matrix of all variables.**

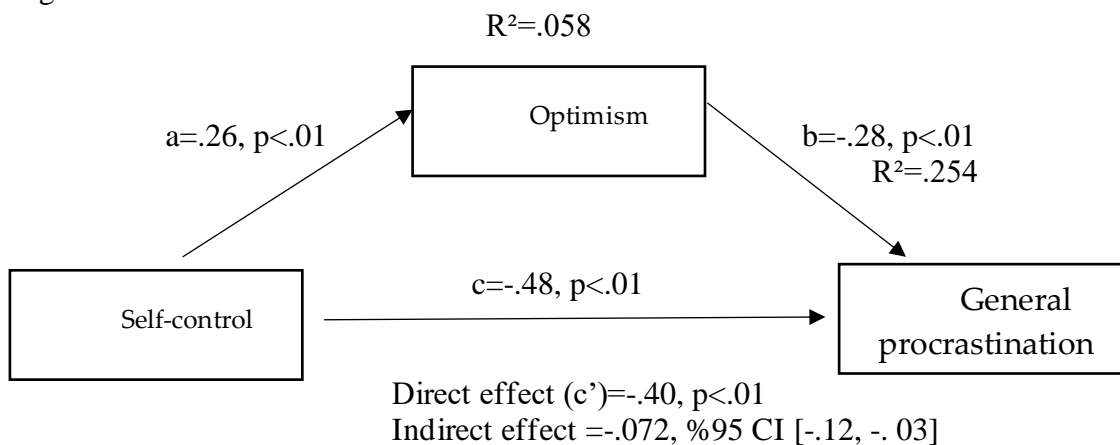
Variables	Optimism	Self-control	General procrastination	$\bar{x}$	S
<b>Optimism</b>	1	.24	-.36	3.62	.57
<b>Self-control</b>	.24	1	-.43	3.35	.55
<b>General procrastination</b>	-.36	-.43	1	2.14	.60

p<.01

As shown in Table 4, it was observed that there was a statistically significant low level of relationship in positive direction between optimism and self-control (r=.24), that there was a statistically significant medium level of relationship in negative direction between optimism and general procrastination (r= -.36), and that there was a statistically significant medium level of relationship in negative direction between general procrastination and self-control (r= -.43). The correlation coefficients among the variables not being above .80 indicate that there is no multicollinearity problem (Büyüköztürk, 2013).

Following the examination of relationships among optimism, self-control and general procrastination, the in the determination of mediating effect of optimism on the relationship between the university students' self-controls and tendencies for general procrastination, initially the effect of self-control on general procrastination was analyzed. The research model's findings are given in Figure 2.

Figure 2.



**Figure 2.** Analysis Results of the Research Model

Note: The non-standardized beta coefficients were reported. CI=Confidence interval. R<sup>2</sup> values indicate the revealed variance.

The research model's findings shown in Figure 2 are interpreted below, respectively. Initially, the table regarding the effects of self-control on general procrastination, thus the findings regarding the H1 hypothesis was provided.

**Table 4. The effect of self-control on general procrastination**

Independent variable	Dependent variable: General procrastination				Model Summary			
	B	S.E.	$\beta$	t	LLCI	ULCI	R <sup>2</sup>	F
<b>Constant</b>	3.74	.19		19.96**	3.37	4.11		
<b>Self-control</b>	-.48	.06	-.43	-8.61**	-.58	-.37	.19**	74.01

\*p<.05 \*\* p<.01

As the result of the analysis performed, it was noticed that self-control significantly affects the tendency for general procrastination in negative direction (b=-.475, %95CI [-.5837, -.3665], t=-8.6073, p<.001). The significance of non-standardized beta value (b) was understood from the fact that the p value in Table 5 was not smaller than .01, and that the values of confidence interval (CI) did not cover the value zero (0). Self-control defines about 19% (R<sup>2</sup>=.185) of the change in tendency for general procrastination. In the direction of the findings, the hypothesis of "H1. There is a relationship in negative direction between self-control and general procrastination in university students." was supported.



In order to test the second hypothesis of the research, the effect of self-control on optimism was analyzed. The findings are presented in Table 5.

**Table 5. The effect of self-control on optimism**

Independent variable	Dependent variable: General procrastination				Model Summary			
	B	S.H.	$\beta$	t	LLCI	ULCI	R <sup>2</sup>	F
Constant	2.75	.19		14.10**	2.37	3.13	.06**	20.11
Optimism	.26	.06	.24	4.48**	.14	.37		

\*p<.05 \*\* p<.01

As the result of the analyses performed, it was figured out that self-control was significantly affecting optimism in positive direction (b=.258, %95CI [.144, .371], t=4.485, p<.001). The significance of non-standardized beta value (b) was understood from the fact that the p value in Table 5 was not smaller than .01, and that the values of confidence interval (CI) did not cover the value zero (0). Self-control defines about 6% (R<sup>2</sup>=.058) of the change in optimism. In the direction of the findings, the hypothesis of “H2. There is a relationship in negative direction between self-control and optimism in university students.” was supported.

To test the third hypothesis of the research, the effects of optimism and self-control variable on general procrastination, briefly way-b was analyzed. The findings were presented in Table 6.

**Table 6. The effects of optimism and self-control variable on general procrastination**

Independent variable	Dependent variable: General procrastination				Model Summary			
	B	S.H.	$\beta$	t	LLCI	ULCI	R <sup>2</sup>	F
Constant	4.5	.23		19.73**	2.37	3.13	.25**	55.0
Optimism	-.27	.05	-.27	-5.43**	-.38	-.18		

\*p<.05 \*\* p<.01

As observed in Table 6, according to the results of analysis regarding the mutual effects of optimism and way-b and self-control variable’s way-c’ on tendency for general procrastination being the result variable, it was monitored that optimism was significantly affecting the tendency for general procrastination in negative direction (b=-.574, %95CI [-3771, -1764], t=-5.4256, p<.001). Similarly, it was detected that self-control significantly affects the tendency for general procrastination in negative direction (b=-.4037, %95CI [-.5110, -.2964], t=-7.4005, p<.001). Self-control and optimism define 25% (R<sup>2</sup>=.253) of the change in tendency for general procrastination. In the direction of the findings, the hypothesis of “H3. There is a relationship in positive direction between optimism and tendency for procrastination in university students.” was supported.

Finally, the results of regression analysis regarding the mediating effect were presented in Table 7.

**Table 7. The mediating role of optimism in the relationship of self-control and general procrastination**

Antecedent X (Self-control)	Consequent					
	M (Optimism)			Y (General procrastination)		
	a	b	S.E	c’	b	S.E
M (Optimism)	-	-	-	b	-.28***	.051
Constant	im	2.755***	.195	iy	4.501***	.228
		R <sup>2</sup> =.058			R <sup>2</sup> =.254	
		F(1;325)=20.115; p<.01			F(2;324)=55.002; p<.01	

\*p<.05, \*\* p<.01, \*\*\* p<.001; S. E: Standard Error. The non-standardized beta coefficients (b) were reported.

As observed in Table 8, it was figured out that the effect of self-control on general procrastination was significant, and thus that the optimism mediating the relationship between self-control and tendency for general procrastination (b=-.072, 95% [-.1217, -.0319]). Bootstrap bottom and top confidence interval values obtained by the percentile method doesn’t cover the value zero (0). In the light of these results, the research’s hypothesis of “H4. Optimism plays mediating role in the

relationship between self-control and general procrastination in university students." was supported. During the interpretation of the size of effect, in general, it is interpreted as low effect if it is close to .01, it is interpreted as medium effect if it is close to .09, and it is interpreted as high effect if it is close to .25 (Gürbüz, 2021b, p.70). In this case, it was observed that the mediating effect in the tested model was close to the medium value.

## RESULT, DISCUSSION AND SUGGESTIONS

In this study, the mediating role of optimism in the relationship between the university students' self-control levels and tendencies for general procrastination was examined. Moreover, the relationships between self-control and procrastination, self-control and optimism, and optimism and general procrastination were investigated. For this purpose, four hypotheses based on the relevant literature were tested and supported. Below, the results of the research will be discussed, respectively.

In the research, the first hypothesis expressed as "There is a relationship in negative direction between self-control and general procrastination in university students (H1)" was supported. In other words, as the university students' self-control levels increase, their tendencies for general procrastination decrease. In the tendency for procrastination (Steel, 2007), which is addressed as a harmful self-regulation failure and namely which is relevant to the gap between intent and act, it is suggested that the individuals have difficulty in transforming their intents to act due to insufficiency of their self-regulation sources (Zhao et al., 2021). Self-control is relevant to the capacity of regulating behavior, thought and emotions for changing the dominant reactions of the personality (De Ridder et al., 2012). As the result of a longitudinal study in which the university students' self-controls and academic performances were followed, it was concluded that the students facing high self-regulation demands display better self-regulation, and thus that show less tendency for procrastination (Job et al., 2015). Steel (2007), by his meta-analysis study in which the possible causes and effects were examined, revealed that self-control was one of the strong and consistent predictors of procrastination. Insufficiency in ensuring the self-control is the status of individuals' action beyond the targets they determine, and individuals' inability to adjust the behaviors according to their targets (Fujita, 2011). In different researches actualized with university students, the negative relationship of procrastination with self-control was revealed (To et al., 2021; Zhao et al., 2021). Similarly, this finding regarding the relationship of self-control and procrastination obtained as the result of the research shows consistency with the results of numerous research results performed on this subject.

In the current study, the research's second hypothesis expressed as "There is a relationship in negative direction between self-control and optimism in university students (H2)" was supported. As the university students' self-control levels increase, their optimism levels also increase. Self-regulation is used in theoretical explanations of self-control (Baumeister and Vohs, 2018) and tendency for optimism (Scheier and Carver, 2018). The standards included in the definition of self-regulation defined as processes in which the personality consciously changes its own reactions based on the standards also cover the expectations (Baumeister and Vohs, 2018), and tendency for optimism shapes the individuals' positive or negative expectations in the face of incidents and circumstances they will encounter. Thinking about the future generally covers preparation for action so as to obtain the desired consequences (Baumeister et al., 2016, p.4). The optimist people form expectations that can come to action and prospective desires as their motivation mechanisms in order to attain their goals (Oriol et al., 2020). Carver (2014) concluded that self-control and optimism contribute to successful self-regulation, but that they do not have a common ground, and that they were complementary strong aspects contributing to the estimation of various criteria of social deterioration, and resolved that the relationship between the two variables was a relationship of low level. In a similar vein, it was also noticed in this research that the relationship between self-control and optimism was in positive direction and at low level. Fischer et al. (2007), as the result of their research, pointed out that research participants with consumed self-regulation sources exhibit less optimist comprehension and lower sense of self-control regarding their own abilities, and that they were less optimist regarding their futures. In their research, In Den Bosch-Meevissen et al. (2014) assigned the research participants the task of lifting weight. As the result of the research, they highlighted that optimism caused persistence in the task of lifting in the participants with high tendency for optimism. The finding obtained as the result of the current research tallies with the results of limited number of researches on the subject in literature.

The research's third hypothesis expressed as "There is a relationship in positive direction between optimism and tendency for procrastination in university students (H3)" was also supported. According to this result, it was detected that the tendency for general procrastination may decrease by the increase of tendency for optimism. Flett et al. (1995) assert that the generalized expectations of an individual are of critical importance when his tendency for procrastination is improved. In optimism (Scheier and Carver, 1985), being relevant to the individuals' generalized conclusion expectations for the future, the individuals develop sense of confidence and suspicion regarding the attainability of their prudential goals, and the overweighting of individuals' sense of trust regarding the attainability of their prudential goals will cause them to take steps (Carver and Scheier, 2001). Jackson et al. (2000), as the result of their research, found out that more optimist university students act different than their less optimist peers, and that they were less inclined to postpone their duties or abstain from them, and that their possibility of perseverance in the face of persuader duties was higher. As the result of the research, in which the tendency for optimism and decision styles in the sample of adolescents was examined, a negative relationship between optimism and procrastination was revealed (Magnano et al., 2015). As the result of the research, in which the relationships between optimism and procrastination in university students being in the process dissertation preparation were investigated, it was detected that there was a negative relationship between optimism and procrastination (Murdiana et al., 2020). Limited number of researches on the subject in the literature shows consistency with the findings of the current research. When the individuals have the expectation of facing good things in the future, namely when they have tendency for optimism, their tendency for procrastination decreases.

The research's fourth and final hypothesis was expressed as "Optimism plays mediating role in the relationship between self-control and general procrastination in university students (H4)", and this hypothesis was also supported as the result of the analyses performed. In other words, it was concluded that optimism has partial mediating role in the relationship of self-control and general procrastination among the university students. In the research model, the increase of self-control level causes the increase of tendency for optimism, and the increase of tendency for optimism causes the increase of general optimism level of university students. In the literature, no study addressing together the three variables examined within the scope of the current research was found. Thus, the result of the research was discussed in terms of the self-regulation construct being the common theoretical basis of all three variables. Self-regulation expresses the individual's ability to control his own behaviors, emotions and thoughts (Zhao et al., 2021). Optimism, regarding the individuals' future expectations (Scheier and Carver, 2018), in the relationship between self-control being relevant to the capacity of regulating the behaviors, thoughts and emotions in order to change the dominant reactions of personality (De Ridder et al., 2012), and procrastination (Steel, 2007) which arises from a range of complex cognitive, emotional and motivational factors (Rebetez et al., 2015) and being emphasized as a form of self-regulation failure, falls under self-regulation at the point of attainment of the goals they determine (Peterson, 2000). Behavior feedback control processes included in the self-regulation dimension of optimism, and the concept of goal included in the expectation value approach dimension regarding motivation emphasizes the sense of confidence and suspicion (Carver and Scheier, 2001). Optimism is relevant to preserving the goal in the face of difficulties or obstacles (Segerstrom and Nes, 2006).

The individuals will only act when they have sufficient confidence regarding the attainability of the goal, and they will pursue making effort in case they preserve sufficient confidence (Carver and Scheier, 2001). The optimists expect good results even if things are difficult; the individuals having confidence in final success continues to try even if the course of events is hard, but the distrusters try to abstain from problems, and they are able to direct to distracting things that don't assist the solution of the problem and they are even sometimes able to abandon from trying (Carver et al., 2010). The optimists' insistent tendency for running after their goals, and their ability to overcome the stressors actively might make them turn the short-term tendencies to long-term sources (Carver et al., 2010).

It may be deduced that the tendency for optimism of university students with high self-control will be at higher level, and this will cause them to have lower level of tendency for general procrastination. As the university students having self-confidence regarding the attainability of the goal in a case requiring self-control, and having positive expectations regarding the results continue to make effort for the results, they will show less tendency for procrastination.

This study shows the interactions among self-control, general procrastination, and optimism. It is important in terms of being the first study addressing the three variables being important for the individuals'

physical and psychological well-being. In the research, it was concluded that the relationship of self-control and optimism with general procrastination was in negative direction, and that the relationship of self-control and optimism was in positive direction. In addition, it was figured out that optimism was performing partial mediating in the relationship between self-control and general procrastination. This result indicates that optimism is one of the factors explaining the relationship between self-control and general procrastination. Therefore, it can be concluded that designing educational and intervention programs aimed at enhancing self-control and optimism would contribute to reducing the tendency towards general procrastination. Consequently, this situation could play a role in improving individuals' psychological well-being. The significance of this study lies in its examination of the relationships between self-control, general procrastination, and optimism, which could serve as a valuable resource for future research in this field. Further studies, by delving deeper into these relationships, can provide further insights into specific factors and mechanisms.

The obtained research data from the university students studying at the same university and the use of convenience sampling method are among the constraints of the research. In future researches, the data may be collected at different times and from different sources, and longitudinal researches may be designed. Despite the specified constraints, the current research is the first study testing the relationships among self-control, general procrastination, and optimism. It is considered that the performance of more researches on the subject in the future, and the actualization of intercultural studies will contribute to literature. Additionally, it is also anticipated that studies to be actualized through combined method will be able to reveal in more detail the relationships among the three variables.

#### **Declarations**

#### **Conflict of Interest**

No potential conflicts of interest were disclosed by the author(s) with respect to the research, authorship, or publication of this article.

#### **Ethics Approval**

The formal ethics approval was granted by the Human Research Ethics Committee of Zonguldak Bülent Ecevit University. We conducted the study in accordance with the Helsinki Declaration in 1975.

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#### **Research and Publication Ethics Statement**

The study was approved by the research team's university ethics committee of the Zonguldak Bülent Ecevit University (Approval Number/ID: 04/2022 154489). Hereby, we as the authors consciously assure that for the manuscript "

" the following is fulfilled:

- This material is the authors' own original work, which has not been previously published elsewhere.
- The paper reflects the authors' own research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

#### **Contribution Rates of Authors to the Article**

The authors provide equal contribution to this work.

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