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Procrastination, Self-Esteem, Academic Performance, and Well-Being: A Moderated Mediation Model

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Procrastination, Self-esteem, Academic Performance, and Well-being: A Moderated Mediation Model

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Abstract

The current study attempts to examine integrated effects of procrastination, self-esteem, and academic performance on well-being in a sample of Turkish undergraduate students (N = 348). Results confirm prior evidence suggesting that procrastination and self-esteem were important predictors of well-being. Results also indicated that both procrastination and academic performance have direct and interactive effects on self-esteem. Self-esteem mediated the relationships between procrastination and well-being. Furthermore, the indirect effect of procrastination on well-being via mediation of self-esteem may vary depending on academic performance. Findings were discussed in terms of related literature and further suggestions have been made for future studies.

Keywords: procrastination, self-esteem, academic performance, well-being, moderated mediation model

Dilación, Autoestima, Rendimiento Académico y Bienestar: Un Modelo Mediador Moderado

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Resumen

El presente estudio intenta examinar los efectos integrados de la dilación, la autoestima y el rendimiento académico en el bienestar en una muestra de estudiantes turcos de pregrado (N=348). Los resultados confirman la evidencia previa que sugiere que la dilación y la autoestima son predictores importantes del bienestar. Los resultados también indicaron que tanto la dilación como el rendimiento académico tienen efectos directos e interactivos sobre la autoestima. La autoestima media las relaciones entre la dilación y el bienestar. Además, el efecto indirecto de la dilación en el bienestar a través de la mediación de la autoestima puede variar dependiendo del rendimiento académico. Los hallazgos se discuten en relación a la literatura relacionada y se hacen sugerencias para estudios futuros.

Palabras clave: procrastinación, autoestima, logro académico, bienestar, modelo de mediación moderada.

Procrastination is an important subject matter and has received a considerable amount of interest from researchers over the past decades. It has been defined as self-regulatory failure (Steel, 2007), often results in undesirable outcomes including poor performance and well-being. There is growing evidence suggesting that procrastination is a common problem among students and non-student population. Harriott and Ferrari (1996) reported 20 % of adults engage in procrastination. In academic settings, previous studies reported 23-52% of undergraduate students suffer from procrastination (Balkis & Duru 2009; Özer, Demir, & Ferrari, 2009).

Apart from the prevalence of procrastination, the frequency of procrastination experienced can influence students internally and externally. Low academic achievement can be considered as an external consequence of procrastination for students. Jackson, Weiss, Lundquist and Hooper (2003) stated that procrastination may disrupt academic performance in several ways (see Jackson et al., 2003 for reviews). In existing literature, three meta-analyses were conducted to test the relationship between procrastination and academic performance (Kim & Seo, 2015; Richardson, Abraham, & Bond, 2012; Steel, 2007). These studies reported that procrastinating students are more likely to perform poorly.

As for the internal effects of procrastination on students, previous findings indicated that procrastinating students feel *anxiety* (Fernie, McKenzie, Nikčević, Caselli, G., & Spada, 2016; Gagnon, Dionne, & Pychyl, 2016; Milgram & Toubiana, 1999), *depression* (Fernie et al., 2016; Gagnon et al., 2016; Özer, O'Callaghan, Bokszczanin, Ederer, , & Essau, 2014; Steel, 2007; van Eerde, 2003), *stress* (Sriois & Tosti, 2012; Stead, Shanahan, & Neufeld, 2010; Tice & Baumeister, 1997), and *dissatisfaction with life* (Grunschel, Schwinger, Steinmayr, & Fries, 2016; Hinsch & Sheldon, 2013; Steel, 2010). It seems reasonable to assume that procrastination leads to a lifestyle rife with complications that decrease the overall quality of life and the college experience, and adversely impact the student's well-being. However, many questions regarding when and how procrastination affects well-being still remain unanswered. It is because all studies above have focused on the direct effect of procrastination on students' well-being. Thus, in order to answer when and how the

procrastination affects well-being, it is better to examine the integrated effects of intervening mechanisms and possible variables related to procrastination and well-being. In this study, the integrated effects of self-esteem and academic achievement which are considered to be related with procrastination and well-being will be tested. Previous studies reported that procrastination predicts self-esteem and self-esteem predicts psychological adjustment and well-being (Bajaj, Gupta, & Pande, 2016; Duru & Balkis, 2014; Ferrari, 2000; Lin, 2015). That is to say, as the level of procrastination increases, self-esteem decreases and this negatively affects the well-being. Moreover, there are studies which highlighted the mediating and protective role of self-esteem apart from its direct effect on mental health (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004; Smokowski, Guo, Rose, Evans, Cotter, & Bacallao, 2014; Sowislo & Orth, 2013). The common finding of these studies is that the direct, mediation, and the integrated effect of self-esteem on mental health is important. In a similar way, research indicated that procrastination predicts academic performance and academic performance predicts academic life satisfaction (Balkis, 2013; Kim & Seo, 2015). In other words, as the procrastination increases, academic performance worsens and this negatively affects the academic life satisfaction. In this sense, the effect of procrastination on students' well-being is supposed to vary according to the self-esteem and academic achievement of students. Put differently, self-esteem may have a mediator role on the relation of procrastination and well-being and this role may vary depending on the academic achievement. Similarly, academic achievement might have a mediator role on the relation of procrastination and well-being and this may vary according to the level of self-esteem.

Procrastination and Self-Esteem

In literature, it is highlighted that procrastination plays a protective role for self-esteem in case of a probable failure (Burka & Yuen, 2008, Covington, 2007; Duru & Balkis, 2014; Ferrari, Johnson, & McCown, 1995). According to Burka and Yuen (2008), procrastinators believe that their performance is a reflection of their self-worth. Thus, in case of a potential failure, they think that they are unsuccessful not only for doing the current task but also as an

individual. In this case they refrain from doing that task in order to protect their self-worth. Similarly Thompson (1999) also indicated that individuals who are doubtful about their abilities to complete a task successfully try to protect their self-esteem by procrastinating. Much research has pointed out the relation of procrastination with self-esteem (Balkis & Duru, 2012; Ferrari & Diaz-Morales, 2007; Park & Sperling, 2012; Pychyl, Coplan, & Reid, 2002). Briefly, high level of procrastination is supposed to be related with low level of self-esteem.

Self-Esteem and Academic Achievement

Success and failure in academic life have both major impacts on the way a student perceives himself or herself (Suk Wai Wong & Watkins, 2001). It is expected that students who experience repeated academic failure are likely to develop negative feelings about themselves, on the contrary, those who encounter success tend to develop positive views of themselves. It has often been suggested that academic achievement is closely related to self-esteem (Osborne, 1997; Pullmann & Allik, 2008; Suk Wai Wong & Watkins, 2001; Stupniskyet, Renaud, Perry, Ruthig, Haynes, & Clifton, 2007; Whitesell, Mitchell, & Spicer, 2009), nevertheless, considering the literature, this relationship is more complicated than it is thought to be. Some researchers asserted that self-esteem affects academic achievement (Chapman, 1988; Hansford & Hattie, 1982; Marsh, Byrne, & Shavelson, 1988), however some others claim it is affected by academic achievement (Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Baumeister, Campbell, Krueger, & Vohs, 2003; Bowles, 1999; Filozof, Albertin, Jones, Steme, Myers, & McDermott, 1998; Hoge, Smit, & Crist, 1995). It can be concluded that while self-esteem affects academic achievement, it is affected by academic achievement as well.

Self-Esteem and Well-Being

Rosenberg (1965) conceptualized self-esteem as a positive or negative attitude towards self which is developed from the total evaluation of self among various affect areas. Pyszczynski et al. (2004) noted that individuals with low level of self-esteem have also low level of optimism and

motivation, nonetheless have high level of depression, anxiety and negative feelings. Similarly, Leary (2005) reported that in comparison with low self-esteem individuals, people with high level of self-esteem are less likely to be vulnerable to depression, anxiety, embarrassment, shame, guiltiness, hurt, shyness, and upset. In addition, it is found that self-esteem is associated with indexes of well-being, including low depression (Sowislo & Urth, 2013), satisfaction with life (Diener & Diener, 2009), positive affect (Wood, Heimpel, & Michela, 2003), hope (Symister & Friend, 2003), and optimism (Makikangas, Kinnunen, & Feldt, 2004). Briefly, research and theoretical framework mentioned above pointed out that the level of self-esteem has an important role on the psychological adjustment and mental health of an individual. In other words, as self-esteem increases, psychological adjustment and well-being increase as well.

The Current Study

A great deal of research has emphasized the negative effect of procrastination on well-being of students (e.g. Fernie et al., 2016; Gagnon et al., 2016; Sriois & Tosti, 2012; Steel, 2010). However, these studies are lack of a clear explanation about the nature of the process in which procrastination affects the well-being. In other words, the question of under which case and conditions does the procrastination affects students' well-being more, has not been answered adequately. One way of answering this question might be to examine the integrated effects of variables which are related to procrastination and well-being. As mentioned before, one of the variables associated with both procrastination and well-being is self-esteem. Explanations about the relationship between procrastination and self-esteem are such that procrastination has a protective role for self-esteem in case of a failure (e.g. Ferrari et al., 1995). Apart from its protective role, procrastination is also supposed to have a negative impact on self-esteem, and academic achievement might play an important role in this process. This is because, as mentioned before, many researchers stated that procrastination interrupts students' academic performance (e.g. Kim & Seo, 2015). Moreover, plenty of research highlighted that academic achievement of students is an important resource that feeds their self-esteem (e.g. Alves-

Martins et al., 2002; Baumeister et al., 2003). Therefore, it is supposed that high level of procrastination decreases the level of academic achievement and this affects student's self-esteem negatively. Furthermore, in many studies, it is indicated that low level of procrastination is associated with high level of self-esteem and academic achievement and performance (Steel, 2007). Thus, the relationship between procrastination and self-esteem might vary depending on low or high academic performance.

In addition to the relations of procrastination, self-esteem and academic performance, these relations might be associated with students' well-being. For example, besides the adverse impact of procrastination on well-being, many studies suggested self-esteem as an important variable which effects well-being positively (Diener & Diener, 2009; Pyszczynski et al., 2004; Wood et al., 2003). Hence, high level of procrastination might decrease self-esteem and in turn affects student's well-being negatively. Self-esteem might have a mediator role in this relationship. Moreover, considering the relation of self-esteem with academic achievement and performance (e.g., Stupnisky et al., 2007; Whitesell et al., 2009), the mediator effect of self-esteem is supposed to vary according to academic performance. In this sense, the current study has aimed to examine the integrated effects of procrastination, self-esteem and academic achievement on students' well-being. The hypotheses of the study have been determined as below:

- 1) Procrastination and academic performance will interact to predict self-esteem. The negative relationship between procrastination and self-esteem will be stronger when the level of academic performance is low (versus high)
- 2) Self-esteem will mediate the relationship between procrastination and well-being. However, this indirect effect will be conditional on the academic performance and will be stronger when the level of academic performance is low (Figure 1).

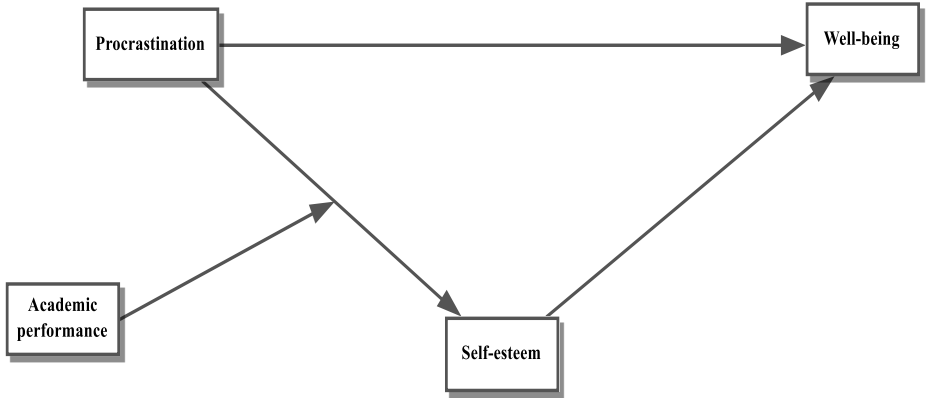


Figure 1. Conceptual model of effect of procrastination on well-being

Method

Participants

Sample consisted of 348 undergraduate students (73% of females) enrolling in faculty of education within a public university located in an urban city in Turkey. Students' age ranged between 19 and 26 ($M = 21.30$, $SD = 1.15$). All participants have same ethnic background. All students were invited to participate in the study during their class time. A paper-pencil survey, which included questions about demographic variables and data collection instruments described below, was distributed to the students who accepted to participate in the study.

Measures

Tuckman Procrastination Scale-Turkish Version (TPS-TV). The TPS-TV is a 14- items self-report measure of procrastination (Özer, Saçkes, & Tuckman,

2013). Participants indicated the extent to which they agreed with statements such as ‘I needlessly delay finishing jobs, even when they’re important’. The statements are rated on a 5- point Likert scale (*1 =strongly agree, 5 = strongly disagree*). Özer et al. (2013) reported that the internal consistency coefficient for the TPS-TV was $\alpha = .90$ and four weeks test-retest reliability was found as $r = .80$. For the current sample, the internal consistency coefficient for the TPS-TV was $\alpha = .84$.

Rosenberg Self-Esteem Scale (RSES). The RSES is a 10- items self-report measure of self-esteem (e.g., “*I wish I could have more respect for myself*”), with rating on a 4 point Likert scale ranging from strongly agree (1) to strongly disagree (4) (Rosenberg, 1965). Çuhadaroğlu (1986) examined the psychometric characteristics of Rosenberg Self-Esteem Scale for Turkish sample. The internal coefficient was found to be .71. Test-retest reliability was found as $r = .75$ (Çuhadaroğlu, 1986). For the current sample, the internal coefficient was $\alpha = .83$.

Well –Being. Well-Being was determined by two scales those were Academic Life Satisfaction Scale and PANAS.

Academic Life Satisfaction (ALS). Academic life satisfaction of the participants was assessed by Academic Satisfaction Scale (Schmitt, Oswald, Friede, Imus, & Merrit, 2008). The Academic Satisfaction Scale consists of five items. A sample item is: “I’m happy with the amount I learn in my classes”. Students indicated the level of agreement with each item, which were scored on a 5-point Likert response scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Balkis (2013) examined the psychometric characteristics of ALS and reported that internal consistency coefficient for the ALS was $\alpha = .86$. For the current sample, the internal coefficient was $\alpha = .89$.

Positive and Negative Affect Schedule (PANAS).The emotional state of participants was assessed by PANAS (Watson, Clark, & Tellegen, 1988). The PANAS includes 20 items assessing positive affectivity (10 items) and negative affectivity (10 items), rated on a 5-point scale. Gençöz (2000) examined the psychometric characteristics of PANAS for Turkish population, and reported that the internal consistency coefficient for the PA was $\alpha = .80$, for the NA was $\alpha = .85$. For the current sample, internal consistency coefficient for the PA was $\alpha = .82$, for the NA was $\alpha = .83$.

Academic Performance. Academic performance was measured by using students' cumulative grade point averages (GPA) that the students had achieved up to previous semester before the questionnaire was filled out.

Data analysis

Data was analyzed by SPSS 22. The relationships between variables were examined by utilizing Pearson product moment correlation analysis. The proposed theoretical model (Figure 1) was tested via moderated mediation analysis, also known as conditional indirect process modeling, by using the PROCESS macro (Model 7) developed by Hayes (2013) for SPSS. Four models were constructed to examine whether (1) the effect of procrastination on self-esteem depends on levels of academic performance, (2) the effect of procrastination on well-being via self-esteem depends on levels of academic performance, (3) the effect of procrastination on academic performance depends on levels of self-esteem, (4) the effect of procrastination on well-being via academic performance depends on levels of self-esteem. This approach enables the examination of direct and indirect effects of an independent variable on a dependent variable via a mediator, as well as conditional effects moderating these relationships; therefore, all two hypotheses were tested simultaneously. Bias corrected bootstrap confidence intervals were generated for conditional indirect effects at the low, average and high level based on 10.000 bootstrap samples, as this approach has been recommended for examining moderated mediation models (Hayes, 2013). Point estimates were considered significant if the 95% confidence interval did not contain zero.

Results

Descriptive statistics and correlation analyses

Table 1 presents results of these correlational analyses and descriptive statistics. In order to examine whether procrastination was related to self-esteem, academic performance and well-being, first of all, the relations between procrastination, self-esteem, academic performance and well-being were examined by utilizing a Pearson product moment correlational analysis.

Results showed all variables were statistically and significantly related to each other.

Table 1
Bivariate correlations and descriptive statistics

| | <i>M</i> | <i>SD</i> | <i>Skewness</i> | <i>Kurtosis</i> | <i>Range</i> | 1 | 2 | 3 | 4 |
|------------------------|----------|-----------|-----------------|-----------------|--------------|---|---------|---------|---------|
| 1-Procrastination | 35.78 | 8.75 | .014 | -.322 | 14-56 | - | -.357** | -.396** | -.373** |
| 2-Self-esteem | 33.00 | 4.79 | -.460 | -.654 | 20-40 | - | - | .511** | .320** |
| 3-Well-being | 30.20 | 11.47 | -.269 | .040 | -6 -62 | - | - | - | .244** |
| 4-Academic performance | 2.93 | .33 | .263 | -.256 | 2.10-3.90 | - | - | - | - |

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

Moderated mediation analysis

Both hypotheses were tested by as a single instance of moderated mediation analysis by using Hayes’s (2013) PROCESS macro (Model 7) (Figure 1). Moderated mediation analysis was established whether an indirect effect occur from procrastination to well-being via the mediation of self-esteem, and if that effect is conditional on the moderation of academic performance. Table 2 provides the detailed results of moderated mediation analyses.

Results showed that both procrastination and academic performance had significant direct effect on self-esteem, and their interaction effect on self-esteem was statistically significant as well ($\Delta R^2 = .024$, $p < .01$). Results also indicated that the relationship between procrastination and self-esteem is stronger when the level of academic performance is low ($t = -5.38$, $p < .001$) rather than it is high ($t = 1.47$, $p > .05$). Thus, Hypothesis 1 was supported; procrastination and academic performance interacts to predict self-esteem. Negative relationship between procrastination and self-esteem is stronger when the level of academic performance is also low. Figure 2 illustrates the interaction at high (+1SD) and low (-1SD) levels of procrastination and self-esteem.

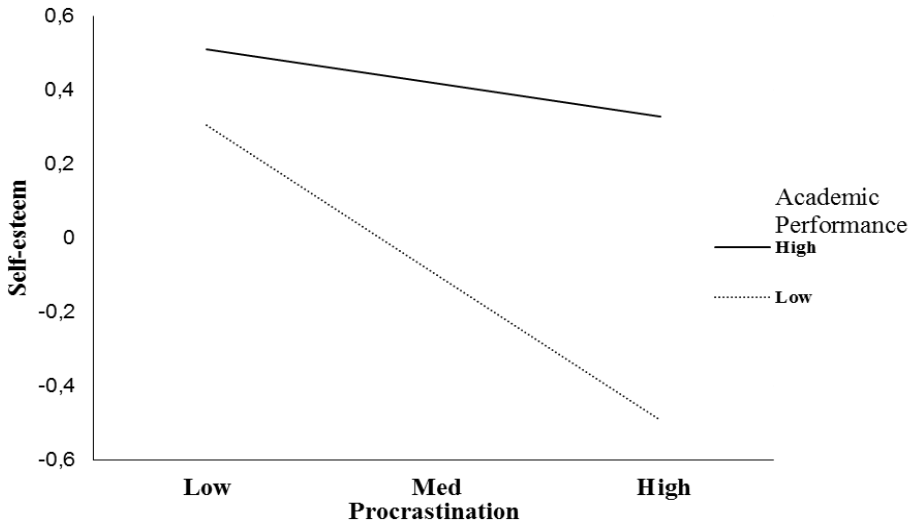


Figure 2. Interaction effect of procrastination and academic performance on self-esteem

Finally, results noticed that self-esteem had a direct effect on well-being. Then, whether a significance indirect effect of procrastination on well-being by self-esteem depends on academic performance was tested by using bootstrapping ($N = 10,000$). Results indicated that the indirect effect of procrastination on well-being via the mediation of self-esteem is stronger when the level of academic performance are low ($ab = -.21, SE = .050, 95\%$ confidence interval $[CI] = -.32, -.12$) rather than it is high ($ab = .04, SE = .035, 95\%$ confidence interval $[CI] = -.12, .013$). Thus, Hypothesis 2 was supported; Self-esteem mediates the relationship between procrastination and well-being. However, this indirect effect is conditional on the academic performance and is stronger when the level of academic performance is low.

Table 2

Moderated mediation statistics

| Model 1 | | Dependent variable: Self-esteem | | |
|--|----------|--|----------|----------------------------|
| Predictor variables | B | SE | t | Model R² |
| Procrastination | -.140 | .029 | -4.78*** | .185*** |
| Academic performance | 3.512 | .076 | 4.62*** | |
| Procrastination X Academic performance | .259 | .079 | 3.28** | |

| | | Dependent variable: Well-being | | |
|----------------------------|----------|---------------------------------------|----------|----------------------------|
| Predictor variables | B | SE | t | Model R² |
| Self-esteem | .92 | .14 | 6.31*** | .270*** |
| Procrastination | -.30 | .08 | -3.78** | |

| Reverse Model | | Dependent variable: Academic performance | | |
|-------------------------------|----------|---|--------------------|----------------------------|
| Predictor variables | B | SE | t | Model R² |
| Procrastination | -.012 | .002 | -5.57*** | .184*** |
| Self-esteem | .015 | .004 | 3.78** | |
| Procrastination X Self-esteem | .0005 | .0004 | 1.14 ^{ns} | |

| | | Dependent variable: Well-being | | |
|----------------------------|----------|---------------------------------------|--------------------|----------------------------|
| Predictor variables | B | SE | t | Model R² |
| Academic performance | 4.07 | 2.17 | 1.88 ^{ns} | .150*** |
| Procrastination | -.41 | .09 | -4.84*** | |

^{ns} $p > .05$, ** $p < .01$, *** $p < .001$

Furthermore we tested the reverse model whether an indirect effect of procrastination on well-being by the mediation of academic performance varies in accordance with the level of self-esteem. Results of moderated mediation analysis indicated that (a) academic performance does not mediate the relationship between procrastination and well-being, (b) both procrastination and self-esteem have direct effect on academic performance but the interaction effect of them on academic performance is not significant ($\Delta R^2 = .003, p > .05$). (See [Table 2](#)).

Discussion

The current study attempts to provide a more detailed investigation regarding the effects of procrastination on well-being. Findings are in line with those of previous studies which focused on the links between procrastination and academic performance (e.g., Kim & Seo, 2015; Steel, 2007), self-esteem (Burka & Yuen, 2008; Ferrari et al., 1995; Covington, 2007; Pychyl et al., 2002) and well-being (e.g., Balkis & Duru, 2016; Fernie et al., 2016; Gagnon et al., 2016; Sriois & Tosti, 2012; Steel, 2010). Present findings suggested that procrastinating students are more likely to have poor academic performance, self-esteem and well-being.

Findings also confirmed the first hypothesis which was that procrastination and academic performance interacts to predict self-esteem. Negative relationship between procrastination and self-esteem is stronger when the level of academic performance is low. Findings demonstrated that self-esteem of students with low academic achievement is affected more when they postpone their existing tasks and responsibilities; however self-esteem of students with high academic achievement is not so much affected by the procrastination behavior. Considering that students with high level of self-esteem have high academic achievement as well, these students might perform less procrastination. Similarly, high academic achievement serves as a resource which feeds self-esteem, in turn high level of self-esteem may lead these students to delay their tasks less. Even these students may procrastinate; they may attribute this to conditional and environmental reasons; in other words to the external factors rather than to their self. Nevertheless, in order to test these judgments, further studies are required. Briefly, these findings are in line with those of studies which indicated the important role of academic performance on the development of self-esteem (Alves-Martins et al., 2002; Baumeister et al., 2003; Filozof et al., 1998). There are two different views for the studies examining the relationship of self-esteem and academic performance. One side of the research emphasized that academic performance is an important predictor of self-esteem (Alves-Martins et al., 2002; Bowles, 1999; Filozof et al., 1998; Hoge et al., 1995), while the others indicated that self-esteem is a determinant of academic performance (Chapman, 1988; Hansford & Hattie, 1982; Marsh et al., 1988). Both views were tested in this study. Findings indicated that academic

performance had a moderator role on the relationship between procrastination and self-esteem however self-esteem didn't have a similar role on the relation of procrastination and academic performance. Put differently, self-esteem of students with low academic achievement is more affected when they don't perform their tasks on time. In the meantime, the negative effect of procrastination on academic achievement does not vary according to the student's self-esteem. Therefore, this finding supports the studies which emphasized the determinant role of academic performance for self-esteem, while it does not the ones which noted that self-esteem is determinant for academic achievement. Still, in order to have more clear information about the relationship between academic performance and self-esteem, longitudinal studies are required to be conducted.

The present findings also confirmed the second hypothesis which was that self-esteem mediates the relationship between procrastination and well-being. However, this indirect effect is conditional on the academic performance and is stronger when the level of academic performance is low. Findings revealed that the effect of procrastination on well-being varies according to the level of self-esteem. In other words, when self-esteem is affected from procrastination negatively, the negative effect of procrastination on well-being also increases. Many research stated that there is a negative relationship between procrastination and self-esteem (Ferrari, 1991; Duru & Balkis, 2014; Klassen & Kuzucu, 2009), and individuals with low level of self-esteem have more problems on psychological adjustment (Leary, 2005; Pyszczynski et al., 2004). Findings also suggested that the indirect effect of procrastination on well-being via self-esteem varies according to the level of academic performance. When academic performance is poor, the indirect effect of procrastination via self-esteem on well-being is strong, however when academic performance is high, this effect is not meaningful. Put differently, the self-esteem of students, who have low level of academic performance, are affected more negatively when they delay their tasks and requirements, and the indirect effect of procrastination via self-esteem on well-being increases more. In sum, findings supported the previous studies which had stated that academic performance have an important role for self-esteem (e.g., Alves-Martins et al., 2002; Baumeister et al. 2003) and self-esteem has an important role for

the psychological adjustment of an individual (Smokowski et al., 2014; Sowislo & Orth, 2012).

Conclusion

In the current study, integrated effects of procrastination, academic performance and self-esteem on well-being have been investigated. The following conclusions can be drawn from the present study: (a) procrastination has a negative impact on self-esteem by interrupting academic performance; (b) self-esteem mediated the association between procrastination and well-being; and (c) the indirect effect of procrastination on well-being by the mediation of self-esteem is stronger in the case of poor academic performance. This research contributed to the literature by suggesting that procrastination does not always has a protective role for self-esteem, furthermore it adversely affects students' self-esteem by interrupting their academic performance. The present study also demonstrated how and when the procrastination affects well-being of the students. As suggested by the findings, procrastination has a negative impact on students' well-being by low level of self-esteem in the case of poor academic performance. Academic performance is important because it lessens the adverse impact of procrastination on students' well-being. Therefore, intervention programs that focus on improving academic performance of procrastinating students may contribute the level of their self-esteem. Findings also proved the mediator role of self-esteem in the relationship of procrastination and well-being. This indirect effect is stronger for the students who have low level of academic performance. Thus, intervention studies for decreasing procrastination might help to increase students' self-esteem through improving academic performance; and in turn it increases well-being.

This study should be evaluated with its limitations. First of all, the research is limited to a cross-sectional design. Further studies could test the long-term impacts of procrastination, academic performance and self-esteem on well-being by adopting longitudinal designs. Secondly, the relations between the variables are required to be examined for students attending different universities and with different age groups. Lastly, this study was conducted with the members of a culture which demonstrate similar characteristics. Considering that self is affected by the culture, further

research with different cultures and societies might contribute to understand better the relations of the variables.

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