

Procrastination: Rethinking Trait Models

Erteleme: Özellik Modellerinin Gözden Geçirilmesi

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Abstract

The purpose of the present study is to examine the reciprocal relationship between procrastination and neuroticism depending on conscientiousness and negative life events within the scope of a non-recursive model. The study was carried out during the 2011-2012 academic year on 677 teacher candidates (363 females, 302 males) attending the Art and Design Faculty of Gazi University. The participants were administered the Personality Test Based on Adjectives (Bacanlı et al., 2007), the General Procrastination Scale (Çakıcı, 2003), and the Life Events Inventory (Dinç, 2001). The results of this study indicated that there was a positive reciprocal relationship between neuroticism and procrastination, and that conscientiousness was negatively correlated with procrastination whereas negative life events were positively correlated with neuroticism. Also, the indirect effects of conscientiousness on neuroticism and of negative life events on procrastination were found to be statistically significant.

Keywords: procrastination, neuroticism, conscientiousness, negative life events, non-recursive model

Öz

Bu çalışmanın amacı, erteleme ile nevrozizm arasındaki karşılıklı ilişkiyi, sorumluluk ve olumsuz yaşam olaylarına bağlı olarak, non-recursive bir model kapsamında incelemektir. Çalışma, 2011-2012 eğitim ve öğretim yılında Gazi Üniversitesi Sanat ve Tasarım Fakültesi'nde öğrenimlerine devam eden 677 öğretmen adayı (363'ü kadın, 302'si erkek, 12'si belirtilmedi) üzerinde yapılmıştır. Katılımcılara Sıfatlara Dayalı Kişilik Testi (Bacanlı ve ark., 2007), Genel Erteleme Ölçeği (Çakıcı, 2003) ve Üniversite Öğrencileri İçin Yaşam Olayları Envanteri (Dinç, 2001) uygulanmıştır. Çalışmanın sonuçları, nevrozizm ve erteleme arasında pozitif yönde karşılıklı ilişkilerin bulunduğunu, sorumluluğun erteleme ile negatif yönde, olumsuz yaşam olaylarının ise nevrozizm ile pozitif yönde ilişkili olduklarını göstermektedir. Ayrıca sorumluluğun nevrozizm; olumsuz yaşam olaylarının da erteleme üzerindeki dolaylı etkileri istatistiksel bakımdan anlamlı bulunmuştur.

Anahtar Sözcükler: erteleme, nevrozizm, sorumluluk, nonrecursive model, olumsuz yaşam olayları.

Introduction

Almost everyone must have delayed at least one or more of their tasks. Does this make an individual a procrastinator? Of course not, because procrastination is defined as feeling anxious when a task is delayed and as a maladaptive behavior that is displayed deliberately and regularly even when it is known that negative results will ensue (Ferrari, 2010). As is stressed out by this definition, procrastination is a repetitive behavioral pattern stemming from uncontrolled environmental conditions. This, in turn gives raise to the thought that procrastination is a personality trait and the inquiring regarding its relationship with higher-order personality traits. As a matter of fact, research findings show that procrastination has a high negative correlation with conscientiousness (Johnson & Bloom, 1995; Schouwenburg & Lay, 1995) and a moderately positive correlation with neuroticism (Steel, 2007; van Eerde, 2004; Watson, 2001). No statistically

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significant relationship between procrastination and other personality traits such as agreeableness, openness to experiences, and extraversion are observed in these studies.

Studies investigating the relationship between procrastination and conscientiousness show that there is a negative and linear correlation between the two variables ranging between $-.21$ and $-.81$ (Dewitte & Schouwenberg, 2002; Diaz-Morales, Cohen, & Ferrari, 2008; Fabio, 2006; Johnson & Bloom, 1995; Kandemir, 2010; Kelly & Johnson, 2005; Lay, 1997; Lay & Brokenshire, 1997; Lay, Kovacs, & Danto, 1998; Milgram & Tenne, 2000; Moon & Illingworth, 2005; Özer & Altun, 2011; Scher & Osterman, 2002; Schouwenberg & Lay, 1995; Steel, 2002; Steel, 2007; Steel, Brothen, & Wambach, 2001; van Eerde, 2003a; van Eerde, 2004; Watson, 2001). The fact that the results of these studies depict a high level of relationship between these two variables results in the evaluation of procrastination as a lack of conscientiousness (Johnson & Bloom, 1995; Lay, Kovacs, & Danto, 1998; Scher & Osterman, 2002; Schouwenberg, 1995; Schouwenberg & Lay, 1995; Steel, 2002).

Although McCown, Petzel, and Rupert (1987) indicate the existence of a curvilinear relationship between neuroticism and procrastination, in recent studies, it is emphasized that there is a linear relationship between these two variables, ranging from $.15$ to $.51$ (Fabio, 2006; Hess, Sherman, & Goodman, 2000; Lay, 1997; Milgram & Tenne, 2000; Steel, 2002; Steel, 2007; van Eerde, 2004; Watson, 2001). On the other hand, there are also research results showing that there is no statistically significant relationship between neuroticism and procrastination (Dewitte & Schouwenberg, 2002; Johnson & Bloom, 1995; Schouwenberg & Lay, 1995; Steel, Brothen, & Wambach, 2001). Additionally, it is considered that procrastination can be explained better by first-order traits such as impulsiveness instead of the higher-order personality traits such as neuroticism (Lay, 1997). Also, since the sub-dimensions of procrastination such as fear of failure and task aversiveness are correlated with depression and anxiety, it causes to investigate the relationship between the sub-dimensions of neuroticism and procrastination. In these studies, it is observed that the relationship between procrastination and anxiety varies between $.14$ and $.40$ (Aitken, 1982; Beswick & Rothblum, 1988; Caldwell & Mowrer, 1998; Kağan, 2009; Rothblum, Solomon, & Murakimi, 1986; Scher & Osterman, 2002; Senécal, Koestner, & Vallerand, 1995; Steel, 2002), that the relationship between procrastination and depression varies between $.27$ and $.39$ (Beswick & Rothblum, 1988; Senécal, Koestner, & Vallerand, 1995; Steel, 2002; Watson, 2001), and that the relationship between procrastination and impulsiveness varies between $.18$ and $.33$ (Johnson & Bloom, 1995; Schouwenberg & Lay, 1995; Steel, 2002; Watson, 2001).

It is understood from research results related with personality traits and procrastination that procrastination has a consistent relationship with conscientiousness, but its relationship with neuroticism is inconsistent. It is also observed that some studies (Jackson, Weiss, & Lundquist, 2000; Johnson & Bloom, 1995; Kağan, 2009; Milgram & Toubiana, 1999; Schouwenberg & Lay, 1995; Senécal, Koestner, & Vallerand, 1995; Steel, 2002; Watson, 2001) consider the anxiety, depression, and impulsiveness, -the sub-dimensions of neuroticism- as the cause of procrastination whereas some studies (Caldwell & Mowrer, 1998; Rothblum, Solomon, & Murakimi, 1986) evaluate these sub-dimensions as the result of procrastination. These results necessitate redefining the relationship between procrastination and neuroticism. Thus, Ferrari, Johnson, and McCown (1995) assert that as depressive individuals cannot complete their tasks on time, procrastination may sometimes cause a risk factor for depression and anxiety as well. Similarly, Fee and Tangney (2000) stated that feelings of shame may both be motivator and result of procrastination. Moon and Illingworth (2005) report that procrastinating behavior of students tend to increase during the semester and it sharply decreases at the end of the semester, in other words, this behavior follows a hyperbolic tendency. They also state that the trait approaches which assert the fact that traits do not change according to conditions and time and that the effect is unidirectional from trait to behavior can not sufficiently explain the underlying causal explanations, further stating that trait approaches require a change reflecting the effects of the environment. The common ground of these explanations can be specified as that procrastination can also be considered as the cause of neuroticism. Furthermore, as is the case with previous studies, the unidirectional specifications of the relationship among these

variables from higher order personality traits to procrastination (Lay, 1997; Lay & Brokenshire, 1997, Schouwenburg & Lay, 1995; Simpson & Pychyl, 2009) fail to satisfy.

In contrast to trait approaches that consider traits as changing and developing constructs based on genotypes (Brody, 1994, Loehlin, McCrae, Costa, & John, 1998; McCrae, 2001), this study is based on the interaction approach and procrastination as a negative life event has been assumed to be a risk factor for neuroticism. According to the interaction approach, personality traits affect the perception of events and personality traits may change based on the result of social expectations and significant experiences as well (Branje, van Lieshout, & Gerris, 2007; Cobb-Clark & Schurer, 2011; Jang, et al., 2006; Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009; Pervin, 1994; Roberts, Wood, & Smith, 2005). What lies behind the grounding of the study on such an approach is the fact that neuroticism level decreases during adolescence (Finn, 1986, as cited in Matthews, Deary, & Whiteman, 2009; De Fruyt, et al., 2006; Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2009; McCrae, et al., 2000; Pullmann, Raudsepp, & Allik, 2006; Roberts, Walton, & Viechtbauer, 2006; Robins, Nofhle, Trzesniewski, & Roberts, 2005) and the fact that trait theorists point out the effects of state anxiety on neuroticism along with the possibility of decreasing neuroticism with friends support (Costa & McCrae, 1977; as cited in Matthews, Deary, & Whiteman, 2009; Hampson & Goldberg, 2006).

In conclusion, the purpose of the present study is to examine whether the relationship between neuroticism and procrastination is reciprocal or not. It is assumed that neuroticism may affect the perception of environmental stress factors and planning the future, besides it may cause the delay of tasks in individual with low arousal levels (Hess, Sherman, & Goodman, 2000). It is also thought that procrastination as a source of stress may cause emotionally and behaviorally improper reactions. In the light of this idea, the hypothesized model of this study has been given in Figure 1.

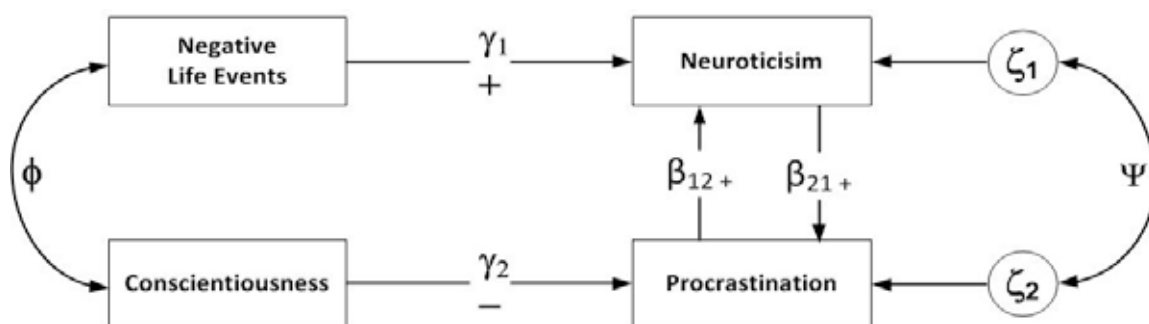


Figure 1: Hypothesis Model

As can be seen in Figure 1, it is estimated that the conscientiousness predicts procrastination negatively whereas negative life events predict neuroticism positively. In the study, negative life events and conscientiousness are identified as instrumental variables and in addition, positive reciprocal feedback loop relations are specified between neuroticism and procrastination.

Method

Participants

This study was carried out during 2011-2012 academic year on 677 teacher candidate attending Art and Design Faculty of Gazi University. Teacher candidates from almost all cities of Turkey attend Gazi University located in Ankara, the capital city. Of the participants, 363 (53.6%) were female, 302 (44.6%) were male and 12 didn't specified their gender. Also, 89 (13.1%) of the participants were freshmen, 236 (34.9%) were sophomores, 192 (28.4%) were juniors, and 79 (11.7%) were seniors. The mean CGPA (Cumulative Grade Point Average) of the teacher candidates was 3.09 ($SD = .38$). Convenient sampling was used for selecting the participants.

Instruments

Personality Test Based on Adjectives (PTBA): The PTBA developed by Bacanlı, İlhan, and Aslan (2007) is a list of adjectives prepared to measure the personality dimensions proposed by the five factor personality model. The list contains a total of 40 items with opposite adjective pairs. The high scores obtained from PTBA signify the fact that the individual displays a tendency regarding the personality traits in the related dimension. "Competitive... Cooperative" and "Selfish... Altruistic" may be given as examples to the adjective pairs in the list. The internal consistency coefficients (Cronbach's α) of the measurements obtained from PTBA were between .73 and .89; the test-re-test coefficients were observed between .68 and .86 (Bacanlı, İlhan, & Arslan, 2007).

General Procrastination Scale (GPS): The GPS, developed by Çakıcı (2003) aims to measure how timely individuals maintain their daily tasks. The scale consists of procrastination and time management dimensions and contains a total of 18 items, 11 of them are negative. The high scores indicate a tendency to procrastinate. "Even if I have made my decision I wait until the last moment to act" and "I act when it is too late" may be given as examples to the items in the scale. The internal consistency coefficient (α) of the scale was found as .91; whereas the test-retest reliability coefficients obtained from two different studies were .82 and .83 (Çakıcı, 2003).

Life Events Inventory for University Students (LEIU): The LEIU, developed by Oral (1999) and revised by Dinç (2001), aimed to measure the levels at which university students are affected by negative life events they face in their daily lives. The revised version of the LEIU used in this study contains two dimensions; "success in life events" and "social life events". The inventory contains 47 items. "Loneliness anxieties" and "Family problems" may be given as examples to the items in the scale. Since negative life events should be related with neuroticism and not related with procrastination in order to ensure the assumption of order condition regarding the research model, only the social life events sub-scale of the LEIU has been used in this study. The internal consistency coefficients (α) were .88 for success in live events and .86 for social life events (Dinç, 2001).

Personal Information Sheet: A form prepared by the researcher was used in order to obtain information regarding the gender, grade level and CGPA of the participants.

Procedure

Instruments were administered by the researcher in the lectures during the spring semester of 2011-2012 academic year. It lasted about 20 minutes and prior to the administration the purpose of the study was explained to the participants who took part in the study voluntarily.

Data Analysis

The relationships between variables are tested by using path analysis with a nonrecursive model. Nonrecursive models are defined as the models which have feedback loop or may have correlated disturbances (Kline, 2010). Nonrecursive models have two important assumptions, namely stationarity and equilibrium. The assumptions are evaluated on a logical ground, but the fact that the stability indexes of the models are less than one (range between .00 and .07 for this research) points out that the assumption of equilibrium is met (Arbuckle, 2011). In addition to these assumptions, the order and rank conditions should also be met (Berry, 1984). There are two endogenous variables in the research model. Accordingly, each endogenous variable should be predicted by at least one instrumental variable in order to ensure the stability condition (Berry, 1984; Kenny, 2011; Mulaik, 2009; Rigdon, 1995). As can be seen in Figure 1, each endogenous variable is predicted by one instrumental variable. Thus, it can be stated that the stability condition is met. The rank condition satisfies in case the rank value obtained for each endogenous variable from the reduced matrices is equal to or greater than the total number of endogenous variables minus one (Kline, 2010). Then, the rank condition is sufficient to identify the research model, because the rank of the equation for each endogenous variable equals one. Moreover, the assumptions for recursive models such as normality, linearity, and that there are no outliers,

and multicollinearity were tested. The results of analysis showed that these assumptions are also met adequately apart from normality. Therefore, Yuan-Bentler estimation method and robust standard errors are used (Tabachnick & Fidell, 2007). AMOS 20 and EQS 6.1 software were used for data analysis and the significance level for the hypothesis (α) is assumed to be .05.

Findings

The endogenous variables of this study are neuroticism and procrastination whereas the instrumental variables are negative life events and conscientiousness. First, descriptive statistics related with these variables are given in Table 1. Model tests and model comparisons are presented later.

Table 1.

Descriptive statistics, Pearson correlations, and internal consistency (Cronbach α) coefficients for the variables

| Variables | 1 | 2 | 3 | 4 |
|-------------------------|-------|-------|-------|-------|
| 1. Procrastination | .89* | | | |
| 2. Negative life events | .30 | .89* | | |
| 3. Neuroticism | .19 | .40 | .78* | |
| 4. Conscientiousness | -.60 | -.28 | -.20 | .86* |
| \bar{x} | 37.92 | 45.96 | 22.46 | 36.51 |
| df | 10.53 | 13.24 | 8.88 | 8.60 |

* The internal consistency coefficients of the variables are given at diagonal (n= 677)

As seen in Table 1, the internal consistency coefficients (α) of the variables range between .78 and .89. The relationship between procrastination and conscientiousness is -.60, whereas the relationship between neuroticism and procrastination is .19. In addition, the correlation coefficient between negative life events and neuroticism is .40. Path analysis was applied to the data to examine to what degree the tested models explain the observed correlations between variables. The results are given in Table 2.

Table 2.

Goodness of fit measures for the path models

| Model | Yuan-Bentler χ^2 | df | p | Bollen-Stine Bootstrap (p) | CFI | SRMR | RMSEA (% 90 C. I.) | $\Delta\chi^2_{df}$ |
|------------------------------|--------------------------|----|------|-------------------------------|------|------|--------------------|------------------------|
| 1. $\beta_{12} = \beta_{21}$ | 0 | 0 | 1.00 | - | 1.00 | .00 | .00 | - |
| 2. $\beta_{12} = 0$ | 4.48 | 1 | .03 | .02 | .99 | .03 | .09 (.03-.16) | 4.48 ₍₁₎ ** |
| 3. $\beta_{12} = \beta_{21}$ | 3.96 | 1 | .05 | .05 | .99 | .02 | .07 (.02-.15) | 3.96 ₍₁₎ * |

Table 2 contains the results related with the hypothesized model. The data set consists of four variables. In this case, the variance - covariance matrix obtained from the data set contains $(4*(4+1)/2)$ 10 elements. It is estimated that there are 10 parameters (4 weight, 1 covariance, 1 error covariance, 2 variances, and 2 error variance) in the model. Thus, the hypothesized model is just identified (number of observations-number of parameters= 0). As in regression analysis, since df equals to 0 in just identified models, only parameter estimations are interpreted instead of the goodness of fit measures (Kline, 2010).

Table 2 also contains results of the nonrecursive model asserting that the relationship between procrastination \bar{a} neuroticism equals zero. In other words, the causal relationship

between the two variables is only from neuroticism to procrastination. Since the procrastination a neuroticism parameter estimated in the previous model is equal to zero, the *df* of the second model has increased by one. Thus, it is possible to interpret the goodness of fit measures of the second model. As seen in Table 2, the goodness of the fit measures of the second model are low ($\chi^2_1 = 4.48, p = .02$). According to this result, model 1 is better than model 2 at explaining the variance - covariance matrix obtained from the data set. Therefore, the relationship among the two variables is not only unidirectional from neuroticism to procrastination and that procrastination may also cause neuroticism. Lastly, Table 2 examines whether the reciprocal effect between neuroticism and procrastination is equal or not. Statistical findings show that the goodness of fit measures of model 3 are also low ($\chi^2_1 = 3.96, p = .00$). The effect of neuroticism on procrastination is stronger than the reverse in feedback loop. In the light of these findings, it has been concluded that model 1 is better than the other models in explaining the relationships between variables and the direct, indirect, and total effects regarding model 1 are presented in Table 3.

Table 3.

Direct, indirect, and total effects

| | Effects | | B | SE | β | Z |
|-----------------|------------------|----------------------|------|-----|---------|----------|
| | Direct effects | | | | | |
| Procrastination | ← | Conscientiousness | -.55 | .04 | -.53 | -12.55** |
| | | Neuroticism | .38 | .10 | .38 | 3.88** |
| Neuroticism | ← | Negative life events | .35 | .05 | .35 | 7.60** |
| | | Procrastination | .16 | .08 | .16 | 2.11* |
| | Indirect effects | | | | | |
| Procrastination | ← | Procrastination | .07 | .04 | .07 | 1.64 |
| | | Neuroticism | .03 | .02 | .03 | 1.27 |
| | | Conscientiousness | -.04 | .03 | -.04 | -1.50 |
| | | Negative life events | .14 | .05 | .14 | 2.70** |
| Neuroticism | ← | Neuroticism | .07 | .04 | .07 | 1.64 |
| | | Procrastination | .01 | .01 | .01 | .95 |
| | | Conscientiousness | -.09 | .05 | -.09 | -1.80* |
| | | Negative life events | .02 | .01 | .02 | 1.43 |
| | Total effects | | | | | |
| Procrastination | ← | Procrastination | .07 | .04 | .07 | 1.64 |
| | | Neuroticism | .41 | .11 | .40 | 3.57** |
| | | Conscientiousness | -.59 | .06 | -.57 | -9.20** |
| | | Negative life events | .14 | .05 | .14 | 2.70** |
| Neuroticism | ← | Neuroticism | .07 | .04 | .07 | 1.64 |
| | | Procrastination | .17 | .09 | .17 | 1.96* |
| | | Conscientiousness | -.09 | .05 | -.09 | -1.80* |
| | | Negative life events | .37 | .06 | .38 | 6.33** |

* $p < .05$, ** $p < .01$ B= unstandardized coefficient - β = standardized coefficient*Direct effects*

As can be seen in Table 3, there is a negative relationship between procrastination and conscientiousness ($B = -.55, p < .01$), whereas there is a positive relationship between negative life events and neuroticism ($B = .35, p < .01$). There is also a positive reciprocal relationship between neuroticism and procrastination. Accordingly, a one-point increase on conscientiousness predicts a -.55-point decrease on procrastination, controlling for neuroticism. Similarly, a one-point increase on negative life events predicts a .35-point increase on neuroticism, controlling for procrastination. Besides, procrastination increases as neuroticism increases ($B = .38, p < .01$), whereas increased procrastination predicts greater neuroticism ($B = .16, p < .01$). Standardized regression coefficients indicate that conscientiousness ($\beta = -.53, p < .01$) is more effective on procrastination than neuroticism ($\beta = .38, p < .01$). Also, the effect of neuroticism on procrastination is stronger than the effect of procrastination on neuroticism. Accordingly, one standard deviation increase in neuroticism scores result in almost .38 standard deviation increases in procrastination. Likewise, one standard deviation rise in the procrastination score causes a .16 standard deviation change in neuroticism scores.

Indirect effects:

As can be seen in Table 3, the indirect effects of both negative life events on procrastination ($B = .35 \cdot .38 = .14$, $p < .01$) and conscientiousness on neuroticism ($B = -.09$, $p > .05$) were found to be statistically significant. Accordingly, a one-point increase on negative life event predicts a .35-point increase on neuroticism, but only .38 of this effect is transmitted to procrastination. Similarly, a one-point difference on conscientiousness predicts a .55-point variation on procrastination, but .16 of this value is transmitted to neuroticism.

The variables in reciprocal relationship have indirect and total effects on themselves. In such a relationship, the indirect effect of neuroticism on itself can be calculated as follows: a unit increase in neuroticism causes a ($1 \cdot .38 \cdot .16$) return effect of .061-point on neuroticism. Now, neuroticism increases by .061 and this increase produce a return effect of .004 ($.061 \cdot .38 \cdot .16$). This return effect then go continually around the feedback loop and results in smaller and smaller changes on neuroticism (.0002 and .00001 respectively). Even though these terms mathematically quickly approach to zero, the indirect effect on itself is theoretically infinite because of feedback loop. Accordingly, the indirect effects on themselves of the variables in reciprocal relationships are about ($.061 + .004 + .0002 + .00001 \dots$) .07 ($p > .05$). Another word, neuroticism result in an increase in procrastination and a part of this increase turn back to neuroticism and vice versa. Moreover, the indirect effects of reciprocally related variables (neuroticism and procrastination) on each other are (.41-.38) .03 and (.17-.16) .01 ($p > .05$).

Total effects:

In recursive models, the total effect of a variable on another equals to the sum of the direct and indirect effects (Kline, 2010). Accordingly, the total effect of negative life events on neuroticism is (.35+.02) .37, and the total effect of conscientiousness on procrastination is (-.55 + -.04) -.59. The total effect of neuroticism on procrastination can be calculated as follow: if neuroticism increases one unit, the effect on procrastination occurs (.39 + .39(.17*.39) + .39(.17*.39)² + 39(.17*.39)³ +). These infinite series, calculated by the formula $\beta_{21}/(1-\beta_{12}\beta_{21})$, converge to .38/1-(.38*.16) .41. Similarly, the total effect of procrastination on neuroticism is .17. Apart from these explanations, the explained variance in procrastination scores (Bentler-Raykov Corrected R²) is .31, whereas the explained variance in neuroticism scores is .16.

Discussion

The present study examines the reciprocal relationship between procrastination and neuroticism concerning conscientiousness and negative life events. It has been found that neuroticism predicts procrastination positively and that procrastination predicts neuroticism. In addition, the effect of neuroticism on procrastination is greater than that of procrastination on neuroticism. McCrae and Costa (2003) stated that neuroticism has anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability sub-dimensions. They also claimed that fear and anger lie under anxiety and hostility dimensions; whereas sadness and shame lie under depression and self-consciousness dimensions. According to McCrae and Costa (2003), neurotic individuals tend to continue to make mistake, experience hopelessness with low self-esteem, cannot resist to temptation due to lack of control, act impulsive, cannot bear pressure, and panic during emergencies. Watson and Kendall (1989) assert that anxiety can be explained by cognitions regarding possible fearful or harmful events that will take place in the future; whereas depression can be explained by real or perceived losses or failures in the past (as cited in Lay, 1995). Procrastinators experience anxiety because they think that they will not be able to meet the high demands of others and will receive negative evaluations regarding their performances (Solomon & Rothblum, 1984). In this case, it can be claimed that the feelings of distress and anxiety are traits of neuroticism and that they affect the perception of the task to be postponed. Besides, procrastinators do not use their time efficiently (van Eerde, 2003b), and spend less time

preparing for their tasks (Ferrari, 1993). These characteristics of procrastinators can be explained by impulsiveness which is a sub-dimension of neuroticism. When procrastinators undertake a task, they act impulsively and start dealing with other tasks to postpone the evaluations that will be made about them in order to preserve their self-esteem. Thus, it is possible to state that neuroticism continues to affect behavior during procrastination as well. Then, even though procrastination temporarily prevents anxiety, the fact that tasks are carried out at the last minute causes some to be late and some to be completed in a careless manner. Sadness and regret are experienced as a consequence of not being able to complete the tasks on time or completing the tasks sloppily along with negative evaluations (Ferrari, 2010). Guiltiness, sadness, and regret are features of depression which is a sub-dimension of neuroticism and in this case it can be stated that procrastination has caused depression. As a result, this finding is consistent with previous studies comprise the preamble of this study (Fee & Tangney, 2000; Ferrari, Johnson, & McCown, 1995). Neuroticism and procrastination go hand in hand. In other words, neuroticism as a higher order personality trait causes procrastination as a summary variable and as a result procrastination contributes to an increase in neuroticism. In this regard, it may be stated that by providing protective mental health services to university students to prevent neuroticism, their tendency to procrastinate may be decreased or that their psychological adjustment can be improved by preventing procrastination.

The standardized path coefficient between neuroticism and procrastination is higher than Pearson correlation coefficients among these variables. The difference among the coefficients points out suppression in the model. Suppressor variables are only correlated with independent variables and suppress the specific variances of these variables on the criterion, thus they change the size and direction of the parameter estimates of the independent variables (Kline, 2010; Tabachnick & Fidell, 2007). To define nonrecursive models, the model is required to have at least one instrumental variable – not related to other endogenous variables – for each endogenous variable in feedback loop. Since the instrumental variables in this model are correlated with only their endogenous variables and reciprocal relation among the endogenous variables is specified, it is inevitable that suppressor variables increase the regression weights among the endogenous variables as compared to the correlation among these variables through suppressing specific variance in their endogenous variables. With this regard, the effect of neuroticism on procrastination could be found greater than its actual value. It can be concluded that the association between neuroticism and procrastination is consistent with the literature due to significant Pearson correlations between these variables. Even so, aforementioned relations should be replicated on similar samples.

Another finding of the study is that conscientiousness negatively predicts procrastination. Also, conscientiousness is more effective on procrastination than neuroticism. McCrae and Costa (2003) claimed that conscientiousness has sub-dimensions of competence, order, dutifulness, achievement striving, self-discipline and deliberation. According to McCrae and Costa, conscientious individuals make plans prior to acting to reach their goals and they do not give up working until they complete the task even if they are bored or if they are distracted. Accordingly, it can be concluded that individuals with high levels of conscientiousness will not experience fear of failure because they find themselves capable enough and that instead of avoiding from work they will continue working until the task is completed. Procrastinators cannot use their time efficiently and spend less time to prepare for their tasks whereas a highly conscientious individual work in a planned manner and continue working until their tasks are completed despite the difficulty of the task or conditions that instigate person to stop working. Hence, this is an expected result and consistent with previous studies. Also, in this study the indirect effect ($\beta = -.09$) of conscientiousness on neuroticism is statistically significant. Kline (2010) states that standardized coefficients can be classified as those around .10 with low effect size, those around .30 with moderate effect size, and those around and above .50 with high effect size. According to this criterion, it can be stated that the effect of conscientiousness on neuroticism is low. Even though this finding has similarities with the approach of Lee, Kelly and Edwards (2006), it is an

unexpected finding, because five-factor personality model claimed that higher order personality dimensions are unrelated (Saucier, 2002). Therefore, a direct relationship has not been defined between conscientiousness and neuroticism in this study. In addition, the possible reasons for unexpected results of the present study may be the fact that significant correlations are observed between personality dimensions of five factor personality inventory (common method variance). For example, it is seen in the NEO-PI-R handbook that the relationship between neuroticism and conscientiousness is .53 (Costa & McCrae, 1992). Also Digman (1997) indicates that the reason for the five factors to be unrelated stems more from the factor rotation method (varimax) than the fact that the dimensions are independent. Van der Linden, Nijenhuis and Bakker (2010) claimed that conscientiousness and neuroticism are indicators of a high level factor: stability or alpha. In this case, it can be proposed that procrastination related with the dimensions of neuroticism (anxiety, impulsiveness) and conscientiousness (self-discipline) can be one of the reasons for the relationship between these dimensions. Thus, it can be thought that procrastination in university students can be decreased by developing conscientiousness and that the improvement in procrastination will decrease neuroticism.

The last finding of the study is that negative life events and neuroticism are positively related. In other words, as the scores of negative life events increase, neuroticism scores also increase. This result is inconsistent with the personality perspective of trait approaches. Brody (1994) asserted that "genotypes may contribute to both stability and change in personality traits... If personality traits are influenced by genotypes, it will be difficult to ascertain whether any environmental event is independent of the genetic characteristics of an individual. Genetically influenced dispositions may influence the probability of occurrence of events classified as environmental." (p.118). Similarly, it is stated that personality traits are based on genetic factors (McCrae & Costa (2003), and that the personality changes expressed in adulthood are a misperception (Costa & McCrae, 1989). Nevertheless, it seems difficult to state that personality remains unchanged in an ever-changing world. About 50% of the variance in personality traits can be explained by heredity (Plomin & Caspi, 1999) and the remaining variance is too large to be explained by measurement error (Roberts, Wood, & Smith, 2005). Thus, the importance of the environment (Jang, et al., 2006; Pervin, 1994), especially the environments shared by friends-not shared by siblings- (De Fruyt, et al., 2006; Hergenbahn, 2008) on personality development should be emphasized. In this regard, procrastination as a negative life event due to its results such as experiencing failures, losing respect, experiencing sadness, and regret can be thought as a complementary factor to neuroticism. As a matter of fact, studies on the interaction between personality traits and environmental conditions indicate that certain personality traits affect the reaction to important life events and that experiencing various important life events (birth order, marriage, living with a new spouse, unemployment and losing a family member) along with changes in social roles cause either an increase or a decrease -even if temporarily- in personality traits (Branje, van Lieshout, & Gerris, 2007; Neyer & Lehnart, 2007; Löckenhoff, Terracciano, Patriciu, Eaton, & Costa, 2009; Roberts, Wood, & Smith, 2005; Specht, Egloff, & Schmukle, 2011). Thus, it might be concluded that the results of the present study are congruent with the interaction approach stating that neuroticism can change due to important life events. Moreover, findings show that negative life events (social relations) have an indirect effect on procrastination ($\beta = .14$). At this point, it seems more reasonable to expect that negative events such as problems with opposite sex especially in university life, problems with friends of the same sex and conflicts with family members will first cause feelings of hostility, self-consciousness and feelings of hurt instead of thinking that they will cause procrastination indirectly. It might be claimed that university students procrastinate in order to protect themselves from such negative emotions and thus in turn experience emotional problems.

Conclusion and Suggestions

The findings of this study indicate that there are positive and reciprocal relationships

between neuroticism and procrastination. The findings show that conscientiousness has a negative relationship with procrastination and that negative life events have a positive relationship with neuroticism. In addition, the indirect effects of conscientiousness on neuroticism and of negative life events on procrastination are statistically significant. In the light of these findings, the following suggestions can be made to future studies and those who work as psychological counselor and clinical psychologist:

Conscientiousness is emphasized in the previous studies arguing procrastination shows a hyperbolic distribution (Dewitte & Schouwenburg, 2002; Moon & Illingworth, 2005) and that only the mean scores of procrastination are compared. What motivates the individuals at this point is not the deadline of a task, but the fact that they will be evaluated by others after submission and the neurotic fears experience by the individual during this process. As a matter of fact, the increasing anxiety levels of students just before exams can be given as an example to this process. In this regard, based on the study findings, it might be suggested that further longitudinal studies should examine both neuroticism and conscientiousness as predictive variables. In these longitudinal studies not only the mean levels of procrastination can be examined by using latent growth models and also whether the ranks of individuals change according to different measures in different time is examined with r correlations and by using q correlations whether individuals change over time might be examined.

Besides the effects of personality traits on procrastination behavior, the roles of inspection behavior and properties of the task such as difficulty or boringness can be examined. Multilevel hierarchical linear modeling can be suggested for this purpose.

In previous studies, it is emphasized that conscientiousness and procrastination are combined under the same factor whereas neuroticism makes a loading on a different factor (Schouwenburg, 1995), hence conscientiousness can be a proximal reason of procrastination (Lay, 1997; Schouwenburg, 1995; Schouwenburg & Lay, 1995). Reise, Waller, and Comrey (2000) state that the factor rotation methods used to obtain the simple structure in factor analysis is not suitable for circumplex personality models. In the present study procrastination and neuroticism are positively, whereas procrastination and conscientiousness are negatively related. In this case, the relationships between neuroticism, conscientiousness and procrastination can have a circular in nature. This circular process can be examined by carrying out circumplex analysis.

The findings of this study show that procrastination is not a simple behavior of delaying things. To this end, it is important for both the students and the faculty members to be aware of the individual and environmental factors causing procrastination. In addition, it should be pointed out that while using programs to prevent and decrease procrastination in experimental studies, the development of conscientiousness trait must be considered. Procrastinators cannot make efficient time management and postpone their tasks until the last moment due to low conscientiousness. Therefore, the programs aimed to prevent procrastination may include activities such as listing of delayed tasks, time management related with this list and homework; also self-control can be emphasized. In addition, the neuroticism level of procrastinators is quite high. Hence, the program may include relaxation techniques since they experience difficulties when working under stress. It can be stated that there is a need for experimental studies within this framework.

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