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Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: underregulation or misregulation form

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Abstract The aim of this study was to examine the role of self-regulation failure in procrastination. In addition, it also aimed to investigate the effects of procrastination on affective well-being and academic life satisfaction. Three hundred and twenty-eight undergraduate students participated in the study. The most obvious finding emerging from this study is that the absence or lack of self-regulation skills, as an indicator of underregulation, plays a significant role in procrastination among college students. Whether procrastination is an underregulation or misregulation form of self-regulation failure, it has a negative impact on students' affective well-being. The contribution and implications of these findings were discussed in detail.

Keywords Procrastination · Self-regulation failure · Academic life satisfaction · Affective well-being

Introduction

Procrastination, a widespread problem behavior, has been the focus of attention of many scientists in social sciences during the last century. Procrastination is conceptualized by Tuckman (1991) and Tuckman and Sexton (1989) as a tendency to put off completing or starting a task/assignment under one's control due to lack or absence of self-regulation. The prevalence of procrastination is well-documented in the literature (Balkis and Duru 2009; Ferrari et al. 2007; Harriott and Ferrari 1996; Özer et al. 2009a). For instance, Balkis and Duru (2009) state that 23 % of the students and Özer et al. (2009a) account that 52 % of the students delay their academic duties. In addition, numerous studies show that there is a relation between procrastination and depression and stress and anxiety (Kağan 2009; Sirois 2014; Steel

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2007; Stöber and Joormann 2001). Correspondingly, students who procrastinate are less satisfied with general life (Caldwell and Mowrer 1998; Çapan 2010; Deniz 2006; Hinsch and Sheldon 2013; Özer and Saçkes 2011; Steel 2010) and academic life (Balkis 2013; Chow 2011). Taken together, in the light of the studies above, it can be said that procrastination has a complex nature that involves cognitive, affective, and behavioral components (Solomon and Rothblum 1984) and affects not only the academic lives of the students, but also their well-being in a negative way.

One of the factors affecting academic lives and well-being of students in a negative way is also self-regulation failure. Some researchers additively assert that procrastination is highly related to self-regulation failure (Baumeister et al. 2007; Howell and Watson 2007). Heatherton and Baumeister (1996) define self-regulation failure as one's misachievement taking action (underregulation) or as an individual taking ineffective action (misregulation) in the attempt to initiate, alter, or inhibit a behavior. Conklin (2010) states that failure in self-regulation may occur in several ways, "such as a complete lack of self-regulatory process activation, a breakdown in the self-regulatory process, or the interference of another process" (p. 8). There are two different views about the role of self-regulation failure in procrastination. Some researchers (Ferrari 2001; Howell and Watson 2007; Rabin et al. 2011; Senécal et al. 1995) approach procrastination as the underregulation form of self-regulation failure. Procrastinators fail in setting standards, monitoring performance, and maintaining motivation. The other group of researchers believes that procrastinators engage in misregulation (Baumeister and Heatherton 1996; Sirois and Pychyl 2013; Tice et al. 2001). In other words, procrastination functions as an emotional regulation strategy in order to mend the bad moods caused by the task at hand.

Briefly, although the role of self-regulation failure in procrastination is well-documented in the existing literature, it is not clear to which form of self-regulation failure it is related to. As a result, in the framework of developmental guidance, it is considered that some students may need educational and psychological help and support in the process of coping with procrastination. In addition, if we know which form of self-regulation failure is more important in procrastination, then this can serve as a basis for preventive or psychoeducational programs and can construct contents of these programs effectively. Because of that, it is important to understand how two forms of self-regulation failure specifically influence the well-being and the academic life of students. Consequently, in the light of the information above, the main aims of the current study are to test the possible effects of both forms (misregulation and underregulation) of self-regulation in procrastination and fill out the gap in the literature by using two structural models. Another aim of this study is to understand the mediation role of procrastination on the relationships between negative affect, self-regulation, positive affect, and academic satisfaction.

Theoretical background

Procrastination and self-regulation

Numerous studies have agreed that using self-regulation strategies positively affect academic life (Bembenutty and Zimmerman 2003; Cantwell 1998; Nota et al. 2004). According to Baumeister et al. (2007), self-regulation skills facilitate the adaptation of individual actions to conditional and social demands by improving the flexibility of action. Otherwise, individuals with low self-regulation skills fail to manage their emotions, thoughts, behaviors, and time

effectively and do not use their power and resources successfully (Duru et al. 2014). Recently, some researchers persistently assert that procrastination is highly related to self-regulation failure (Baumeister et al. 2007; Howell and Watson 2007). Initially, it is believed that procrastination results from poor time management skills. Procrastinators experience more difficulty in estimating, organizing, and managing time which is needed for completing tasks successfully. McCown et al. (1987) reported that students with a high level of procrastination underestimate the time needed to complete a task. In terms of time preferences for working, procrastinators are most likely to start studying later for exams (Balkis et al. 2013; Ferrari et al. 1997; Kağan 2009; Lay and Burns 1991; Lay and Schouwenburg 1993; Van Eerde 2003). While some researchers approach procrastination as the underregulation form of self-regulation failure (Baumeister et al. 2007; Howell and Watson 2007), the other group of authors deals with procrastination as the misregulation form of self-regulation failure (Baumeister and Heatherton 1996; Sirois and Pychyl 2013). However, it is not clear which form of self-regulation failure is important in procrastination.

Procrastination as underregulation form of self-regulation failure

Baumeister et al. (2007) approach procrastination as a reflection of poor self-regulation. Howell and Watson (2007) argue that disorganization and low motivation for achievement are characteristics of self-regulated failure in procrastination. In this notion, a growing body of research found that procrastinators report less achievement motivation (Akbay and Gizir 2010; Brownlow and Reasinger 2000; Klibert et al. 2011; Özer and Altun 2011; Rakes and Dunn 2010). For example Rakes and Dunn (2010) found that students who have less intrinsic motivation to learn and less effort of regulation procrastinated more. Özer and Altun (2011) and Howell and Watson (2007) found that procrastination is positively related to performance avoidance orientation and negatively related to mastery orientation. The other characteristic of self-regulation failure in procrastination is disorganization (Howell and Watson 2007). Lay (1986) claimed that "a procrastinator is disorganized, particularly so at a cognitive level and everyday activities" (p. 492). Lay (1986) also reported that a procrastinator tends to score high on the neurotic disorganization scale and low on the organization scale. Howell and Watson (2007) found that students who procrastinate had high scores of disorganization. Similarly, Rabin et al. (2011) reported that self-monitoring, task monitoring, planning, and organization skills predict academic procrastination. Howell and Watson (2007) also argued that the strong link between procrastination and disorganization might support the notions in which procrastination is viewed as a self-regulation failure. As mentioned earlier, procrastinators experience more difficulties in evaluating, structuring, and managing time. Terry and Doolittle (2008) stated that poor time management might reflect deficiencies in self-regulatory processes. Taken as a whole, there seems to be some evidence to indicate that procrastination may be a significant sign of the absence of the self-regulation skill. If so, it can be expected that low self-regulation skills increase procrastination, and increased procrastination might ease the experience of negative feelings and reduce the academic satisfaction level of students (Fig. 1).

Procrastination as misregulation form of self-regulation failure

Baumeister and Heatherton (1996) approach procrastination as misregulation form of self-regulation failure. They stated that when one tends to postpone starting to work on an assignment that causes anxiety, this postponing behavior functions as an emotion regulator

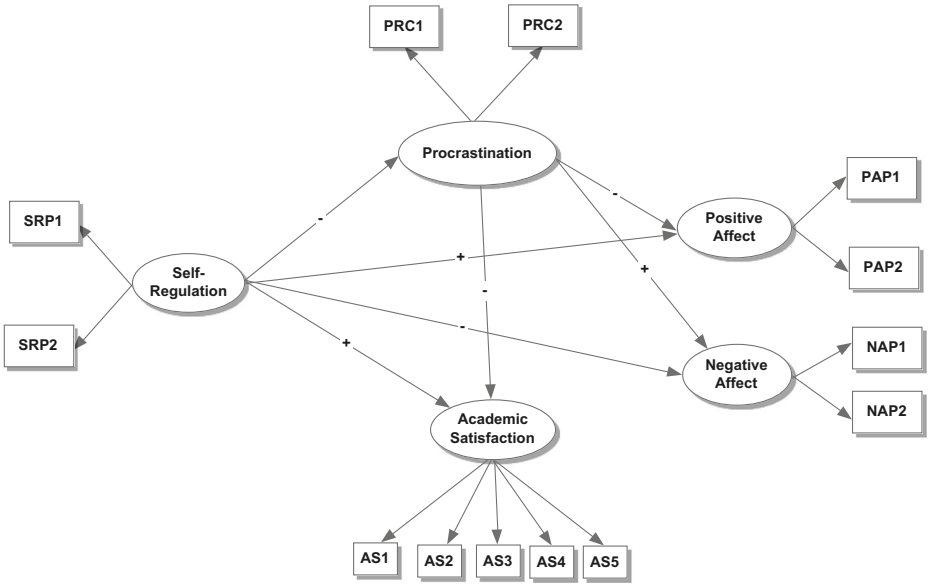

Fig. 1 A theoretical depiction about the role of self-regulation in the development of procrastination

in the short term. However, this decision makes the problem worse as the deadline draws closer and, thus, makes it more difficult to successfully complete a task (Baumeister and Heatherton 1996). Similarly, Sirois and Pychyl (2013) have demonstrated that mood repairs in the short run can seem as self-regulatory failures which result from unpleasant emotional states. Tice et al. (2001) point out that one is more likely to procrastinate when one works on a task that causes an unpleasant emotion, and when s/he believes that these emotional states could be changed by engaging in alternative activities that are seen highly pleasurable. Procrastinators often concentrate on regulating their emotions (Steel 2007). Procrastinators postpone starting the task at hand in order to escape negative feelings it arises (Ferrari 1991). Milgram et al. (1992) found that students with high test anxiety tended to procrastinate more than students with low test anxiety. Haycock et al. (1998) also found that students with a high level of anxiety reported a high level of procrastination. Steel (2007) indicated that negative affect and poor mood do not only stem from procrastination but also lead to it. Ciarrocchi (2001) states that "doing unpleasant tasks usually puts people in a bad mood; procrastination becomes a form of misregulation to control negative feelings" (p. 202). In conclusion, there seems to be some evidence to indicate that procrastination may be a sign of misregulation. If so, it can be expected that the effect of negative moods on positive affect and on the academic satisfaction levels of students may change compared to the level of procrastination (Fig. 2).

Procrastination, self-regulation, academic life satisfaction, and affective well-being

The destructive effect of procrastination on students has been studied extensively. Previous studies have revealed that procrastination is related to depression (Martin et al. 1996; Rabin et al. 2011; Saddler and Sacks 1993; Steel 2007; Stöber and Joormann 2001; Van Eerde 2003; Washington 2004), anxiety (Caldwell and Mowrer 1998; Kağan 2009; Milgram and Toubiana 1999; Rothblum et al. 1986; Sarid and Peled 2010; Stöber and Joormann 2001; Van Eerde

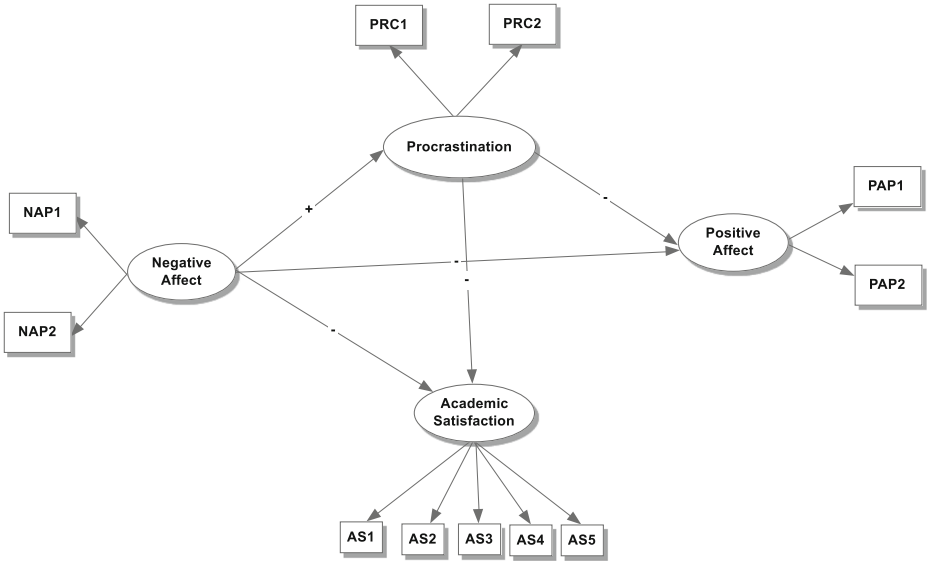

Fig. 2 A theoretical depiction about the emotional regulation role of procrastination

2003), and stress (Sirois 2007, 2014; Sirois et al. 2003; Sirois and Tosti 2012; Stead et al. 2010; Stöber and Joormann 2001; Tice and Baumeister 1997). Correspondingly, students who procrastinate are less satisfied with general life (Caldwell and Mowrer 1998; Çapan 2010; Deniz 2006; Hinsch and Sheldon 2013; Özer and Saçkes 2011; Steel 2010) and academic life (Balkis 2013; Chow 2011). For instance, Özer and Saçkes (2011) found that procrastinators reported lower life satisfaction. Balkis (2013) stated that procrastination made academic lives of college students unpleasant. In fact, Chow (2011) reported that students who expressed dissatisfaction with their school life procrastinated more. In the light of the studies that are mentioned above, the negative impact of procrastination on students might be categorized as internal and external. External consequences of procrastination can directly be conceptualized as a function of procrastination behaviors (i.e., low academic performance). On the other hand, internal consequences of procrastination can mostly be conceptualized as a function of intrapsychic process that may affect students' well-being directly or indirectly. Well-being has affective (positive affect and negative affect) and cognitive components (satisfaction with life) (Diener et al. 1999). In a similar line, Schimmack (2008) recommends that positive affect and negative affect considered relatively independent constructs are two affective components of subjective well-being. As suggested by Schimmack (2008), negative affect and positive affect can be conceptualized as affective well-being. Affective well-being refers to "the intensity and frequency of positive and negative affect" (Reis and Hoppe 2015, p. 21). Although positive affect relates with enjoyable commitment in life, its absence reflects sadness and exhaustion. On the other hand, negative affect comprises a variety of forms of distress while its absence reflects calmness and tranquility (Watson et al. 1988). It is expected that higher levels of positive affect and lower levels of negative affect influence the general and academic life of individuals in a positive way.

In contrast to the negative effects of procrastination on students' well-being, recent evidence suggests that self-regulation has an important curative role in psychological functioning of college students. In this sense, previous studies have indicated that self-regulation is

positively associated with well-being. For example, Hofer et al. (2011) found that students with high levels of self-regulation ability reported high levels of well-being. Özer et al. (2014) found that university students with high levels of self-regulation skills reported lower levels of depression. Simon and Durand-Bush (2014) found a strong positive relation between self-regulation capacity and psychological well-being. In their longitudinal study, Elliot et al. (2011) found a negative relationship between avoidance goal and subjective well-being. In various similar studies, it is suggested that self-regulation is strongly related with well-being (Burton et al. 2006; Hong et al. 2004; Horvath and McColl 2013; Simon and Durand-Bush 2009; Skowron et al. 2003; Wrosch et al. 2003). In the light of these findings, it can be concluded that students who monitor, control, and regulate their actual behaviors in order to achieve their goals are happier and much more satisfied than students who do not regulate their actual behaviors.

It is also possible, however, that there are indirect relations between self-regulation, negative and positive affect, and academic satisfaction, mediated through a third variable. One possible mediator in these relations is procrastination, at least in part. Previous research findings showed that procrastination is related with self-regulation, subjective well-being, and academic performance (Balkis and Duru 2009; Hong et al. 2004; Horvath and McColl 2013; Simon and Durand-Bush 2009). In a similar way, procrastination is also related to less satisfaction with general life (Hinsch and Sheldon 2013; Steel 2010) and academic life (Balkis 2013; Chow 2011). Consequently, it is expected that procrastination might mediate relations between self-regulation, negative affect, and academic life satisfaction. In other words, low self-regulation and high procrastination together might increase to experience higher negative feeling and lower academic satisfaction. In a similar way, it is expected that procrastination might mediate relations between positive affect, negative affect, and academic life satisfaction. In other words, high negative feelings and procrastination together might ease the experience of lower positive mood and academic satisfaction.

The current study

Although extensive research has been carried out on the relationships between procrastination, self-regulation, academic life satisfaction, and affective well-being, previous studies have examined the relations between these variables separately. An integrated examination of these factors in a single study may provide us the beneficial information about the nature of the relationship among these variables. In addition, there are two different views about the role of self-regulation failure in the development of procrastination. A few authors (Ferrari 2001; Howell and Watson 2007; Rabin et al. 2011; Senécal et al. 1995) approach procrastination as a form of underregulation. Procrastinators fail setting standards, monitoring performance, and maintaining motivation. Others believe that procrastinators engage in misregulation (Baumeister and Heatherton 1996; Sirois and Pychyl 2013; Tice et al. 2001). In other words, procrastination functions as an emotional regulation strategy engaging to fix the bad moods caused by the task at hand. Although the role of self-regulation failure in terms of procrastination is well-documented in the existing literature, it is not clear which form of self-regulation failure is procrastination. There are two primary aims of the current study. The main aims of this study are to test the possible effect of both forms of self-regulation (misregulation and underregulation) on procrastination and fill out the gap in the literature by using two structural models. Also, another aim of this study is to understand the mediate effect of procrastination

on relationships between negative affect, self-regulation, positive affect, and academic satisfaction. In accordance with the literature, the following hypotheses have been generated: (1) whether self-regulation would predict procrastination (negatively), negative affect (negatively), positive affect (positively), and academic life satisfaction (positively); (2) whether negative affect would predict procrastination (positively), positive affect (negatively), and academic life satisfaction (negatively); and (3) whether procrastination would mediate the relationship between self-regulation, positive affect, negative affect, and academic life satisfaction; and the relationship between negative affect, positive affect, and academic life satisfaction.

Method

Participants

This study included a total of 328 undergraduate students (76.8 % women and 23.2 % men). Participants' age ranged from 19 to 34 years with a mean of 21.29 (SD=1.38) for total samples. Students participating in this study are from the departments of counseling and guidance, early childhood education, social studies education, science education, and elementary education in Pamukkale University in Turkey.

Procedure

Permissions for this study were collected from the related departments in the university. Students were invited to participate in the study anonymously and completed a questionnaire booklet containing the measures described above as well as a short demographics measure. Instructions were presented at the top of each separate measure indicating how it should be completed. Completed questionnaires were returned to the researchers.

Measures

Demographic information sheet

Demographics information sheet prepared for this study includes personal information such as gender, major field, and age.

Tuckman Procrastination Scale (TPS)

The TPS is a 16-item self-report measure of procrastination (Tuckman 1991). Participants indicate the extent to which they agreed with the statement such as "When I have a deadline, I wait until the last minute." The statements are rated on a four-point Likert scale (*1 = strongly agree*, *4 = strongly disagree*). Tuckman (1991) reports adequate internal consistency of the measure with a coefficient alpha of 0.86. Özer et al. (2009b) examined psychometric characteristics of TPS for the Turkish population. The Turkish version of TPS with a new scoring system with a five-point Likert scale (*1 = strongly agree*, *2 = agree*, *3 = unsure*, *4 = disagree*, *5 = strongly disagree*) was used. Özer et al. (2009b) reported that the internal consistency coefficient for the TPS was α=0.90, and 4 weeks test-retest reliability correlation for the TPS was 0.80.

Self-Regulation Scale (SRS)

The SRS is a nine-item self-report measure of self-regulation (Tuckman 2002). Participants indicate the extent to which they agreed with the statement such as "I create and reach my goals and I organize my time." The statements are rated on a four-point Likert scale with response options of never, sometimes, frequently, and always. Tuckman (2002) reported adequate internal consistency of the measure with a coefficient alpha of 0.88. Duru et al. (2009) examined psychometric characteristics of SRS for the Turkish population. Duru et al. (2009) reported that SRS had one factor, accounting for 36.6 % of the common variance (eigenvalue=2.9). The internal consistency coefficient alpha was found to be 0.73 for Turkish samples.

Academic life satisfaction (ALS)

Academic Satisfaction Scale (Schmitt et al. 2008) was used to assess participants' academic life satisfaction. The scale includes five items designed to assess students' academic satisfaction. A sample item is "I'm satisfied with the extent to which attending this school will have a positive effect on my future career, and I am happy with the amount I learn in my classes." Students must indicate the level of agreement with each item, which were scored on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The authors reported adequate internal consistency of the measure with a coefficient alpha of 0.81(Schmitt et al. 2008). Balkis (2013) examined the psychometric characteristics of ALS and reported that the internal consistency coefficient for the ALS was α=0.86.

Positive and Negative Affect Schedule (PANAS) scales

Affective well-being was determined with the PANAS scales. The emotional state of participants was assessed by the PANAS scales developed by Watson et al. (1988). The PANAS scales consists of 10 items assessing positive affectivity and 10 items assessing negative affectivity, rated on a five-point Likert scale. An internal consistency reliability of 0.88 for NA and 0.85 for PA and a test-retest reliability of 0.47 for both positive and negative affectivity have been reported by Watson et al. (1988). Gençöz (2000) examined the psychometric characteristics of PANAS scales for the Turkish population. Gençöz (2000) reported that the internal consistency coefficient for the PA was α=0.80 and for the NA α=0.85.

Data analyses

The proposed theoretical models (Figs. 1 and 2) were tested via latent variable path analysis using maximum likelihood parameter estimation with AMOS 7 (Arbuckle 2006). Two-step approaches to structural equation modeling were used in this study. Initially, the item parceling method was used to structure the measurement model. Then, the measurement model was tested by using confirmatory factor analysis in order to test the relations between latent variables and their indicators. Finally, structural models that are based on hypotheses were estimated. The fit of the model was assessed by considering the model's chi square (χ^2), root mean square of error approximations (RMSEA), and fit indices, comparative fit index (CFI), incremental fit index (IFI), goodness of fit index (GFI), and normed fit index (NFI). For each of these fit indices, values greater than 0.95 indicate very good fits. Also, standardized root

mean square residual (SRMR) values ≤0.05 and RMSEA values ≤0.08 and a nonsignificant χ^2 ($p>0.05$) and χ^2 ratio of being below the suggested 2:1 ratio represent acceptable model fit (Fan and Sivo 2005; Kline 2005).

Results

Test of the measurement model

Because all latent variables in the model were one-dimensional, two parcels were created for them except for academic satisfaction. The academic satisfaction has only five items, and these items were used as indicators of academic satisfaction latent construct. Descriptive statistics and correlations among the observed variables are presented in Table 1.

The proposed measurement model was tested by confirmatory factor analyses. The results indicated that the measurement model was accepted as adequate: $\chi^2(55, N=328)=83.743$ and $p<0.01$. Furthermore, the χ^2 ratio was below the suggested 2:1 ratio [($\chi^2/df=1.523$); GFI=0.96, RMSEA=0.040 (0.021–0.057), SRMR=0.030, CFI=0.99, Tucker-Lewis index (TLI)=0.98, IFI=0.99, NFI=0.96]. All of the loadings of the measured variables on the latent variables were statistically significant. Standardized values ranged from 0.64 to 0.88, $p<0.001$. Correlations among latent variables are presented in Table 2.

Test of the structural models

Procrastination as underregulation form of self-regulation failure

The results indicated that the model was accepted as adequate: $\chi^2(58, N=328)=89.593$ and $p<0.01$. Furthermore, the χ^2 ratio was below the suggested 2:1 ratio [($\chi^2/df=1.545$); GFI=0.96, RMSEA=0.041 (0.023–0.057), SRMR=0.043, CFI=98, TLI=0.98, IFI=98, NFI=0.95].

The results showed that self-regulation directly predicted procrastination ($\beta=-0.69$, $p<0.001$) and positive affect ($\beta=0.49$, $p<0.001$). The results showed that procrastination predicted negative affect ($\beta=0.24$, $p<0.05$) and academic life satisfaction ($\beta=-0.32$, $p<0.01$). Procrastination did not predict positive affect ($\beta=-0.040$, $p>0.05$). The results also showed that self-regulation predicted negative affect and academic life satisfaction via the mediation of procrastination (Table 3). The indirect effect of self-regulation on negative affect ($\beta=-0.17$, $p<0.05$) and academic life satisfaction ($\beta=0.22$, $p<0.05$) was significant. In other words, procrastination fully mediated the relations between self-regulation, negative affect, and academic life satisfaction. Self-regulation accounts for 47 % of the variance in procrastination. Self-regulation and procrastination together account for 11 % of the variance in negative affect, 22 % of the variance in positive affect, and 12 % of the variance in academic life satisfaction. The result of the path analysis is shown in Fig. 3.

Procrastination as misregulation form of self-regulation failure

The result of path analysis is shown in Fig. 4. The results indicated that the model was accepted as adequate: $\chi^2(39, N=328)=59.966$ and $p<0.05$. Furthermore, the χ^2 ratio was

Table 1 Bivariate correlations among variables, means, and standard deviations, and range (N=328)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1—SRP1	–	0.571**	−0.457**	−0.423**	0.270**	0.227**	−0.239**	−0.217**	0.126*	0.137*	0.137*	0.147*	0.120*
2—SRP2		–	−0.374**	−0.362**	0.354**	0.370**	−0.097	−0.139*	0.136*	0.112*	0.154*	0.188**	0.173**
3—PRC1			–	0.610**	−0.197**	−0.172**	0.183**	0.194**	−0.197**	−0.230**	−0.237**	−0.269**	−0.232**
4—PRC2				–	−0.216**	−0.190**	0.251**	0.224**	−0.245**	−0.111*	−0.190**	−0.190**	−0.156**
5—PAP1					–	0.741**	−0.094	−0.119*	0.141*	0.091	0.125*	0.093	0.124*
6—PAP2						–	−0.109*	−0.149*	0.190**	0.098	0.136*	0.137*	0.179**
7—NAP1							–	0.775**	−0.151**	−0.143**	−0.164**	−0.175**	−0.116*
8—NAP2								–	−0.099	−0.155**	−0.158**	−0.162**	−0.126*
9—AS1									–	0.558**	0.618**	0.616**	0.608**
10—AS2										–	0.535**	0.523**	0.449**
11—AS3											–	699**	0.682**
12—AS4												–	0.680**
13—AS5													–
M	11.94	12.18	18.63	17.91	17.46	17.35	11.57	11.11	3.38	3.35	3.36	3.40	3.54
SD	1.94	2.223	4.62	4.35	3.14	3.34	3.38	3.48	0.98	0.93	0.98	0.96	0.99
Range	6–16	5–16	8–33	8–25	7–25	5–25	5–21	5–24	1–5	1–5	1–5	1–5	1–5

Notes: SRP1–SRP2 = two parcels from SRS, PRC1–PRC2 = two parcels from TPS, PAP1–PAP2 = two parcels from the positive affect subscale of PANAS, NAP1–NAP2 = two parcels from the negative affect subscale of PANAS, AS1–AS5 = items of ASS

*p<0.05, **p<0.001

Table 2 Correlations between latent variables

	1	2	3	4	5
1—Self-regulation	–	−0.688***	0.462***	−0.266***	0.243***
2—Procrastination		–	−0.286***	0.304***	−0.343***
3—Positive affect			–	−0.155*	0.193**
4—Negative affect				–	−0.210***
Academic satisfaction					–

***p<0.001, **p<0.01, *p<0.05

below the suggested 2:1 ratio [(χ^2/df=1.538); GFI=0.97, RMSEA=0.041 (0.018–0.060), SRMR=0.035, CFI=99, TLI=0.98, IFI=99, NFI=0.96].

Results showed that negative affect directly predicted procrastination (β=0.31, p<0.001). Procrastination directly predicted positive affect (β=−0.28, p<0.001) and academic life satisfaction (β=−0.31, p<0.001). The results also showed that negative affect predicted positive affect and academic life satisfaction by mediation of procrastination (Table 4). The indirect effect of negative affect on positive affect (β=−0.09, p<0.001) and academic life satisfaction (β=−0.10, p<0.001) was significant. These findings suggested that procrastination fully mediated the relations between negative affect, positive affect, and academic life satisfaction. Negative affect accounted for 10 % of the variance in procrastination. Negative affect and procrastination together accounted for 9 % of the variance in positive affect and 13 % of the variance in academic life satisfaction.

Discussion

This integrative study was designed to examine the effects of two forms (underregulation and misregulation) of self-regulation failure in procrastination and to investigate the possible effect of procrastination on academic life satisfaction and affective well-being in the framework of structural equation model (SEM). The results of the SEM analyses showed that higher levels of self-regulation are related to lower levels of procrastination and negative affect and also higher levels of positive affect and academic life

Table 3 Standardized direct, indirect, and total effects

	Direct effect	Indirect effect	Total effect
Self-regulation→procrastination	−0.687**	–	−0.687**
Self-regulation→positive affect	0.493**	−0.028 NS	0.465**
Self-regulation→negative affect	−0.107 NS	−0.166*	−0.273**
Self-regulation→academic satisfaction	0.041 NS	0.221*	0.261**
Procrastination→positive affect	−0.040 NS	–	−0.040 NS
Procrastination→negative affect	0.242*	–	0.242*
Procrastination→academic satisfaction	−0.321**	–	−0.321**

**p<0.01, *p<0.05, NS=p>0.05

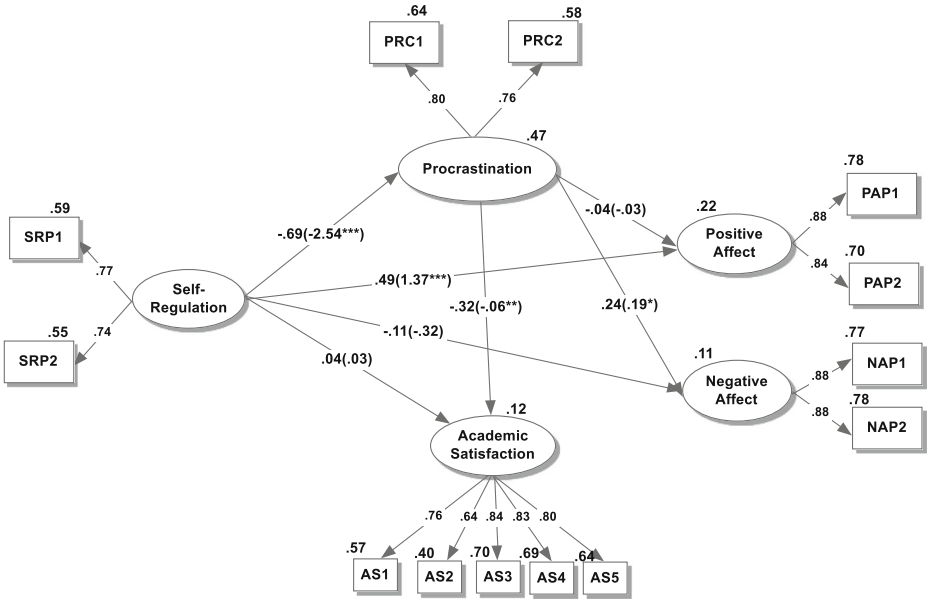

Fig. 3 The results of SEM analyses of structural model 1

satisfaction. In addition, the results of the analyses confirmed that higher levels of negative affect are related to higher levels of procrastination, lower levels of positive affect, and lower levels of academic life satisfaction. The SEM analyses also verified that procrastination plays a mediator role on the relationships between negative affect, self-regulation, positive affect, and academic life satisfaction.

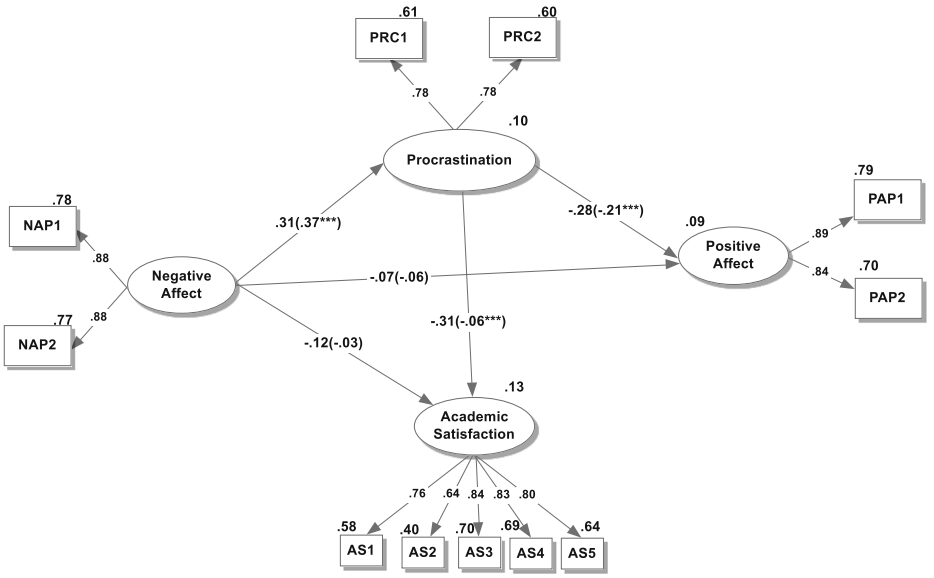

Fig. 4 The results of SEM analyses of structural model 2

Table 4 Standardized direct, indirect, and total effects

	Direct effect	Indirect effect	Total effect
Negative affect→procrastination	0.310***	–	0.310***
Negative affect→positive affect	−0.066 NS	−0.086**	−0.152*
Negative affect→academic satisfaction	−0.115 NS	−0.096***	−0.211**
Procrastination→positive affect	−0.278**	–	−0.278*
Procrastination→academic satisfaction	−0.311***	–	−0.311**

***$p<0.001$, **$p<0.01$, *$p<0.05$, NS=$p>0.05$

Procrastination as underregulation form of self-regulation failure

The results supported hypothesis 1, which confirmed that students with higher levels of self-regulation would report lower levels of procrastination and higher levels of positive affect and academic life satisfaction. The SEM analyses indicated that self-regulation predicted procrastination (negatively) and positive affect (positively); however, self-regulation did not significantly predict academic life satisfaction and negative affect. These findings supported the view that procrastination is a reflection of the absence of self-regulation (Ferrari 1991; Howell and Watson 2007; Rabin et al. 2011; Senécal et al. 1995). They pointed out that students who reported high levels of self-regulation are less likely to delay starting/completing tasks as the deadlines draw close. This finding corroborated the ideas of Zimmerman and Risemberg (1997) who state that:

> Self-regulated learners know how to manage their time because they are aware of deadlines and how long it will take to complete each assignment. They prioritize learning tasks, evaluating more difficult from easier tasks in terms of the time required to complete them. They are aware of the need to evaluate how their study time is spent and to reprioritize as necessary (as cited in Lynch and Dembo 2004, p. 4).

Our findings also show that students with a high level capacity of self-regulation may experience more positive affect due to accomplishing their assignments purposefully. This finding is in agreement with the findings of Buckner et al. (2003), who indicated that youth with good self-regulatory skills show great emotional well-being and mental health. For instance, a student with a high level of self-regulation would tend to start or complete the assignments and tasks in time, because he/she is likely to use the self-regulation strategies more, such as time management, organizing, planning, and prioritizing, and also demonstrates effort and persistence in completing difficult tasks. Therefore, he/she is likely to experience positive emotions such as being active, proud, strong, attentive, etc. In addition, previous studies found that students with high levels of self-regulation reported lower levels of procrastination (Grunschel et al. 2012; Rakes and Dunn 2010; Senécal et al. 1995; Wolters 2003) and reported high levels of well-being (Burton et al. 2006; Hong et al. 2004; Hofer et al. 2011; Horvath and McColl 2013; Skowron et al. 2003; Simon and Durand-Bush 2009; Wrosch et al. 2003; Özer et al. 2014). The results also show that students with higher levels of procrastination are more likely to experience negative emotions and be less satisfied with their academic life. These findings are in line with the previous findings which confirmed that procrastination is negatively related to well-being (Caldwell and Mowrer 1998; Çapan 2010; Deniz 2006; Kağan 2009; Milgram and Toubiana 1999; Rothblum et al. 1986; Sarid and Peled

2010; Sirois 2007, 2014; Sirois and Tosti 2012; Stead et al. 2010; Steel 2007, 2010; Stöber and Joormann 2001; Tice and Baumeister 1997; Van Eerde 2003) and academic life satisfaction (Balkis 2013; Chow 2011). They suggest that students who do not delay gratification, tolerate frustration, evaluate time required to complete assignments, or persist in completing tasks are more likely to tend to put off his/her assignment and task. Therefore, she/he would be less satisfied with academic life and experience negative emotions such as frustration, stress, being upset, etc. Schouwenburg et al. (2004) stated that procrastinators suffer from the negative consequences of postponing behaviors such as negative affect and decreased positive affect. Briefly, the current study produced results which corroborate the findings of a great deal of the previous work in this field. It shows that having poor self-regulation skills play an important role in relation to procrastination, academic life satisfaction, and affective well-being. In other words, the absence or lack of self-regulation skills is more likely to result in procrastination and lower levels of affective well-being for college students.

Procrastination as misregulation form of self-regulation failure

Similar to hypothesis 1, the results of the current study also supported hypothesis 2, which confirmed that students with higher levels of negative affect would report higher levels of procrastination and lower levels of positive affect and academic life satisfaction. The current finding suggests that students who experience negative emotions such as irritability, fear, guilt, nervousness, and being upset are more likely to procrastinate. This outcome is in agreement with the findings of Milgram et al. (1992), which indicated that students with high test anxiety tended to procrastinate more compared to students with low test anxiety. Data from the current study also suggested that procrastination reduces the effect of negative feelings on positive affect and academic life satisfaction. This was also consistent with Sirois and Pychyl's (2013) explanation that mood repair in the short run can be seen as self-regulatory failure in procrastination. This finding supports the view that procrastination functions as an emotional regulation strategy in order to fix the bad moods caused by the task at hand (Baumeister and Heatherton 1996; Sirois and Pychyl 2013; Tice et al. 2001). Regarding the conclusions of this study, it can be said that procrastination may be a misregulation form of self-regulation failure.

The results also supported hypothesis 3, which confirmed that procrastination would have a mediator role in the relationships between self-regulation, positive affect, negative affect, and academic life satisfaction. The result showed that self-regulation predicted negative affect and academic life satisfaction via the mediation of procrastination. In other words, procrastination fully mediated the relations between self-regulation, negative affect, and academic life satisfaction. Higher levels of self-regulation reduced procrastination; in turn, low procrastination reduced negative feelings while increasing academic life satisfaction. As suggested by Howell and Watson (2007), the strong link between procrastination and poor self-regulation skills as a function of disorganization might support the notions that procrastination may be viewed as self-regulation failure. These findings are in line with the previous research findings, which confirmed that procrastination is not only related to well-being (Çapan 2010; Kağan 2009; Rothblum et al. 1986; Sarid and Peled 2010; Sirois 2007, 2014; Sirois and Tosti 2012; Stead et al. 2010; Steel 2007, 2010) but also to academic life satisfaction (Balkis 2013; Chow 2011). In addition, the results also showed that negative affect predicted positive affect and academic life satisfaction by the mediation of procrastination. These findings suggested that procrastination fully mediated the relations between negative affect, positive affect, and academic life satisfaction. In other words, the effect of negative affect on positive feelings and academic life

satisfaction may change compared to the level of procrastination. Higher levels of negative affect may increase procrastination; in turn, increased procrastination can reduce the effect of negative affect on positive feelings and academic life satisfaction. As suggested by Chiarrocchi (2001), unpleasant tasks usually put people in a bad mood. The link between procrastination and negative mood might support the notions that procrastination may be viewed as a misregulation form of self-regulation failure to control negative feelings.

The current findings indicate that negative affect can be influenced by procrastination and procrastination can be influenced by negative affect. The next step in understanding these findings is to examine the relationship between procrastination and negative affect longitudinally. Although the mediational effect of procrastination was strong, it is not clear how this relationship will turn out in the long run. Does procrastination at a previous time point mediate the relationship between negative affect at a previous point and positive affect and academic life satisfaction at a concurrent time? Or does procrastination mediate the relationship between negative affect, positive affect, and academic life satisfaction across time? These questions can be answered only when longitudinal data on these relationships can be collected and analyzed.

Briefly, the present study produced results which corroborate the theoretical explanations and the findings of a great deal of the previous work in this field. The current study showed that the absence or lack of self-regulation skills has an important role in relation to procrastination, academic life satisfaction, and affective well-being. In other words, the absence or lack of self-regulation skills is more likely to result in procrastination and lower levels of affective well-being for college students. This study also shows that procrastination mediates the relations among negative affect, positive affect, and academic life satisfaction. To put it in a different way, procrastination may function as a mood repair strategy. In the context of all the findings of the present study, there seems to be some evidence indicating procrastination to be a significant sign of the forms of self-regulation failure. Baumeister (1997) warned that it is difficult to distinguish whether or not procrastination is the underregulation or the misregulation form of self-regulation failure. The findings of the present study indicate that poor self-regulation, as an indicator of underregulation, accounts for the variance in procrastination more than misregulation. It has also confirmed the view of Baumeister (1997) that states “underregulation appears to be an important factor in procrastination” (p. 168). Consequently, it can be concluded that procrastination is the underregulation form rather than the misregulation form of self-regulation failure.

Conclusion

The current study attempted to examine the role of self-regulation failure in the development of procrastination. In addition, it also aimed to investigate the effects of procrastination on affective well-being and academic life satisfaction. The most obvious conclusion emerging from this study is that the absence or lack of self-regulation skills, as an indicator of underregulation, plays a significant role in procrastination among college students. Either procrastination is an underregulation or misregulation; it has a negative impact on students’ affective well-being. The present study confirms the previous results and makes several contributions to the current literature. The findings of this study contributed to the growing body of literature suggesting that improving self-regulation skills will provide adaptive strategies to cope with procrastination. Results revealed that self-regulation is not only an academic skill, but also a life skill, which affects the affective well-being of students.

The findings of this study have a number of important implications for future practices. The current study indicates that procrastination results from poor self-regulation as an indicator of underregulation and adversely affects students' affective well-being and academic life satisfaction. The results showed that higher levels of self-regulation reduced procrastination; in turn, low procrastination reduced negative feelings while increasing academic life satisfaction. This result suggested that improving self-regulation skills, including cognitive, affective, and behavioral components, can facilitate directly to cope with procrastination and indirectly increase the levels of affective well-being of students. In addition, the results also revealed that higher levels of negative affect increase procrastination; in turn, increased procrastination reduced the effect of negative affect on positive feelings and academic life satisfaction. As pointed out by Ciarrocchi (2001), doing unpleasant tasks generally puts people in a bad mood and procrastination may function as a form to control negative feelings. In other words, as identified by Steel (2007), negative affect and poor mood do not only stem from procrastination but also lead to it. This result suggested that the students who have higher levels of negative affect may need some effective strategies to manage their negative feeling. Improving emotional regulation skills can facilitate to cope with procrastination, in turn, increase the levels of affective well-being of students. According to Doerr and Baumeister (2010), the lack of motivation, deficiencies of setting standards, low self-monitoring, and low capacity for change lead to underregulation, whereas misregulation occurs when one takes ineffective actions for setting standards, maintaining motivation, monitoring performance, and altering his/her behavior. Information about both underregulation and misregulation can be used to develop a targeted intervention aiming to reduce procrastination and increase the affective well-being of students. A counselor or a psychologist who is working with students who procrastinate can incorporate various self-regulatory strategies such as goal setting, self-monitoring, self-evaluation, time structuring, designing priorities, maintaining motivation, and cognitive restructuring strategies into his/her treatment.

Finally, the current study is subject to limitations. Therefore, the results of this study should be interpreted accordingly. The findings and predictions are based on the SEM analyses and should be interpreted accordingly. Another limitation related to this research is its cross-sectional design. Future research could offer a more detailed picture about the relationships between these variables by using longitudinal methods. In addition, a qualitative research design such as in-depth interviews or a case study may be helpful in better understanding the role of self-regulation in relation to procrastination, academic life satisfaction, and affective well-being. Finally, students' affective well-being was determined by using PANAS in this study. Sometimes a domain-specific measure provides a clearer picture rather than a general measure (Balkis 2013; Wallston et al. 1976). Using domain-specific measures of affective well-being (e.g., task or assignment-related affective well-being) may be helpful to understand the relationship between affective well-being and procrastination.

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