
PROCRASTINATION AMONG ADULTS: THE ROLE OF SELF-DOUBT, FEAR OF THE NEGATIVE EVALUATION, AND IRRATIONAL/RATIONAL BELIEFS

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Abstract

Procrastination is often associated with negative outcomes such as poor performance and well-being. Theoretical models suggest that individuals with an uncertain self-concept may be more prone to procrastination due to their fear of failing to meet the required standard. To investigate this issue from a cognitive perspective, a cross-sectional study was conducted to examine the relationships among self-doubt, fear of negative evaluation, procrastination, and irrational/rational beliefs. The study involved 344 highly educated adults (65.4% female, $M = 37.51$ years, $SD = 8.53$, range 21-63). Participants completed a questionnaire booklet that included several measures, including the Self-doubt Scale, the Procrastination Scale, the Fear of Negative Evaluation Scale, and the Irrational/Rational Beliefs Scale. The findings from the mediation analysis indicate that the influence of self-doubt on procrastination is partially mediated by fear of negative evaluation. Furthermore, the indirect effect of self-doubt on procrastination through the mediation of fear of negative evaluation is contingent upon the level of irrational beliefs. These results suggest that irrational beliefs may exacerbate the detrimental impact of self-doubt on procrastination by amplifying the role of fear of negative evaluation. Furthermore, the strength of the direct effect of self-doubt on procrastination depends on the level of rational belief, indicating that rational belief may serve as a protective variable in the relationship between self-doubt and procrastination. The present findings underline interventions to strengthen individuals' rational beliefs and modify their irrational beliefs, which can play a fundamental role in overcoming procrastination in the adult population.

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Procrastination has attracted attention as a research topic in many fields due to its negative effect on the psychological health and performance of the individual. Procrastination, which includes actions and behaviors that negatively affect productivity, can be seen frequently in the normal and student population. For example, Harriott and Ferrari (1996) reported that 15-20% of adults feel uncomfortable because of their procrastination. Hen and Goroshit (2018), on the other hand, found that 25% of respondents (their age ranged from 26 to 70) reported high procrastination in four or more life domains and 40% in one to three life domains. Previous studies have shown that procrastination is associated with stress (Sirois, 2007, 2014), maladaptive coping style, acute health problems, lack of health-supportive behaviors (Sirois, 2007, 2015), low overall health satisfaction (Codina et al., 2020), time orientation (Ferrari & Díaz-Morales, 2007) as well as sleep disturbance, insomnia, depression, tension and fatigue (Hairston & Shpiltalni, 2016).

Although there have been numerous studies examining procrastination among university students (Steel, 2007), there is a relative dearth of research on this topic in adult populations. Steel's (2007) meta-analytic and theoretical review of procrastination aimed to provide a comprehensive overview of the literature on this behavior, focusing on identifying key factors associated with procrastination. The study analyzed over 691 studies, examining a wide range of variables, including personality traits, motivational factors, and cognitive and affective processes. While Steel (2007) did analyze the effect of age on procrastination at the group level, the results were not statistically significant, likely due to range restriction, as the sample had an average age of 21.8 with a standard deviation of 4.6, suggesting a homogeneity of age that may have hindered the detection of age-related differences in procrastination. Therefore, there is a pressing need for further research on procrastination in adult populations beyond the university context. Although some studies have investigated the prevalence and types of procrastination behaviors in adult samples (Díaz-Morales et al., 2006; Ferrari, O' Callaghan, & Newbegin, 2005; Ferrari et al., 2009; Przepiorka et al., 2019), as well as the activities commonly postponed (Hen & Goroshit, 2018) and certain demographic variables (Steel & Ferrari, 2013), the underlying factors contributing to procrastination behavior in adults require further investigation. Understanding these factors and the mechanisms involved can provide valuable insights into the nature of procrastination behavior and aid clinicians in helping adults who struggle with procrastination. Hence, this study aims to explore the cognitive and behavioral variables that may contribute to

procrastination in adults from a cognitive-behavioral perspective, building on previous research conducted on procrastination in university samples.

The initial explanations for the occurrence of procrastination were made by clinicians based on their clinical observations (Ferrari et al., 1995). For example, Burka and Yuen (2008) explained the occurrence of procrastination behavior by basing it on parents' faulty parenting practices. Children who grow up with faulty parenting practices struggle to gain the appreciation of others. Over time, this need for approval can become entrenched and easily turn into a fear of failure. However, based on their clinical observations, Burka and Yuen (2008) also explained the occurrence of procrastination based on self-concept. According to Burka and Yuen (2008), individuals with a high level of procrastination base their self-worth on experiences of success and failure. These individuals believe that their sense of worthiness is a reflection of their ability to complete a task successfully. When they fail at something, they do not only think they have failed at that work, they also see themselves as unsuccessful individuals. These people have a strong fear of being perceived as inadequate by others or feeling inadequate (Burka & Yuen, 2008). As a natural consequence of these and similar considerations, individuals who doubt their abilities and performance to accomplish a task experience an intense fear of failure. Herein, procrastination has a protective function for these individuals in order not to damage their belief that they are successful. Similarly, Ferrari et al. (1995) state that if a person has doubts about his or her ability to accomplish a task, this doubt may increase the likelihood of experiencing a fear of failure, which increases the risk of injury to the ego. Therefore, the individual may delay fulfilling the required duties and responsibilities to protect his/her self from being hurt.

A number of studies have been conducted to test the afore-mentioned explanations based on clinical observations that have shown that procrastination is positively associated with fear of failure (Haghbin et al., 2012; Onwuegbuzie & Collins, 2001; Özer et al., 2009; Schouwenburg, 1992; Solomon & Rothblum, 1984; Steel, 2007) and negatively correlated with self-worth (Dinnel et al., 2002; Feick & Rhodewalt, 1997; Ferrari, 2000; Ferrari & Diaz-Morales, 2007; Pychyl et al., 2002). For example, Feick and Rhodewalt (1997) stated that individuals who avoided facing an unsuccessful situation by exhibiting procrastination behavior in situations where there was a possibility of failure had higher self-esteem than those who did not use any self-handicapping strategy. In another study, Duru and Balkis (2014) reported that the undergraduates who had self-doubt postponed their academic duties and responsibilities. Finally, Balkis and Duru (2019) found that the relationship between self-doubt and procrastination was partially mediated by fear of failure.

In sum, existing research and theoretical explanations agree that self-evaluation and fear of failure play a critical role in the occurrence of procrastination. However, previous studies examined the direct predictive power of self-evaluation and fear of failure on procrastination separately, and the functioning of these two

variables in procrastination was not sufficiently tested together. To the best knowledge of the researchers, there is only one study in the existing literature investigating the association between procrastination, self-doubt and fear of failure, and this study was conducted only on university students (Balkis & Duru, 2019). Therefore, it remains unclear whether the theoretical explanations for the formation and functioning of procrastination also apply to the adult sample. Another important point to be clarified is the relationship between procrastination and the main source of the fear of failure. In the current literature, some authors have emphasized that the fear of failure is fed by the fear of negative evaluation (Burkan and Yuen, 2008; Saddler and Buley, 1999; Steel, 2007). For example, Burka and Yuen (2008) state that procrastination stems from the fear of being judged based on one's performance. Similar to this explanation, Saddler and Buley (1999) argue that negative evaluation anxieties form the basis of fear of failure. In the light of these explanations, one might expect that the fear of negative evaluation plays a role in the relationship between self-doubt and procrastination. Indeed, previous studies have suggested that procrastination is associated with the fear of negative evaluation (Bui, 2007; Steel, 2007). In order to clarify this uncertainty, the association of procrastination with self-doubt and the fear of negative evaluation will be tested in an adult sample in this study.

Rational Emotional Behavior Therapy (REBT) and Procrastination

According to REBT, people are born with the potential for rational and irrational beliefs. Rational beliefs include ways of thinking that help achieve the goals chosen for happiness and sustaining life while irrational beliefs include thoughts that interfere with achieving goals and confusing work. REBT assumes that our beliefs mediate the relationship between the events we experience and our emotions and behaviors (Davit et al., 2010). It also conceptualizes irrational beliefs as a cognitive fragility factor and rational beliefs as a resilience factor. Addressing procrastination in the REBT perspective, Ellis and Knaus (1977) stated that irrational beliefs played a key role in the occurrence of procrastination. They stated that self-downing, low frustration tolerance, and hostility beliefs played an important part in the occurrence of procrastination. They also reported that the absolute demandingness of individuals with procrastination to do everything well prevented them from doing their duties or responsibilities on time. In this vein, REBT proposes that the core irrational belief that drives procrastination is the belief that "I must do well" to prove that "I am a worthwhile person" (Beswick et al., 1988, p. 208).

Regarding the function of procrastination, Ellis and Knaus (1977) state that procrastination has a defensive behavior. As a defensive behavior, procrastination reflects the fear of failure and serves as a protective function so that the individual does not face the fear. In this context, Rorer (1983) states that the irrational belief leading to procrastination is that "you must do well, and that if you don't, you're no

good, it is better to procrastinate than to risk the possibility of finding out that you are worthless" (p. 1). Also, there are a great number of studies attempted to investigate the association between procrastination and irrational beliefs (Balkis & Duru 2018, 2019; Beswick et al. 1988; Bridges & Roig 1997; Ferrari & Emmons 1994; Harrington 2005; Steel 2007). The common finding of these studies is that procrastination is positively related to irrational beliefs. For example, Balkis and Duru (2019) examined the relationship between self-doubt, rational and irrational beliefs, fear of failure, and procrastination among Turkish undergraduate students. The findings indicate that that irrational beliefs moderated the indirect predictive power of self-doubt on procrastination via fear of failure.

In the existing literature, many studies have examined the relationship between procrastination and irrational beliefs in the literature, the relationship between rational beliefs and procrastination has not been adequately addressed. In addition, REBT conceptualizes rational beliefs as a cognitive resilience factor (David et al., 2010). Previous findings, in the college sample, have shown that rational beliefs play a moderating role in the relationship between procrastination and academic satisfaction (Balkis, 2015), self-downing (Balkis & Duru, 2018), and fear of failure (Balkis & Duru, 2019). However, whether rational beliefs play a similar role in the adult population remains unclear. Therefore, clarification of this ambiguity may contribute to the theoretical explanations of REBT procrastination and, at the same time, provide clinicians with important data in the process of helping adults suffering from procrastination.

Current Study

This study aims to achieve two main objectives. Firstly, we will examine the role of fear of negative evaluation in the relationship between self-doubt and procrastination. Therefore, our study aims to provide additional evidence for the theoretical explanations of Burka and Yuen (2008) and Ferrari et al. (1995), who argue that individuals who doubt their abilities and performance in completing a task experience intense fear of failure, which leads them to postpone required tasks and responsibilities. Previous studies in the existing literature have shown that procrastination is associated with fear of failure (Haghbin et al., 2012; Özer et al., 2009; Steel, 2007) and self-doubt (Duru & Balkis, 2014; Balkis & Duru, 2018, 2019). However, Balkis and Duru (2019) reported that fear of failure plays a partial mediating role in the association between self-doubt and procrastination in university samples. Although Burka and Yuen (2008) and Ferrari et al. (1995) emphasized the role of fear of failure in the association between both variables, Saddler and Buley (1999) argued that negative evaluation anxieties formed the basis of fear of failure. Similarly, Steel (2007) explained that fear of failure was related to the anxiety of negative evaluation, while Burka and Yuen (2008) stated that procrastination stemmed from the fear of being judged on one's performance. Nevertheless, previous

findings in the literature indicated that procrastination was associated with the fear of negative evaluation (Çelik & Odacı, 2015; Bui, 2007; Sadler & Buley, 1999). Based on these theoretical explanations and research findings, our first hypothesis is that self-doubt is associated with fear of negative evaluation and, in turn, fear of negative evaluation is associated with procrastination.

Secondly, we aimed to examine whether the indirect predictive power of self-doubt on procrastination via the fear of negative evaluation varies based on the level of rational and irrational beliefs. Previous studies have shown that self-doubt and procrastination are positively associated with irrational beliefs (Ferrari & Emmons, 1994; Harrington, 2005; Steel, 2007) and negatively associated with rational beliefs (Balkis, 2015; Balkis & Duru, 2018, 2019, 2021). However, these findings have shown that the indirect predictive power of self-doubt on procrastination through fear of failure varies depending on the level of rational and irrational belief. Drawing on previous research, it is plausible to expect that both rational and irrational beliefs have a significant impact on the relationship between self-doubt, the fear of negative evaluation, and procrastination. Therefore, the second hypothesis of this study posits that the indirect effect of self-doubt on procrastination via the fear of negative evaluation will be more pronounced when irrational beliefs are high. Finally, the third hypothesis predicts that the indirect effect of self-doubt on procrastination via the fear of negative evaluation will be weaker in situations where rational beliefs are high..

Method

Participants

The current study consists of 344 adults. Among the participants, 119 were men (34.6 %), and 225 were women (65.4%). The mean age was 37.51 years ($SD = 8.53$, range 21-63); 73.9% were married, and 26.1 % were single. Regarding education level, 68.3 % of the participants had a bachelor's degree, 24.7 % had a master's degree, and 7% had a doctorate degree. We recruited these highly educated participants through professional forums. We posted research-related announcements in the professional forums (Accountants, dentists, engineers, physicians, social workers, and teachers) through personal contact. The participants interested in the study contacted the researchers via email and received a link to the survey. The survey contains the informed consent form, demographic information, Turkish version of the questionnaires used in the current study. We declared that participation in this study was completely voluntary and they could withdraw from the study at any time.

Instruments

A personal information form was prepared to determine the participants' personal information such as gender, age, marital status, and education level.

The levels of procrastination among participants were assessed using the Pure Procrastination Scale (PPS) developed by Steel (2010). The PPS consists of 12 items and is rated on a five-point Likert-type scale ranging from 1 (Disagree) to 5 (Agree). An example item from the scale is "Even tasks that only require sitting down and doing them tend to remain undone for days." The psychometric properties of the PPS have been examined previously for a Turkish sample by Balkis and Duru (2019), who reported a high level of internal consistency ($\alpha=.92$). In the present study, the internal consistency coefficient for the self-doubt scale was $\alpha=.89$.

The levels of self-doubt among participants were measured using the Self-Doubt subscale of the Subjective Overachievement Scale (Oleson et al., 2000) in the present study. This eight-item scale is rated on a six-point Likert-type scale, ranging from 1 (*Disagree very much*) to 6 (*Agree very much*). An example item is "I sometimes find myself wondering if I have the ability to succeed at important activities." Duru and Balkis (2014) evaluated the psychometric properties of the Self-Doubt scale for a Turkish sample, reporting an acceptable level of internal consistency with a Cronbach's alpha of 0.78. For the current sample, Cronbach's alpha coefficient for the self-doubt scale was $\alpha = .86$.

The levels of irrational and rational beliefs among participants were measured using the Abbreviated Version of the Attitude and Belief Scale 2 (AV-ABS 2; Hyland et al., 2014). The AV-ABS 2 includes 24 items that assess both irrational and rational beliefs, measuring all four irrational belief processes (DEM, AWF, LFT, and GES) and four rational belief processes (PRE, N-AWF, HFT, and UA). Participants rated their agreement with each statement on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Duru and Balkis (2021) tested the psychometric properties of the AV-ABS 2 for the Turkish sample and reported acceptable internal consistency coefficients for the total irrational beliefs scale ($\alpha = .84$) and total rational beliefs scale ($\alpha = .85$). For the current sample, the Cronbach's alpha coefficients for the full irrational beliefs scale were $\alpha = .82$, and $\alpha = .83$ for the full rational beliefs scale.

The levels of fear of negative evaluation among participants were assessed using the Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). The BFNE consists of 12 items rated on a five-point Likert scale ranging from 1 (*Disagree*) to 5 (*Agree*). Çetin, Doğan, and Sapmaz (2010) evaluated the psychometric properties of the BFNE for Turkish samples and reported that confirmatory factor analyses confirmed a single factor structure of the BFNE with 11 items. A sample item is "When I am talking to someone, I worry about what they may be thinking about me."

Cronbach's alpha coefficients for the BFNE were $\alpha = .84$, and the test-retest reliability coefficient for the BFNE was .82 (Çetin et al., 2010). In the present sample, Cronbach's alpha coefficient for the BFNE was $\alpha = .92$.

Statistical Analyses

We analyzed data in four steps using SPSS 22.0 and Hayes's (2013) SPSS macro-PROCESS. In the first step, we conducted correlational analyses to test the link between self-doubt, fear of negative evaluation, irrational and rational beliefs, and procrastination. In the second step, we tested whether the fear of negative evaluation mediated the relations between self-doubt and procrastination by using Hayes's (2013) SPSS macro-PROCESS (Model 4). In the third and fourth steps, we tested whether the indirect predictive power of self-doubt on procrastination via fear of negative evaluation is dependent on a level of irrational (Model 7) and rational beliefs (Model 1) using Hayes's (2013) SPSS macro-PROCESS. Finally, we utilized a bootstrapped confidence interval (CI) to test whether the indirect effects of self-doubt on procrastination were significant via fear of negative evaluation at specific values of irrational and rational beliefs. We used R^2_{med} to assess mediating effect size (Fairchild et al., 2009). Finally, the variance inflation factor (VIF) and tolerance scores were examined to assess the independence of errors and multicollinearity (VIF scores < 5 and tolerance scores $> .20$ = acceptable; Hair et al., 2010).

Results

Preliminary Analyses

A post hoc power analysis was conducted using G*Power 3 (Faul et al., 2007) to estimate statistical power. The results showed that with a sample size of 344, the study had a statistical power of .85, .99, and 1.0 for detecting small, medium, and large effect sizes, respectively.

Next, we conducted correlational analyses to test whether procrastination is related to self-doubt, fear of negative evaluation, and irrational and rational beliefs. The findings indicated that procrastination was positively correlated with self-doubt, fear of negative evaluation, and irrational beliefs while it was negatively associated with rational beliefs. Self-doubt was positively related to fear of negative evaluation and irrational beliefs whereas it was negatively correlated with rational beliefs. Also, the fear of negative evaluation was positively associated with irrational beliefs and negatively related to rational beliefs. Finally, correlational analyses demonstrated that irrational beliefs were adversely related to rational beliefs (Table-1).

Table 1. Descriptive statistics, collinearity statistics, and correlational analysis (N = 344)

	1	2	3	4	5
1-Procrastination	-	.62**	.43**	.25**	-.31**
2-Self-Doubt		-	.56**	.34**	-.27**
3-Fear of Negative Evaluation			-	.49**	-.33**
4-Irrational Beliefs				-	-.25**
5-Rational Beliefs					-
Mean	27.24	19.38	29.45	34.74	46.95
Standard Deviation	9.71	6.60	9.37	7.47	6.77
Skewness	.760	.444	.330	-.001	-.395
Kurtosis	.433	-.261	-.228	-.402	.136
Tolerance		.675	.569	.743	.872
VIF		1.481	1.759	1.345	1.147

** $p < .001$

Mediation Model

We utilized Hayes's (2013) SPSS macro-PROCESS (model 4, Table 2, Figure 1) to test the mediation role of the fear of negative evaluation in the relationship between self-doubt and procrastination. The findings of the mediation analyses indicated that (a) self-doubt directly predicted the fear of negative evaluation ($B = .78, p < .001$) and procrastination ($B = .81, p < .001$), (b) the fear of negative evaluation directly predicted procrastination ($B = .13, p = .014$), and self-doubt indirectly predicted procrastination ($ab = .10, SE = .05, 95\%$ confidence interval $[CI] = .01, .20$) via fear of negative evaluation. The point estimate of R^2_{med} was .18 (95%CI = .11, .25), suggesting that the value of R^2_{med} was larger than 18 % of the variance in procrastination, which was attributable to the indirect predictive effect of self-doubt through the fear of negative evaluation. The point estimate of R^2_{med} was considered as a medium effect size. Further, the 95% confidence interval of R^2_{med} revealed that at least 11 % of the variance of procrastination was attributable to self-doubt mediated via the fear of negative evaluation, and up to 25.4 % of the variance in procrastination was explained by the mediating effect. These findings briefly indicated that the fear of negative evaluation partly mediated the relationship between self-doubt and procrastination, with an effect size from medium to large.

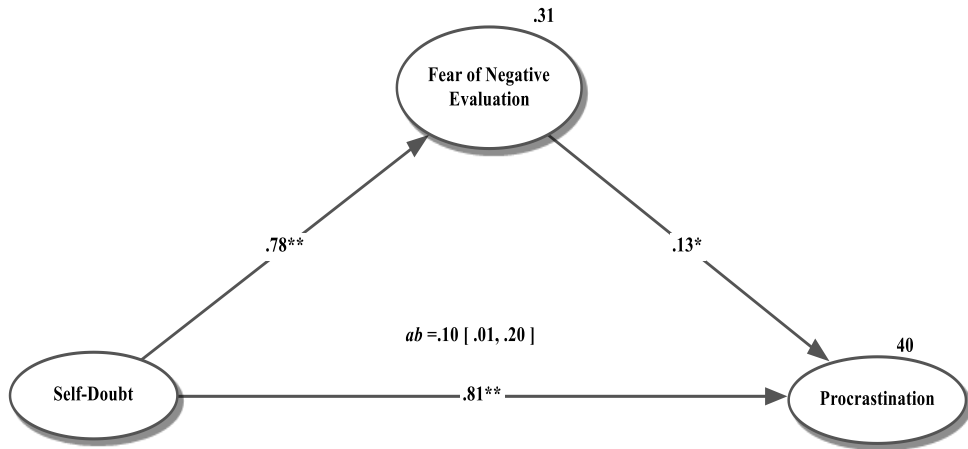


Figure 1. The mediating role of fear of negative evaluation

Table 2. Moderated mediation statistics ($N = 344$)

Outcome: Fear of Negative Evaluation (Model 4)					
Predictor variables	B	95 % CI	SE	t	Model R ²
Self-Doubt	.78	[.66 - .91]	.06	11.02***	.31***
Outcome: Procrastination					
Self-Doubt	.81	[.66 .95]	.07	10.99***	.40***
Fear of Negative Evaluation	.13	[.02 .23]	.05	2.46*	
Outcome: Fear of Negative Evaluation (Model 7 and Model 8)					
Self-Doubt	.59	[.47 .72]	.06	9.35***	.42***
Irrational Beliefs	.43	[.32 .54]	.06	7.79***	
Self-Doubt x Irrational Beliefs	.02	[.001 .03]	.01	2.05*	
Self-Doubt	.71	[.58 .84]	.06	10.96***	.35**
Rational Beliefs	-.27	[-.39 -.14]	.06	-4.21***	
Self-Doubt x Rational Beliefs	.001	[-.01 .02]	.01	.16 ^{ns}	
Conditional indirect effect analysis					
Outcome: Procrastination					
Irrational Beliefs	ab	Boot SE	BootLLCI	BootULCI	
Low	.06	.03	.01	.13	
Med	.08	.04	.01	.15	
High	.09	.04	.01	.18	

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

Moderated Mediation Model

We performed moderated mediation analysis to test whether self-doubt had an indirect effect on procrastination via fear of negative evaluation and this indirect effect was subject to moderation of irrational and rational beliefs. We tested the moderation role of irrational beliefs using Hayes' (2013) PROCESS macro (Model 7) as a single instance of moderated mediation.

Initially, we tested the moderation role of irrational beliefs as a single instance of moderated mediation using Hayes's (2013) PROCESS macro (Model 7). The findings of the moderated mediation analyses demonstrated that self-doubt ($B = .59, p < .001$), irrational beliefs ($B = .43, p < .001$), and the interaction of self-doubt and irrational beliefs ($B = .02, p = .041$) predicted the fear of negative evaluation. Additionally, procrastination was predicted by self-doubt ($B = .81, p < .001$) and the fear of negative evaluation ($B = .13, p = .014$). Also, we tested whether the indirect predictive effect of self-doubt on procrastination through fear of negative evaluation depended on irrational beliefs using the bootstrap procedure (5000). The results indicated that the indirect predictive effect of self-doubt on procrastination via fear of negative evaluation was more powerful when the level of irrational beliefs was higher ($ab = .09, SE = .04, 95\% \text{ of } CI = .01, .19$) rather than medium ($ab = .08, SE = .04, 95\% \text{ of } CI = .01, .15$) or low ($ab = .06, SE = .03, 95\% \text{ of } CI = .01, .13$). These results support the claim that irrational beliefs play a vulnerability factor in the relationship between self-doubt and procrastination (Table-3).

Table 3. Moderation statistics ($N = 344$)

		<i>Outcome: Procrastination (Model 1)</i>			
Self-Doubt	.83	[.70 .95]	.06	13.09***	.42***
Rational Beliefs	-.20	[-.33 -.08]	.06	-3.32**	
Self-Doubt x Rational Beliefs	-.02	[-.03 -.003]	.01	-2.41*	
<i>Conditional direct effect analysis</i>		<i>Outcome: Procrastination</i>			
Rational Beliefs	<i>b</i>	<i>Boot SE</i>	<i>BootLLCI</i>	<i>BootULCI</i>	
Low	.95	.07	.80	1.09	
Med	.83	.06	.70	.95	
High	.71	.09	.54	.88	

* $p < .05$, ** $p < .01$, *** $p < .001$

Next, we tested the moderation role of rational beliefs as a single instance of moderated mediation using Hayes's (2013) PROCESS macro (Model 7 and 8, Table 2). The findings of the moderated mediation analyses showed that the indirect predictive power of self-doubt on procrastination via fear of negative evaluation did not differ across the level of rational beliefs. Then, we conducted moderation analyses using Hayes's (2013) PROCESS macro (Model 1) to examine whether the rational beliefs acted as a moderator variable in the relationship between self-doubt and procrastination. The findings of the moderation analysis indicated that procrastination was predicted by self-doubt ($B = .83, p < .001$), rational belief ($B = -.20, p = .001$), and the interaction of self-doubt and rational beliefs ($B = -.02, SE = .01, \Delta R^2 = .01, p = .016$). In addition, simple slope analysis demonstrated that the association between self-doubt and procrastination was stronger when the level of rational belief was at a low level ($b = .95, p < .001$) rather than a medium level ($b = .83, p < .001$) or a high level ($b = .71, p < .001$). These findings suggest that the direct

predictive effect of self-doubt on procrastination increases or decreases depending on the level of rational belief (Table 3, Figure 2).

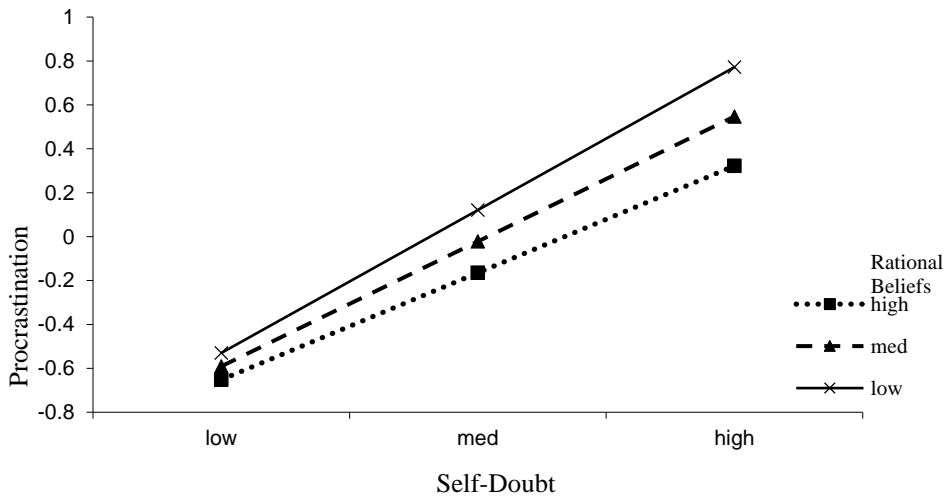


Figure 2. The moderating role of rational beliefs

Discussion

We conducted a cross-sectional study to ascertain the mechanisms underlying the relationship between self-doubt and procrastination. The present findings revealed that the fear of negative evaluation might have a mediating function in the relationship between self-doubt and procrastination. Also, the moderated mediation model revealed that the indirect predictive effect of self-doubt on procrastination via fear of negative evaluation varied depending on different irrational/rational belief levels.

Regarding the first hypothesis, mediation analysis indicates that self-doubt has a significant direct effect on procrastination, but this effect is partially mediated by fear of negative evaluation. Specifically, higher levels of self-doubt are associated with more procrastination, and this relationship is partially explained by increased fear of negative evaluation. The current finding suggested that the fear of negative evaluation was a crucial factor that mediated the relationship between self-doubt and procrastination. In this sense, the present findings support previous evidence in that procrastination is associated with self-doubt (Duru & Balkis, 2014; Balkis & Duru, 2018, 2019) and the fear of negative evaluation (Bui, 2007; Sadler & Buley, 1999). In addition, Senecal, Lavoie, and Koestner (1997) stated that the expectation of being

evaluated on a task, compared to not expecting to be evaluated on a task, was more likely to delay starting or completing the task. In this vein, Burka and Yuen (2008) suggested that people with a high level of procrastination tended to be afraid of being judged according to their performance. They believe their self-worth will suffer if they do not complete their tasks satisfactorily. The current findings suggested that self-doubt affected the fear of negative evaluation and in turn, the fear of negative evaluation influenced procrastination. In other words, if an individual has doubts about his or her competence in completing a task, this may activate the fear of negative evaluation and increased fear of negative evaluation may contribute to delaying the current task.

Consistent with the second hypothesis, the findings of the moderated mediation indicated that the strength of the indirect effect of self-doubt on procrastination, via fear of negative evaluation, varies depending on the level of irrational beliefs. Specifically, when individuals have higher levels of irrational beliefs, the indirect effect of self-doubt on procrastination through fear of negative evaluation is stronger, suggesting that irrational beliefs may amplify the negative impact of self-doubt on procrastination through fear of negative evaluation. The study suggests that individuals who doubt their ability to successfully complete a task may experience increased fear of negative evaluation, leading to a greater likelihood of procrastination. This is especially true when the individual perceives the situation as catastrophic, intolerable, and an indicator of their self-worth. These findings are consistent with previous research linking procrastination to irrational beliefs (Balkis & Duru, 2018, 2019; Steel, 2007), self-doubt, and fear of failure (Balkis & Duru, 2018, 2019). Specifically, irrational beliefs were found to moderate the direct effect of self-doubt on fear of failure, as well as the indirect effect of self-doubt on procrastination through fear of failure (Balkis & Duru, 2019). These findings support the Rational Emotive Behavior Therapy (REBT) theory, which suggests that irrational beliefs serve as vulnerability factors that contribute to maladaptive emotions (such as fear of negative evaluation) and behaviors (such as procrastination).

Finally, the moderated mediation model indicated that the strength of the direct effect of self-doubt on procrastination varies depending on the level of rational belief. When individuals have higher levels of rational belief, the direct effect of self-doubt on procrastination weakens, suggesting that rational belief may serve as a protective variable in the relationship between self-doubt and procrastination. In other words, when an individual experiences self-doubt about their ability to complete a task successfully, it is less likely that they will postpone starting or completing the task if they (a) realistically evaluate the situation, (b) perceive it as tolerable, and (c) still maintain a sense of self-worth and self-love. These findings provide further support for the Rational Emotive Behavior Therapy (REBT) theory, which suggests that rational beliefs function as cognitive resilience factors and lead to adaptive behaviors (Davitt et al., 2010). The study also aligns with recent research

that indicates rational beliefs are negatively associated with self-doubt and procrastination (Balkis & Duru, 2018, 2019). In essence, the study suggests that having rational beliefs can increase an individual's resilience and enable them to engage in adaptive behaviors, such as being less likely to delay, in the face of a stressful situation, such as self-doubt.

Conclusion

To sum up, this study highlights two mechanisms that elucidate the link between self-doubt and procrastination among well-educated adults. Firstly, consistent with Ferrari et al.'s (1995) proposal that the fear of failure mediates the link between self-doubt and procrastination, the present findings suggest that self-doubt leads to a fear of negative evaluation, which predicts procrastination. Secondly, the study supports REBT's assumptions regarding the roles of rational and irrational beliefs. According to REBT, irrational beliefs act as cognitive vulnerability factors that result in maladaptive emotions and behaviors, while rational beliefs serve as cognitive protective factors that promote adaptive behaviors. In this context, the predictive effect of self-doubt on the fear of negative evaluation and the indirect effect of self-doubt on procrastination via the fear of negative evaluation increase when levels of irrational beliefs are high, whereas high levels of rational beliefs serve as a protective factor against the predictive effect of self-doubt on procrastination.

Theoretical and Practical Implication

All in all, this study adds to the existing literature on procrastination by shedding light on how and when self-doubt affects procrastination in adult individuals. The study contributes to the literature by highlighting the mediating role of the fear of negative evaluation in the relationship between self-doubt and procrastination. The findings also support the REBT framework by demonstrating the protective role of rational beliefs against procrastination and the negative effects of self-doubt. This study provides a better understanding of the underlying mechanisms of procrastination, which can inform future research on this topic.

In terms of practical implications, the findings suggest that self-doubt influences procrastination through the fear of negative evaluation, especially when levels of irrational beliefs are high. Additionally, the study suggests that the direct effect of self-doubt on procrastination may be weakened when levels of rational beliefs are high. Therefore, interventions aimed at reducing procrastination should focus on addressing self-doubt and irrational beliefs. Helping individuals to develop more rational and adaptive beliefs may lead to a decrease in procrastination behaviors. Thus, clinicians should focus on challenging evaluative irrational beliefs and encouraging rational beliefs to cope with procrastination stemming from self-

doubt. Through this process, they can teach their clients to evaluate self-efficacy, tolerance, and acceptance logically.

The present study has several limitations that should be taken into consideration. Firstly, the use of a cross-sectional design precludes the establishment of causal relationships between the variables. Future longitudinal studies are recommended to gain a deeper understanding of the contributions of fear of negative evaluation, irrational/rational beliefs, and self-doubt to the development of procrastination. Additionally, the measurements employed in this study, namely self-report questionnaires, are susceptible to biases such as social desirability or recall bias. These limitations could have influenced the reported associations among the variables. To address this, validated scales were utilized, and measures were taken to ensure confidentiality and anonymity, fostering more candid responses. Nevertheless, caution is advised when interpreting the results.

Secondly, the study sample exhibited limited diversity, with only 34.6% male participants and a high level of education, potentially restricting the generalizability of the findings. Therefore, it is important for future research to replicate these findings with samples encompassing varying education levels to enhance the generalizability of the results. Moreover, considering the specific characteristics of the sample, it is crucial to recognize that different populations may manifest differing levels of self-doubt, fear of negative evaluation, and irrational beliefs. Replication studies involving diverse samples are warranted to enhance the external validity of the findings. Finally, given the cross-sectional nature of our study, it is imperative to acknowledge the possibility of reverse causality as a plausible explanation for the observed relationships. Although we have investigated the associations among self-doubt, fear of negative evaluation, rational and irrational beliefs, and procrastination, it is conceivable that alternative explanations or feedback loops may exist. Hence, conducting further longitudinal or experimental research could aid in disentangling the direction of causality and providing a more comprehensive understanding of these relationships.

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