

The effects of medical students' self-oriented perfectionism on academic procrastination: the mediating effect of fear of failure

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Purpose: Based on the logic that self-oriented perfectionism (SOP) is one of the most well-established predictors of academic procrastination (AP), we predicted that fear of failure (FF) would mediate the association between SOP and AP. The purpose of this study is to investigate the mediating effect of FF on the influence of SOP on AP in medical students.

Methods: A total of 156 undergraduate medical students completed a battery of questionnaires. This study is an analysis of cross-sectional data obtained through an offline survey. The self-report questionnaires assessed demographics and psychological scales, including the Multidimensional Perfectionism Scale, Performance Failure Appraisal Inventory, and Aitken Procrastination Inventory. The data were analyzed by descriptive statistics, correlations analysis, and multiple regression analyses using IBM SPSS ver. 22.0 (IBM Corp., Armonk, USA).

Results: SOP had a direct negative influence on AP ($\beta = -0.420$, $p < 0.001$). Also, SOP had a significant indirect effect on AP through FF ($\beta = 0.0393$; 95% confidence interval, 0.040–0.0936). These results indicated that the FF partially mediates the relationship between SOP and AP.

Conclusion: Although SOP among medical students might play an adaptive role to lessen AP, in cases FF gets higher, SOP could have opposing effects via the mediating effect of FF, leading to an actual increase in AP. Attempts to deal with the FF among medical students should be made for better academic achievements.

Key Words: Self-oriented perfectionism, Academic procrastination, Fear of failure, Medical students

Introduction

Procrastination has recently become a common phenomenon worldwide [1] and poses a significant problem in self-regulation failure consequences, especially in academia [2]. Academic procrastination (AP) is a common behavioral tendency to unnecessarily delay starting or

finishing required academic tasks with a fixed deadline, despite knowing that such delay will result in negative consequences [2–4].

Studies have revealed that 70% of students procrastinate at some point [3], and 50% procrastinate consistently and problematically [5], approximately 20% of adults procrastinate in general in their everyday lives [6]. Therefore, procrastination seems to cause more problems for students

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than for the general adult population [7]. Meanwhile, a study looking at the relationship between academic achievement and procrastination of medical school students by Hayat et al. [1] has reported that 29.25% of medical students said they always or almost always delayed their academic tasks. This result is higher than the 10% of college students' procrastination rate in previous studies [7].

The current culture in medical schools often demands that medical students be faultless and flawless. Characteristics, such as impeccable performance, high competency in the medical field, and awareness of detail, are generally expected of medical students and physicians. Therefore, medical students may set too perfect standards for academic tasks and it may be difficult to complete tasks that meet high standards, which puts pressure on themselves. AP tends to occur frequently when the absolute amount of academic tasks increases, and the task becomes more complex and stressful [5,7].

Procrastination brings about high levels of stress, withdrawal of assignments, and prematurely ending tasks due to the lack of time. As we can see, procrastination itself can affect the outcome of achievement or performance. Moreover, we should not overlook the subjective psychological discomfort as well as the negative consequences that accompany procrastination [7]. Contributing factors to AP, include perfectionism [3,5,8], stress, and fear of failure (FF) [7]. In particular, people with overwhelming perfectionistic tendencies tend to avoid situations where they need to meet unrealistically high standards. As such, certain aspects of perfectionism may play a central role in the maintenance of AP [2].

Perfectionism is defined as having excessively high standards of performance and a self-critical tendency accompanied by pursuing flawlessness [3]. Over the decades, many previous studies have found significant correlations between perfectionism and AP [2,3,6,8], and

the relationship with AP is either negative or positive depending on the dimension of perfectionism. A meta-analysis by Sirois et al. [2] denoted that perfectionistic concerns have a positive association with procrastination, whereas perfectionistic strivings have a negative association with procrastination.

Hewitt and Flett [9] developed the Multidimensional Perfectionism Scale (HFMP), which identified three components of perfectionism: self-oriented, other-oriented, and socially prescribed perfectionism (SPP) [9]. Self-oriented perfectionism (SOP) refers to pursuing unrealistic high standards for oneself, namely perfectionistic striving for self. Other-oriented perfectionism (OOP) involves similar behaviors, but these behaviors are directed toward others instead of the self. SPP entails the belief that others have perfectionistic expectations and motives for themselves [9]. This classification of perfectionism is not based on perfectionistic behavior but rather on the motivations for the behavior.

Through many studies, SOP is considered an adaptive and positive construct because it has motivational aspects that actively strive to meet high standards for self [9,10]. SOP has been previously shown to correlate negatively with AP [4,9]. Interestingly, medical students have high scores in SOP than other college students [9], but low scores in SPP [11,12]. According to the study by Yu et al. [13], researchers focused on the relationship between SPP and academic burnout. However, this study needs to focus on SOP in medical students, based on the results of previous studies that medical students showed a high level of SOP. Especially, given that medical students' sheer amount of learning and academic tasks may lead to procrastination, it is necessary to understand the effect of SOP on AP among medical students.

Meanwhile, FF is conceptualized as an avoidance motivation when individuals predict the aversive consequences of failing [14]. FF had a significant re-

relationship with perfectionism in previous studies [8,15,16]. Flett et al. [8] found that the FF was significantly associated with all dimensions of perfectionism. According to Hill et al. [15], SOP was positively related to FF and concern over mistakes. In a study by Conroy et al. [16], when SOP and OOP were simultaneously elevated, they contributed positively to fears of experiencing shame and embarrassment. In addition, FF has been shown to have a significant association with AP and is considered to be a key component in procrastination [8].

With these findings, we hypothesized that while individuals with a high level of SOP are less likely to procrastinate, SOP would no longer be an adaptive role when achievement-related stress or the fear of academic failure is excessively high. In other words, under high levels of academic stress or fear of academic failure, self-oriented perfectionists might engage in procrastinating behaviors to avoid failures. Therefore, an examination is needed focusing on the relationship between SOP and AP in medical students who were exposed to excessive academic loads in a highly competitive academic environment.

1. Summary of the research question

This study aimed to investigate the mediating effect of FF in the relationship between SOP and AP in medical students. Based on the logic that SOP has a negative association with AP, we predicted that FF would affect the relationship between SOP and AP. Our primary research question is: Does SOP have a significant indirect effect on AP through its influence on FF in medical students?

Hypothesis 1.1 SOP has significant associations with AP.

Hypothesis 1.2 SOP has significant associations with FF.

Hypothesis 1.3 FF mediates the association between SOP and AP. SOP has a significant indirect association with AP via FF in medical students.

Methods

1. Participants

This study was conducted at an undergraduate medical school in Seoul, Korea. Among a total of 244 students in medical school, the questionnaires were provided to 163 students (129 males and 34 females) in the medical course who had a similarly high academic burden, except for 81 in the premedical course. Among the 163 eligible for inclusion, 156 (95.7%) responded: 40 in first-year students, 40 in second-year, 40 in third-year, and 36 in fourth-year. Respondents had a mean age of 22.5 years and 28 females (18.1%).

2. Measures

Students responded to a questionnaire that included demographic items and the following three scales.

1) SOP

To measure perfectionism, we included the Korean version Multidimensional Perfectionism Scale (HFMPs) developed by Hewitt and Flett [9]. The Korean HFMPs was well translated by Han [17] and shown to have validity evidence with South Korean college students by Seo [4] and Yu et al. [13]. The HFMPs measures the following three dimensions of perfectionism: SOP, SPP, and OOP. The scale consists of a total of 45 items (15 items for each dimension) measured with a 7-point Likert-type scale from strongly disagree (1) to strongly agree (7), with higher scores reflecting higher levels of perfectionism. Participants answered statements such as "My goal is to be perfect in everything," and "I try to be perfect as possible," which are indicative of SOP. For the present study, we surveyed a full scale of HFMPs, we only used the SOP subscale.

2) FF

To measure FF, we used the Korean version of the Performance Failure Appraisal Inventory by Conroy et al. [18], which was translated by Lim [19]. For the translation of the scale appropriately, it went through a translation, and reverse translation process, and it was double-checked by a bilingual psychologist. This scale consists of 25-items, which measures five lower-order fears of failing: fears of experiencing shame and embarrassment (seven items), fears of devaluing one's self-estimate (four items), fears of having an uncertain future (four items), fears of important others losing interest (five items), and fears of upsetting important others (five items). Participants answered on a 5-point Likert-type scale, from "not at all" (1) to "very much" (5), with statements regarding failing, such as "When I am failing, I am afraid that I might not have enough talent." We used scores by a sum in a total of all 19 items. Higher scores reflect higher levels of fear about failing.

3) AP

To measure the AP of medical students, we used the Korean version of the Aitken Procrastination Inventory (API) developed by Aitken [20] and translated by Park [21]. The translation process was valid and well-done, and its validity was verified in many further studies [4]. The API is a self-report instrument used for measuring trait procrastination among college students. It consists of 19 items, with a 5-point Likert-type scale ranging from 1 (false) to 5 (true). We used scores by a sum in a total of all 19 items. Higher scores reflect higher levels of chronic procrastination among students. Participants answered statements such as "I delay starting things for so long that I don't get them done by the deadline."

3. Procedure

The questionnaire was conducted between February and March 2019. This study was approved by the Institutional

Review Board at Asan Medical Center (approval no., 2018-1422) and conducted in compliance with all ethical research standards. The protection of any personal information provided by sample group participation was agreed upon. The data collection was conducted for each grade by a research assistant who was not aware of the researcher's hypothesis to minimize the possibility of demand characteristics. After explaining the survey's purpose to students, the research assistant distributed a battery of questionnaires and a written informed consent. The students willing to participate signed the consent form and completed a questionnaire. The whole procedure lasted 30 minutes. Participation was voluntary, and anonymity and confidentiality of participants were maintained.

4. Data analysis

Based on the survey data, a correlation analysis was conducted to identify the relationships between variables using IBM SPSS ver. 22.0 (IBM Corp., Armonk, USA). Correlation analysis was initially performed to identify subscales. As established by Baron and Kenny [22], a multiple regression analysis was undertaken to evaluate if FF could mediate the relationship between SOP and AP. In multiple regression analysis, multicollinearity can be detected via the variable inflation factors (VIF). A VIF value under 5 in this study, which identifies variables, is not affected by multicollinearity.

Finally, to test the significance of the mediation effect, we used the bootstrap approach recommended by Shrout and Bolger [23]. We created 1,000 bootstrap data samples from the original data set (N=156). If the 95% confidence interval (CI) for the estimate of an indirect effect does not include zero, it can be concluded that the indirect effect is statistically significant at the 0.05 level [24].

Results

1. Descriptive and correlation analyses

Of the total 156 respondents, the female students were 28 (18.1%), and the mean age was 22.5 years. Table 1 displays the mean, standard deviation, Cronbach's α , and correlation coefficients between variables. The mean SOP, FF, and AP scores were 62.81 ± 14.33 , 69.80 ± 16.91 , and 52.67 ± 10.25 , respectively. Cronbach's α ranged from 0.84 to 0.94, showing good to excellent reliability. SOP was negatively correlated ($r = -0.37$, $p < 0.001$) with AP, while positively correlated with FF ($r = 0.17$, $p < 0.05$). In addition, there was a positive correlation ($r = 0.21$, $p < 0.01$) between FF and AP.

2. Effect of SOP and FF on AP

The total effect (the predicted strength of the simple regression analysis) of SOP on AP was significant ($\beta = -0.366$, $p < 0.001$). The results are shown in Table 2. And

then multiple regression analysis was performed to evaluate the effect of SOP and FF on AP. SOP and FF could explain 22.1% ($F = 20.887$, $p < 0.001$) of AP. Both SOP ($\beta = -0.420$, $p < 0.001$) and FF ($\beta = 0.301$, $p < 0.001$) could significantly predict AP.

3. Mediating effect of FF on the relationship between SOP and AP

Finally, to test whether the FF mediated the relationship between SOP and AP, we conducted mediation analyses using multiple regression analysis. We used the three steps established by Baron and Kenny [22] and the bootstrapping test of mediation [25]. The results are shown in Fig. 1.

SOP had a direct negative influence on AP ($\beta = -0.420$, $p < 0.001$). SOP significantly predicted FF ($\beta = 0.17$, $p < 0.05$), and the FF significantly predicted AP ($\beta = 0.30$, $p < 0.001$). These results indicated the FF partially mediates the relationship between SOP and AP. The indirect effect of SOP through a FF on AP was significant ($\beta = 0.0393$, $p < 0.001$). Finally, a bootstrapping test confirmed that FF

Table 1. Mean, SD, Cronbach's α , and Correlations among Variables (N=156)

	Mean \pm SD	Cronbach's α	Correlation coefficient		
			SOP	FF	AP
SOP	62.81 \pm 14.33	0.91	1		
FF	69.80 \pm 16.91	0.94	0.17*	1	
AP	52.67 \pm 10.25	0.84	-0.37***	0.21**	1

The Cronbach α of full-scale HFMPs, SPP, and OOP was 0.89, 0.83, and 0.77, respectively.

SD: Standard deviation, SOP: Self-oriented perfectionism, FF: Fear of failure, AP: Academic procrastination.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

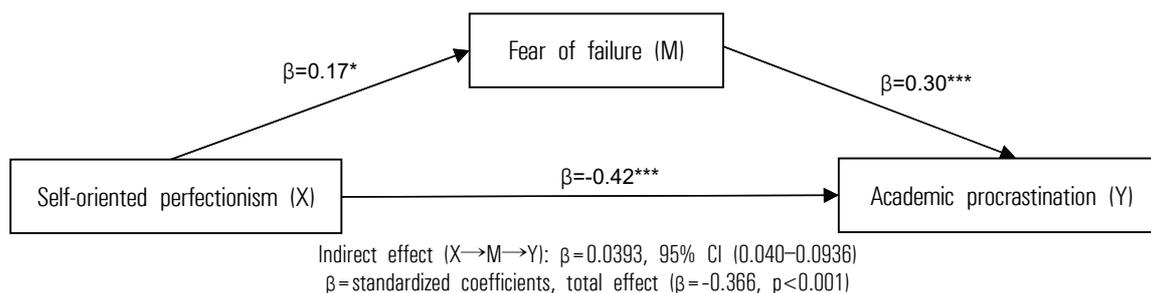
Table 2. Multiple Regression Analysis of Self-oriented Perfectionism and Fear of failure on Academic Procrastination (N=156)

Dependent variable	Independent variable	Unstandardized coefficients		Standardized coefficients	t-value	R ²	Adjusted R ²	F-value
		B	SE	β				
Academic procrastination	Self-oriented perfectionism	-0.263***	0.055	-0.366***	-4.779	0.134	0.128	22.842***
Fear of failure	Self-oriented perfectionism	0.200*	0.095	0.169*	2.091	0.029	0.022	4.374*
Academic procrastination	Self-oriented perfectionism	-0.302***	0.053	-0.420***	-5.678	0.221	0.211	20.887***
	Fear of failure	0.184***	0.045	0.301***	4.066			

SE: Standard error.

* $p < 0.05$. *** $p < 0.001$.

Fig. 1. Fear of Failure Mediating the Relationship between Self-oriented Perfectionism and Academic Procrastination



CI: Confidence interval. * $p<0.05$. *** $p<0.001$.

partially mediated the relationship between SOP and AP (95% CI, 0.040-0.0936).

Discussion

We found a significant association among SOP, FF, and AP variables in line with our hypotheses. As expected, SOP among medical students showed a negative direct effect on AP, consistent with previous studies. However, notably, SOP had a statistically significant indirect negative association with AP, in which FF played a significant role. To our knowledge, this is the first study to examine an indirect association mediated by FF between SOP and AP in medical students.

As noted above, the negative association between SOP and AP indicated an inverse relationship between perfectionistic striving and academic procrastinating behavior. In other words, a high level of SOP may lead to less likely AP. In other words, SOP can be a protective factor for AP. Especially, medical students who are well-organized and strive to achieve high personal standards are less likely to procrastinate when preparing for exams, writing papers, and completing reading assignments. These findings are consistent with multiple other studies that verified the relationship between SOP among college students and AP [2,4,6].

Both SOP and FF significantly predict AP among

medical students. There was a negative direct effect of SOP on AP; however, there was a positive indirect effect between SOP and AP mediated by FF. The findings of our study suggest that SOP has self-regulation functioning. In other words, those who have higher tendencies of SOP may have more optimistic views of their ability to achieve high self-standards, may regulate themselves to continue their effort, and thus greater chance to succeed in achieving their goal.

Interestingly, the present research is the first study that we are aware of to demonstrate both a positive indirect association between SOP and AP via FF as well as a negative direct association between SOP and AP. In general, it is expected that the direction of the direct effect and indirect effect will be the same in the mediating model. However, from the results of this study, a direct effect was negative ($\beta=-0.420$) and an indirect effect was positive ($\beta=0.0393$). Moreover, the size of the direct effect is greater than the size of the total effect ($\beta=-0.366$). That is, if the size of the direct effect (the predicted strength of the multiple regression analysis) becomes larger than the size of the total effect (the predicted strength of the simple regression analysis), it can be explained as an inconsistent mediating model in which the inhibitory effect (FF) occurred [26]. Therefore, one potential explanation for our findings is that a higher perfectionistic striving tendency may lead to a higher tendency of FF under certain circumstances, which predict more likely

AP. It means that a higher tendency toward FF yields more procrastination on academic tasks in medical students. The positive association between SOP and FF was reported in past studies that verified the link between college students' SOP and FF [15]. Also, FF is known to be a key component of procrastination [8]. Therefore, evidence suggests that higher SOP and higher FF can lead to more likely AP.

In a past study that compared perfectionism between medical students and other students, medical students showed higher personal standards and lower maladaptive perfectionism scores [10]. It suggested that the selection process for medical school entry may reduce the likelihood that students with high levels of maladaptive perfectionism are admitted [10]. However, because of the overly competitive medical school's academic atmosphere, excessive academic loading, and academic stress, medical students often experience anxiety and stress over academic failures and may not deal with academic failures properly. As a result, academic self-efficacy can reduce, and self-doubt can increase, leading to avoidance or procrastination of certain academic situations with predicted failure. Indeed, in a past study, medical students showed a significant longitudinal decrease in SOP associated with intrinsic motivation or deep learning strategies [27].

Our findings have some practical implications. Medical students have a high tendency of SOP, which results in high academic achievements due to its adaptive aspect, but in students with FF, it may lead to AP. Under high levels of fear of academic failure, self-oriented perfectionists often engage in procrastinating behaviors to avoid mistakes or failures. Therefore, efforts are needed to carefully monitor and deal with the FF and AP for medical students. For the students who have difficulties in their studies due to AP, academic coaching could be considered to help them set appropriate goals and proceed with their studies [28]. Students might also benefit from counseling services that focus on appropriately dealing with the FF.

Well-known interventions for reducing AP emphasize enhancing self-monitoring skills, self-reward, and behavioral skills such as time management. Utilizing a peer mentoring program to help academic difficulties [29] or applying self-evaluation methods of informal and hidden curriculum might also be considered an institutional-level intervention to reduce students' FF. Moreover, to deal with the FF, it would be effective to teach skills, such as the "mindfulness-based stress reduction" program, to reduce anxiety and fear related to high-stakes evaluations, tests, and academic tasks [30]. Enhancing resilience [31] and self-efficacy [13] through the appropriate application of learning strategies and social support can also prevent medical students from avoiding and procrastinating in predicted fearful situations.

This study has several limitations. First, we included a population of medical students in a single, small-sized medical school in Korea, which may limit the generalizability of the results to the whole medical students. However, this study's response rate was approximately 96%; therefore, it could be regarded as representative data of one medical school. Second, the gender distribution was disproportionate in this study. Given the small percentage of female students in the total number of students, female participation is not significantly low. Further studies are needed to replicate our findings in a larger population. Also, a longitudinal study design and diversified measurement methods, including in-depth interviews with focus groups, would be desirable.

In conclusion, this study identified a significant association among SOP, FF, and AP in medical students. SOP had a direct negative effect on AP among medical students. However, SOP had a significant positive indirect effect on AP via the FF. When self-oriented perfectionists find themselves in highly challenging and competitive situations, they could experience FF, leading to procrastination of academic tasks. In other words, self-

oriented perfectionists could more likely procrastinate academically when FF is accompanied among medical students. Therefore, medical educators need to find a way to deal with the fear of academic failure. Findings from our work inform the development of educational strategies and interventions to assist medical students in better managing the fear of academic failure and the pressures of perfectionistic striving tendencies.

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