



Impact of college students' academic procrastination on subjective well-being

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We used mindfulness as a mediating variable and self-efficacy as a moderator to examine the relationship between academic procrastination and subjective well-being. Participants comprised 512 college students from Hangzhou, Xiamen, and Huizhou in China. Results show that academic procrastination had a negative impact on subjective well-being, and that mindfulness was a mediator in this relationship. In addition, self-efficacy played a moderating role in the academic procrastination–mindfulness relationship, and, to a certain extent, regulated the relationship between academic procrastination and subjective well-being. Thus, the stronger the self-efficacy of college students, the weaker was the negative predictive effect of academic procrastination on mindfulness. The significance of mindfulness and self-efficacy regarding subjective well-being among procrastinators is discussed.

Keywords

academic procrastination;
subjective well-being;
mindfulness; self-efficacy;
self-regulation

Positive psychology has received greater interest than has psychopathology in recent research (Seligman & Csikszentmihalyi, 2000). A central concept of positive psychology is *subjective well-being* (SWB), which describes an overall assessment of an individual's quality of life according to self-determined criteria (Diener, 1984). SWB comprises two dimensions: cognitive (e.g., life satisfaction) and emotional (positive and negative). Many factors affect SWB, including social, familial, and psychological factors; demographic variables; and individual behavior. Among college students, academic procrastination is an essential factor in determining SWB as it contributes to high stress and sleep deprivation, which negatively affect SWB (Kandemir, 2014). In contrast, mindfulness is considered to reduce stress, enhance task persistence, and improve health; thus, it has been found to be positively associated with SWB (Sirois & Tosti, 2012). Self-efficacy, which is said to increase stress coping and improve self-esteem and physical condition, has also been positively linked to SWB (Karademas, 2006). There is a gap in the literature regarding the relationship of these variables; thus, we investigated the mechanisms by which academic procrastination affects SWB, and examined the roles of mindfulness and self-efficacy as a mediator and a moderator, respectively, in this process.

Literature Review and Hypothesis Development

Academic Procrastination and Subjective Well-Being

Academic procrastination (AP), which involves purposefully delaying learning tasks that must be completed (Schraw et al., 2007), is common among college students. It is estimated that 80–95% of college

students exhibit procrastination habits (Ellis & Knaus, 1977; O'Brien, 2002). AP leads to behavioral outcomes such as a lower sense of task responsibility, feelings of lack of control in learning activities, reduced possibility of success, and a negative impact on physical and mental health (Çıkrıkçı & Erzen, 2020; Hen & Goroshit, 2020; Tice & Baumeister, 1997). There are also emotional effects, such as pressure, regret, self-blame, shame, panic, and burnout (Ocal, 2016; Sirois, 2016). SWB is an important emotional outcome related to AP, which can lead to the negative emotions of guilt, regret, anxiety, and despair; thus, AP can have a negative effect on SWB (van Eerde, 2003; Zeenath & Orcullo, 2012). Frequent procrastination among college students contributes to a decline in learning efficiency and academic performance, high recurrence of negative emotions, and continuous deterioration of learning engagement. All of these factors affect college students' physical and mental health, thus weakening their SWB (Berber Çelik & Odaci, 2020; Stead et al., 2010). However, college students who consider the learning task to be enjoyable and able to be completed on time have high SWB high (Little, 1989). Thus, we proposed the following hypothesis:

Hypothesis 1: Academic procrastination will be negatively related to subjective well-being.

Mediating Role of Mindfulness

AP is a typical self-regulation (SR) failure (Steel, 2007). Using social cognitive theory, Bandura (1986) defined *self-regulation* as the process of self-generation of thoughts, emotion, and behavior to set and achieve individual goals. Procrastinators find it difficult to achieve their goals on time as their self-regulatory system is either misregulated (i.e., taking ineffective action; Sirois & Pychyl, 2013) or underregulated (i.e., failing to take action; Balkis & Duru, 2016). Long-term procrastinators, who are under high cognitive load, objective self-consciousness, and time constraints, may display SR failure in terms of speed and accuracy (Ferrari, 2001). Yang et al. (2019) found in an examination of Chinese college students' use of smartphones that academic procrastinators had weaker self-regulation; therefore, their smartphone use tended to become problematic. M. Wang et al. (2011) also found in their group counseling intervention research, which was focused on improving SR learning efficacy, that students' AP decreased as their SR function increased.

Procrastinators' SR of motivation may fail. Self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) holds that procrastination is closely related to behavioral motivation, namely, the greater the degree of self-determination of motivation, the lower is the procrastination (Li, 2011). Grunschel et al. (2016) found in their study on self-regulated learning that motivation regulation strategies were negatively correlated with procrastination.

The SR of procrastinators' emotion may also fail. Self-management theory (Gollwitzer et al., 2004) holds that procrastination is the result of poor self-management in individuals' SR. Such individuals may be ineffective at managing their behavior and emotion, leading to delay, because of improper goal setting or deviation from their plans (Dewitte & Schouwenburg, 2002). Procrastination is a way for them to temporarily escape from anxiety (Solomon & Rothblum, 1984), and may initially improve their mood (Sirois, 2004; Tice et al., 2001). However, their mood may later worsen, leading to a spiral of depression (Lindsley et al., 1995). Thus, procrastination may lead to an emotional SR disorder. As motivational regulation (Grunschel et al., 2016) and emotional regulation (Weytens et al., 2014) are both closely associated with SWB, procrastination may negatively affect SWB through the mediating role of SR of motivation and emotion.

Mindfulness, which is drawn from Buddhism, in which it is one of the eight righteous ways, can be used to relieve suffering and realize self-awakening. Kabat-Zinn's (1982) introduction of this concept into health psychology brought revolutionary changes to traditional practices (Keng et al., 2011). Mindfulness is a present-centered, nonreactive self-awareness and a nonjudgmental acceptance of thoughts and feelings as they occur (Baer et al., 2004). It can be understood as high-quality consciousness (Rigby et al., 2014). Researchers consider mindfulness to be a state-like trait (W. Duan, 2014), the trait-like function of which enables it to be stably measured. We used the Mindful Attention Awareness Scale (MAAS; Brown & Ryan,

2003) to assess mindfulness as a trait that can be used in daily life. The scale is also suitable for individuals with no affiliation to Buddhism or background in meditation, such as college students (Brown & Ryan, 2003).

Functions of mindfulness are relevant to SR, for example, the function of SR of motivation. A core characteristic of mindfulness is open or receptive awareness and attention (Martin, 1997). According to self-determination theory, open awareness is particularly valuable for the promotion of behavioral choices that meet individual needs, values, and interests (Deci & Ryan, 1980). The higher is individuals' trait mindfulness, the more likely they are to act autonomously and voluntarily (Brown & Ryan, 2003). As high autonomy produces strong motivation (Li, 2011), it appears that mindfulness can improve motivation.

In addition, mindfulness has the function of SR of emotion. Kabat-Zinn (2003) showed that if mindfulness is applied to experiences, each stimulus arousal can be detected. When individuals view their experiences in a noncritical and nonevaluative way, they increase the flexibility of their view of people and things, expand their limited experiences and feelings, and can regulate their emotions. Vujanovic et al. (2010) showed that the greater the use of mindfulness, the lower is the difficulty of emotion regulation. Thus, mindfulness helps individuals regulate their emotions. As a key factor in successful SR (Evans et al., 2009), mindfulness has a positive impact on SWB through the SR of both motivation (Brown & Ryan, 2003) and emotion (Weytens et al., 2014).

Therefore, there is a logical chain, as follows: AP leads to imbalance in SR of motivation and emotion, which affects SWB. Mindfulness can supplement the SR of motivation and emotion, and is consequently also related to AP and SWB (Sirois & Tosti, 2012). Thus, we proposed the following hypothesis:

Hypothesis 2: Mindfulness will mediate the relationship between academic procrastination and subjective well-being.

Moderating Role of Self-Efficacy

Self-efficacy (SE) is individuals' belief that they can reliably perform the required tasks to achieve their goals (Bandura, 1977). The relationship between SE and procrastination was defined by Bandura (1986). In general, procrastinators have low SE, and SE can predict procrastination (Corkin et al., 2014; Haycock, 1993). This may be because SE is an important motivational dimension of self-regulated learning, which is negatively associated with AP (Wolters, 2003). The relationship between AP and SE is negatively mediated by attributional style—in which individuals develop causal reasoning to explain events or behavior (Bao, 2007)—partly by emotions directly linked to academic learning, classroom instruction, and achievement (C. C. Wang, 2010), and completely by self-control in academic matters (Liu et al., 2020). Low SE may lead to a failure spiral (Lindsley et al., 1995), and procrastination may lead to poor performance, which can reduce SE and lead to further procrastination. However, SE can regulate procrastination owing to its SR function.

The main SR function of SE is its regulation of motivation. According to social cognitive theory (Bandura, 1986), SR requires self-control skills, as well as knowledge and individual motivation to employ these skills in relevant situations. SE is especially suitable to explain motivational changes as individuals regulate their own operations. SE can strengthen or weaken individuals' motivation. Individuals with high (vs. low) SE will choose more challenging tasks and set themselves higher goals. When they act, they will expend greater effort, persist for longer periods, and recover more quickly from setbacks (Bandura, 1997).

The SR function of SE also entails emotional regulation. Individuals with high SE tend to view their emotions in a healthy, positive way and organize their emotional experiences according to an ideal mode (Bandura, 1997). Therefore, SE is a key factor in emotion regulation (DeSteno et al., 2013). Saarni (1999) found that the level of SE has an impact on emotion regulation because as individuals gain confidence in emotional processing, they attain sufficient motivation to fully perceive, analyze, or infer emotional experience. Thus, SE is conducive to emotion regulation. In a practical sense, SE improvement has been

found to regulate anxiety, depression, and panic among patients (Bandura, 1997). Choi and Moran (2009) and Chu and Choi (2005), when examining the relationships between procrastination, SE, and SWB, differentiated two types of procrastinators: passive and active. *Passive procrastinators* are traditional and are paralyzed by their indecision to act and their failure to complete tasks on time, whereas *active procrastinators* prefer to work under pressure; thus, they intentionally procrastinate. Active (vs. passive) procrastinators have higher (vs. lower) motivation, SE, and SWB, and more positive (vs. negative) emotions. Each type has different motivation, emotions, and SWB, despite exhibiting the same AP behavior. Such a difference may be because SE adjusts procrastinators' motivation and emotions, which changes their feelings.

There is also a positive relationship between several forms of SE and mindfulness. For example, mindfulness can improve adolescents' SE in relation to substance use, effectively reducing their consumption of harmful substances (Britton et al., 2010). Because acceptance-based mindfulness approaches encourage individuals to relinquish their psychological and emotional struggle with pain, mindfulness has been shown to improve pain SE (Cusens et al., 2010). Better use of mindfulness skills (e.g., describing, acting with awareness, and accepting without judgment) is associated with higher coping SE, and coping SE serves as a potential mediator in the relationship between mindfulness and emotional regulation difficulties (Luberto et al., 2014). Procrastinators can also improve their SE via mindfulness (Motie et al., 2019). As mindfulness and SE function in ways similar to those of SR and share a negative association with AP, we speculated that SE would regulate the relationship between AP and SWB in college students, and that this regulatory effect would be achieved through the mediator of mindfulness. Thus, high SE would help college students maintain mindfulness in the face of AP, and protect them from experiencing a decline in SWB. Therefore, we proposed the following hypothesis:

Hypothesis 3: Self-efficacy will play a moderating role in the relationship between academic procrastination and mindfulness, such that for college students with high (vs. low) self-efficacy, there will be a weaker negative correlation between academic procrastination and mindfulness.

The integrated framework of this study, in which mindfulness mediates the relationship between AP and SWB and SE moderates the relationship between AP and mindfulness, is shown in Figure 1.

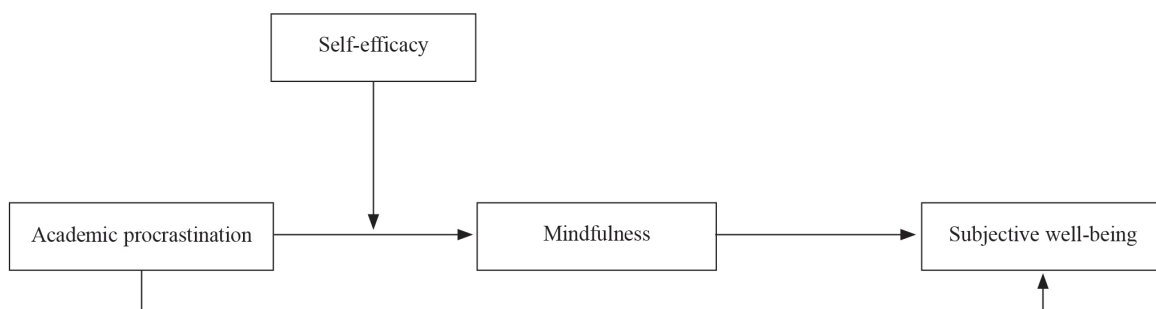


Figure 1. *Study Conceptual Model*

Method

Participants and Procedure

From March to June 2019, we posted a notice on campus to students at Hangzhou Normal University (Zhejiang), Xiamen Institute of Technology (Fujian), and Huizhou College (Guangdong) in China to recruit participants, who signed informed consent forms before completing the survey. All participants took part

voluntarily and were given a description of the study objective, instructions, and monetary compensation for their participation. Ethical approval was given by the Ethics Committee of Jilin University.

We administered 597 surveys to participants, of which 568 were returned (response rate = 95.14%) and 512 were valid. Of the participants, 353 (68.9%) were women and 159 (31.1%) were men ($M = 1.69$, $SD = 0.46$). Regarding level of education, 254 (49.6%) were freshmen, 122 (23.8%) were sophomores, 95 (18.6%) were juniors, and 41 (8%) were seniors ($M = 1.85$, $SD = 0.99$). Participants were aged between 18 and 22 years.

Measures

Higher scores on all measures indicate higher levels of the variable, except the reverse-scored AP items, which indicate the opposite.

Academic Procrastination

We measured AP with the Chinese revised version (Chen et al., 2008) of the 19-item Aitken Academic Procrastination Scale (Aitken, 1982). Participants indicate the degree of truthfulness on a 5-point Likert scale ranging from 1 (*true*) to 4 (*false*), with 10 items forward-scored and nine reverse-scored. A sample positively scored item is “I always wait until the last minute to start doing things,” and a sample reverse-scored item is “I always get my daily tasks done on schedule.” Cronbach’s alpha was .85 in this study.

Subjective Well-Being

We measured SWB using the 48-item Chinese revised version (J. H. Duan, 1996) of the General Well-Being Schedule (Fazio, 1977). The 18 SWB items comprise three dimensions: positive emotions, negative emotions, and health experience, of which participants respond to 14 items using a 6-point Likert scale ranging from 1 (*extremely so*) to 6 (*not at all*) and to four items using a 10-point Likert scale ranging from 1 (*very depressed*) to 10 (*very cheerful*). A sample item is “Has your life been happy, fulfilling, or enjoyable (during the past month)?” Cronbach’s alpha was .73 in this study.

Mindfulness

We assessed mindfulness using the revised Chinese version (Deng et al., 2012) of the 15-item MAAS (Brown & Ryan, 2003). Participants respond on a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). A sample item is “I find it difficult to stay focused on what’s happening in the present.” Cronbach’s alpha was .86 in this study.

Self-Efficacy

SE was measured with 10 items from the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995), revised to fit the Chinese cultural context (C. K. Wang et al., 2001). Participants rate the one-dimensional items on a 4-point Likert scale ranging from 1 (*not at all true*) to 4 (*exactly true*). A sample item is “I try my best and I am sure to solve all the problems.” Cronbach’s alpha was .84 in this study.

Control Variables

We controlled for the gender and grade of the participants because these variables could affect our results.

Data Analysis

We analyzed the data using SPSS 20.0.

Results

Hypothesis Testing

Means, standard deviations, and correlations among study variables are shown in Table 1. All scales had good internal reliability (Cronbach’s $\alpha = .73$ – $.86$). There was a negative correlation between AP and SWB, a

positive correlation between mindfulness and SWB, a negative correlation between AP and mindfulness, and a positive correlation between SE and SWB. The magnitude and direction of these correlations were consistent with our predictions and provided initial support for the hypotheses.

Table 1. Means, Standard Deviations, and Correlations for Study Variables

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Gender	1.690	0.463						
2. Grade	1.850	0.991	.081					
3. Academic procrastination	2.546	0.540	-.011	.009				
4. Self-efficacy	2.780	0.476	-.160**	-.030	-.189**			
5. Mindfulness	4.015	0.631	-.090*	.167**	-.421**	.428**		
6. Subjective well-being	4.287	0.486	.000	.042	-.491**	.164**	.315**	—

Note. *N* = 512.

* *p* < .05. ** *p* < .01.

The regression results from the hypothesis testing are shown in Table 2. In Model 3, AP was negatively related to SWB. Thus, Hypothesis 1 was supported.

Hypothesis 2 was examined in Models 1, 2, and 4. In Model 1, AP was negatively related to mindfulness, and mindfulness was positively related to SWB in Model 2. In Model 4, the relationship between AP and SWB remained significant when mindfulness was added as a mediator, showing that mindfulness partly mediated the relationship between AP and SWB. Thus, Hypothesis 2 was supported.

Table 2. Regression Results for Mediation and Moderation Testing

Variable	Mindfulness		Subjective well-being		
	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	-.109**	.030	-.009	.005	-.050
Grade	.179***	-.014	.047	.024	.184***
Academic procrastination	-.423***		-.491***	-.438***	-.338***
Mindfulness		.320***		.127**	
Self-efficacy					.367***
Academic procrastination × Self-efficacy					-.077*
<i>F</i>	47.166***	18.835***	54.414***	43.574***	53.102***
ΔR^2	.213	.095	.239	.250	.338

Note. *N* = 512.

* *p* < .05. ** *p* < .01. *** *p* < .001.

Hypothesis 3 was tested in Models 2 and 5. In Model 2, SWB was significantly influenced by mindfulness. When SE and the interaction of AP × SE were incorporated, the interaction was significantly positive, meaning that SE was a moderator. Thus, Hypothesis 3 was supported.

To further analyze the moderating effect of SE, we divided participants into a low SE group (*M* – 1 *SD*) and a high SE group (*M* + 1 *SD*), then performed a simple slope test (see Figure 2). AP was negatively related to

mindfulness in both the high SE group ($\beta = -.31, SE = 0.06, p < .001$) and the low SE group ($\beta = -.47, SE = 0.05, p < .001$); however, for participants with high (vs. low) SE, the negative correlation between AP and mindfulness was lower.

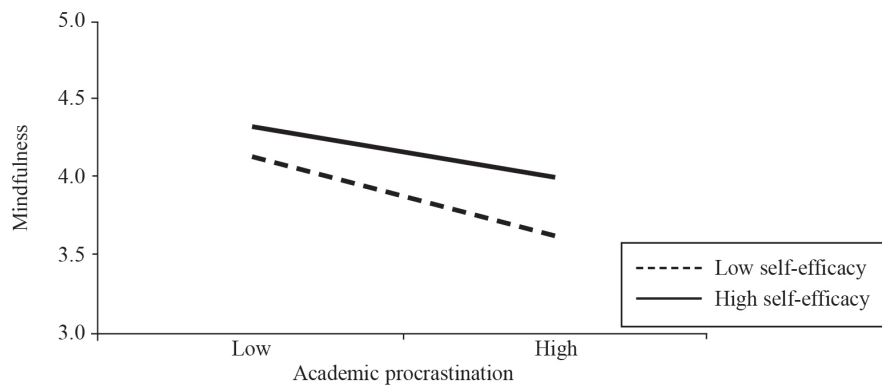


Figure 2. *Moderating Effect of Self-Efficacy in the Relationship Between Academic Procrastination and Mindfulness*

Discussion

To investigate the mechanisms of AP on SWB, we used mindfulness as the mediating variable and SE as the moderating variable. Consistent with our hypotheses, our results show that AP had a significant negative impact on SWB, and mindfulness had a significant positive effect on SWB. In addition, SE moderated the relationship between AP and mindfulness. The stronger the SE of our college student participants, the weaker was the predictive effect of AP on mindfulness.

Theoretical Implications

We used a theoretical model to examine the relationships of AP, mindfulness, SE, and SWB. Our results show that AP reduced SWB, which is likely to occur because AP causes negative consequences such as academic failure, stress, anxiety, and low life satisfaction. This finding is consistent with previous study results (Kandemir, 2014; Savithri, 2014). Further, we found that mindfulness partially mediated the relationship between AP and SWB. Because procrastinators are more likely to exhibit low mindfulness, their SR of motivation and emotion may fail. Thus, they will have low SWB, which is consistent with previous study findings (Sirois & Tosti, 2012). We also found that this mediating effect was regulated by SE. As individuals with high (vs. low) SE have a less damaged SR function, they are more confident in facing the challenges of procrastination, more likely to be in a mindful state, and better at controlling their time and emotions. Hence, the negative consequences of AP, such as reduced mindfulness and an attendant decrease in SWB, were reduced, which is consistent with Chu and Choi's (2005) results.

Practical Implications

Our results have three main practical implications: First, because AP has an important influence on SWB, reduction of the AP behavior of college students should be sought. For example, teachers can detect procrastination and intervene in the learning process of procrastinators in a timely manner using methods such as goal setting, process control, and results feedback, thus guiding their change in SWB (Balkis & Duru, 2016; Kaftan & Freund, 2018). Second, because mindfulness is also important in the improvement of

procrastinators' SWB, students' mindfulness should be cultivated through practices such as yoga and meditation, and through mindfulness-based stress reduction programs (Kabat-Zinn et al., 1992; Sirois & Tosti, 2012). Third, as SE is important for procrastinators' mindfulness and SWB improvement, students' SE should be cultivated by an increase in their sense of time control and an improvement in their learning ability (Bandura, 1982; Macan, 1994).

Limitations and Directions for Future Research

There are some limitations in this study. As the participants were students from a small group of universities in three regions of China, our conclusions require testing with a wider range of participants. Although the regression model was suitable for testing implied causal relationships between variables, the direction of causality cannot be determined from our results. According to Altman (1991), findings obtained via cross-sectional research designs are not generalizable. As longitudinal research designs provide more stable directional exploration, they could be adopted by future researchers to confirm our results. Further, although we controlled for participants' gender and grade, future researchers could add more control variables. In addition, future researchers could divide AP into categories, such as active and passive (Chu & Choi, 2005), or arousal and avoidance (Ferrari et al., 2005), and explore the mechanisms of mindfulness and SE on the SWB of the different procrastination categories to show more precisely the scope of their effects.

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