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Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences.

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Abstract

The present study sought to extend previous research suggesting a relationship between trait procrastination and health behaviors by examining the behavioral intentions of procrastinators. Two cognitive variables (self-efficacy and the consideration of future consequences) were proposed to mediate the procrastination-intentions relationship. Students (n = 182) were administered personality and health-related questionnaires and then asked to recall a past illness episode along with health behaviors that may have improved or prevented this experience. Intentions to actually perform one of the listed behaviors in the near future were then rated. A negative relation between trait procrastination and intentions to engage in health behaviors was found. Further, the weak intentions of procrastinators were mediated by a lower health-specific self-efficacy. The consideration of future consequences did not play a role in the procrastination-intentions relationship although it was moderately and negatively related to trait procrastination. These findings were consistent with the role of self-efficacy in intentions as theoretically proposed, and with previous work suggesting that procrastination is associated with low perceived behavioral control.

Trait procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences.

Procrastination has been described as a self-regulation style that involves delay in the start and/or completion of a task (Ferrari & Tice, 2000), and the avoidance of an intention and its implementation (Van Eerde, 2000). Although the negative mental health consequences of procrastination (e.g., anxiety and depression) are well established (Ferrari, 1991a; Flett, Blankstein, & Martin, 1995; Haycock, McCarthy, & Skay, 1998), recent investigations have revealed that procrastination is also associated with negative physical health consequences (Sirois, Melia-Gordon, & Pychyl, in press; Sirois & Pychyl, 2002; Tice & Baumeister, 1997). Specifically, it has been demonstrated that procrastinators tend to engage in fewer wellness behaviors such as healthy eating and exercise (Sirois et al., in press; Sirois & Pychyl, 2002), and that the poor health experienced by procrastinators may be due in part to their tendency to delay seeking care for their health problems (Sirois et al., in press).

Models of predicting health behavior initiation and completion suggest that the formation of intentions is key in determining if a behavior will be performed (Ajzen, 1985, 1991; Fishbein & Ajzen, 1975). Given that procrastination is related to fewer health-promoting behaviors, what remains then is to determine the stage in the intentions-action process that procrastinators are likely to experience difficulty that results in a lower probability of engaging in healthy behaviors. Do procrastinators form intentions to perform health behaviors such as exercising and eating healthy and then simply fall short in their efforts to successfully act on these intentions? Or do procrastinators engage in fewer healthy behaviors because they avoid forming health behavior intentions? And, what are the factors implicated in the formation of these intentions? The present study sought to address these unanswered issues by exploring the health behavior

intentions of procrastinators and the cognitive factors that may be key in the development of these intentions.

Procrastination and intentions

Current research suggests that procrastinators do not differ from non-procrastinators in their intentions to perform certain tasks. Procrastination has been found to be unrelated to job search intentions (Lay & Brokenshire, 1997), to academic work intentions (Steel, Brothen, & Wambach, 2001), and to the number of study intentions formed (Dewitte & Lens, 2000). Given these findings it has been suggested that procrastination may be a behavioral as opposed to an intentional problem (Schouwenburg & Groenewoud, 2001). Indeed, several investigations have noted that procrastinators have greater discrepancies between their intentions and actions than non-procrastinators (Beswick, Rothblum, & Mann, 1988; Blunt & Pychyl, 1998; Lay & Schouwenburg, 1993; Lay & Burns, 1991; Scher & Ferrari, 2000; Steel et al., 2001).

However, much of this research has focused on intentions to complete academic tasks that by their nature are associated with specific time frames for completion. Moreover, procrastination is often operationalized as being specific to the task being assessed, rather than viewing procrastination from a trait perspective where its relation to a wider spectrum of behaviors and intentions is considered. Therefore, it is unclear whether these findings regarding the procrastination-intentions relationship would extend into other domains such as health behaviors where time frames for completing goals are often not regulated by external sources, and where there is usually less or no time pressure to accomplish goals.

Health behaviors, intentions, and the consideration of future consequences

According to the Theory of Planned Behavior (Ajzen, 1985, 1991), health behavior intentions are one of the proximal predictors of health behaviors, mediating the influence of

attitudes and beliefs on actual behavior. Further, the development of intentions may be influenced by a variety of health-related perceptions and understandings, such as beliefs about whether the behavior will produce the desired outcome. Many health-promoting behaviors, such as exercise and diet changes, do not produce their desired results immediately and therefore require continued and often long-term commitment and effort. The ability to consider the future consequences of current behaviors may therefore be a key factor in the formation of health behavior intentions.

One construct that may be implicated in the formation of health behavior intentions and may also be related to procrastination is the *consideration of future consequences* (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994), a stable individual difference that reflects the extent to which distant versus immediate consequences of behavior is considered. CFC is proposed to capture a unique aspect of future thought, and has been shown to predict a variety of health behaviors including alcohol use, cigarette use, and environmental behaviors (Strathman et al., 1994). Procrastination has also been related to aspects of time orientation, with both decisional and avoidant procrastination negatively related to a future time orientation (Specter & Ferrari, 2000). Other research suggests that procrastinators have difficulty delaying future gratification (Ferrari & Emmons, 1995). Because health behaviors are associated with delayed rewards, intentions to engage in these behaviors may for procrastinators be linked to differences in the extent to which future consequences of these behaviors are considered.

Self-efficacy, intentions, and procrastination

Within the framework of the Theory of Planned Behavior (Ajzen, 1985, 1991) one factor that is key in determining the formation of behavioral intentions is perceived behavioral control. This refers to the extent to which one feels that the performance of a behavior is under one's

volitional control, and is often seen as synonymous with perceived self-efficacy (Ajzen, 1998; Bandura, 2000), the ability and confidence to successfully complete a behavior (Bandura, 1977, 1986). Self-efficacy (Bandura, 1977, 1986) plays a central role in the self-regulation of behavior through its effects on intention formation and strength, and persistence of action in the face of obstacles. Moreover, self-efficacy has been found to be one of the best predictors of health behavior intentions for certain health promoting behaviors (Milne & Orbell, 2000).

Given the self-regulation difficulties that characterize trait procrastination, it is not surprising that several studies suggest a relationship between procrastination and self-efficacy. Procrastination was negatively related to global measures of self-efficacy (Ferrari, 1992b; Martin, Flett, Hewitt, Krames, & Szanto, 1996; Tuckman, 1991), and to task-specific efficacy (Haycock et al., 1998) in college students. The relation of procrastination to self-efficacy is consistent with Bandura's (1977; 1986) proposition that strong efficacy beliefs promote behavior initiation and persistence whereas weak efficacy beliefs can contribute to behavior avoidance.

Conceptually, those who have lower efficacy beliefs about performing certain behaviors will be less likely to form behavioral intentions (Ajzen, 1985, 1991). Moreover, assessing domain-specific efficacy beliefs is essential for understanding the role of self-efficacy (Bandura, 1977) in the proposed relationships between procrastination and health behavior intentions. If the relation between procrastination and global self-efficacy also applies to the health domain, then the fewer healthy behaviors associated with procrastination found in recent studies (Sirois et al., in press; Sirois & Pychyl, 2002) may be explained by lower health-specific self-efficacy beliefs. Individuals who feel less competent in taking care of their health and believe that they are less likely to succeed in carrying out health behaviors (low health-specific self-efficacy) will be less likely to formulate health behavior intentions. Thus, it is possible that the lower self-efficacy of

procrastinators may influence health behaviors through its role in the formation and strength of health behavior intentions.

The present study

The goal of the present study was to build on recent findings regarding procrastination and health behaviors by exploring the link between trait procrastination and health behavior intentions. Specifically, two cognitive variables that may mediate this relationship were examined – consideration of future consequences, and self-efficacy (see Figure 1). In accordance with the Theory of Planned Behavior (Ajzen, 1985, 1991), and Bandura's (1977) assertion that self-efficacy is best assessed with a domain specific efficacy measure, a health-specific self-efficacy scale was used to examine the links between procrastination and intentions to engage in health behaviors. In order to increase the salience and validity of the health behavior intentions, health behaviors were generated in response to an actual illness experience, with intentions to perform these behaviors in the future rated. Health status was also assessed, partly to replicate previous findings regarding the health states of procrastinators (Sirois et al., in press; Tice & Baumeister, 1997), and also to establish the context in which health-specific self-efficacy beliefs may be operating.

Methods

Participants

Participants were 182 (121 females, 61 males) introductory psychology students attending Carleton University, Ottawa, Canada who completed the preventive health behavior task (see data screening for full details). Mean age of the students was 21.06 (*SD* = 4.45), ranging from age 18 to 51. The majority of the students were Caucasian (81.3%), 13.2% were Asian or Middle Eastern, 2.2% were African American, 1.6% were Hispanic, and 1.1% were

Aboriginal. Most students were enrolled in their first year (71.1%) or second year (23.3%) of study. All students participated for extra course credit.

Procedure and materials

Upon arriving at the laboratory, participants were provided with a cover story about how the study involved examining the different beliefs that people have about their health. Participants were then administered self-report questionnaires presented in three separate packages and instructed to complete the packages in the order they were marked, returning each completed questionnaire to its original envelope before moving on to the next package. Participants were tested in groups of 1 to 5.

The first package contained background questions about general and health information, as well as several personality questionnaires. The second package involved the illness experience and preventative behavior task. The final package included more individual difference and health belief questionnaires. Only those measures included in the current study are mentioned.

Health status. The number and type of health problems was assessed using the Brief Medical History questionnaire, a physical health problem checklist adapted for the current study from the Brief Medical and Treatment History (Sirois & Gick, 2002). The checklist includes 13 acute physical health problems (e.g., colds, headaches, digestive problems) and 10 chronic physical health problems (e.g., asthma, diabetes, arthritis), and the respondent indicates whether or not the health problem was experienced within the past 6 months. Scores for each of the acute, chronic, and total health problems scales are calculated by summing the number of health problems checked.

State negative affect. A measure of state negative affect was included, as research suggests that state negative affect may inflate self-reports of health (Watson & Pennebaker,

1989). The negative affect subscale of the Positive and Negative Affect Scale (PANAS; (Watson, Clark, & Tellegen, 1988) was used for the current study. The PANAS consists of 20 items consisting of words describing different feelings (e.g., angry, upset), with 10 items for each of the positive and negative affect scales. Respondents rate the extent to which they are currently experiencing each of these feelings on a 5-point Likert scale ranging from 1 for *very slightly or not at all* to 5 for *extremely*.

Procrastination. Trait procrastination was assessed with Lay's General Procrastination scale (GP; Lay, 1986). This 20-item scale assesses global tendencies towards procrastination across a variety of daily tasks and has been used previously to assess the relation of procrastination to health-related behaviors and cognitions (Sirois, in press; Sirois et al., in press). Items such as "I am continually saying I'll do it tomorrow" are scored on a 5-point Likert-type scale ranging from 1 for *false of me* to 5 for *true of me*. The scale includes 10 reverse-scored items, and the mean of all items yields a single composite score with high values indicating a higher tendency to procrastinate. The GP has demonstrated good internal consistency (Cronbach's alpha = 0.82; Lay, 1986), and good stability with a test-retest reliability of .80 (Ferrari, 1989). The internal consistency for the current sample was very good (Cronbach's alpha = .90). Ferrari (1992b) suggests that the GP is an effective measure of dilatory behavior across different situations.

Health efficacy. Health-specific self-efficacy was measured with the Health Efficacy subscale of the Control Beliefs Inventory (Sirois, 2003). This subscale contains 8 items that assess feelings of competence and confidence in being able to carry out actions important for maintaining and taking care of one's health. The scale includes 5 items such as "I am confident that I can successfully look after my health" that are scored in the positive direction as well as 3

reverse scored items (e.g., "When it comes to my health, I often feel unable to do what I know should be done"). Respondents rate the extent to which each statement applies to them on a 6 point Likert scale ranging from 1 for *strongly disagree* to 6 for *strongly agree*. The Health Efficacy subscale has demonstrated good psychometric properties with good convergent validity (r = .45; (Sirois, 2003) with the Generalized Self-Efficacy scale (Schwarzer & Jerusalem, 1995). The Health Efficacy scale has also shown good internal consistency with a community sample (n = 95, Cronbach's alpha = .86) and a student sample (n = 331, Cronbach's alpha = .82). The internal consistency for the current sample was very good (Cronbach's alpha = .84).

Recalled actual illness experience. In the second package, participants were instructed to vividly recall and briefly describe an actual physical illness that they had experienced and that had been bothersome. They were then instructed to list specific actions that may have improved or prevented the illness experience. This was done to ensure that the health behaviors and intentions to perform these behaviors were personally relevant and to bring attention to the consequences of not performing these behaviors.

Intentions for preventative health behavior. Following the illness experience writing task, participants were asked to refer to the experience they had described and to choose a preventative action from the list they had generated. The following instructions were given:

> Often we intend to do things that we know would help our health, but we don't always follow through. For example, we may plan to start an exercise program or avoid unhealthy foods, but things such as money, time, temptation, or other plans make it difficult to actually follow through. Choose one of the preventative actions (for example, doing something or avoiding something) that you stated could have made your illness experience better. Please write this action in the space provided.

Intentions to actually perform the behavior that they listed were then assessed on a 5-point Likert scale ranging from 0 (*I have no intention of doing this in the near future*) to 4 (*I am certain that I will do this in the near future*). The single rating for this behavior was the dependent variable for the analyses.

Consideration of Future Consequences. The third and final package included several health belief questionnaires along with the Consideration of Future Consequences scale (CFC; Strathman et al., 1994). This 12-item measure assesses individual differences in the extent to which immediate versus distant consequences of behavior is considered. Individuals who are high in CFC consider the future consequences of their behavior and endorse statements such as "I consider how things might be in the future, and try to influence those things with my day-to-day behavior" and "I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes". In contrast, individuals low in CFC focus more on immediate concerns and needs and endorse statements such as "My convenience is a big factor in the decisions I make or the actions I take" and "I only act to satisfy immediate concerns, figuring the future will take care of itself". The CFC scale has demonstrated good internal consistency in previous studies with coefficient alphas ranging from .80 to .86 (Strathman et al., 1994). The alpha coefficient for the current sample was .82.

Results

Data screening

Because the intention to perform a health behavior was the main outcome variable, the responses to illness experience and preventive health behaviors data were screened to ensure that tasks were properly completed and that the intentions related to health behaviors. Nine participants left one or both sections of the task incomplete, and 11 participants wrote that there

was nothing that could have been done to prevent or improve their illness experience and subsequently left the health behavior section blank. Seven participants wrote about a mental health problem (e.g., anxiety) and 12 participants listed an interpersonal experience (e.g., break-up of a relationship) rather than a physical illness experience. Because each of these 19 participants listed something other than a health behavior that could have improved their situation (e.g., "expressing my feelings more") they were excluded from the study. Compared to the full sample of 182, the excluded students were similar in age (M = 20.41, SD = 4.24) ranging from 14 to 45 years, and the majority were also first year (65.8%) or second year (23.7%) students. Although there was a greater proportion of males (41%) in the excluded sample than the full sample (33.5%) this difference was not significant, χ^2 (1, N = 221) = .80, *ns*. The ethnic profiles of the two groups were also similar, with the majority of the excluded sample being Caucasian (79.5%).

Descriptive statistics

The procrastination scores of the current sample (M = 2.87, SD = .71) were comparable to those reported in previous research with a university student sample (e.g., M = 2.81, SD = .62; Blunt & Pychyl, 2000). For descriptive purposes, potential differences in health status were examined by comparing the participants classified as either low procrastinators (N = 92) or high procrastinators (N = 90) based on a median split (median = 2.74) of the GP scores. Health status was calculated by summing the number of overall health problems reported, and further dividing health problems according to whether they reflected acute or chronic health issues. A one-way analysis of variance (ANOVA) for each of the health status variables revealed that high procrastinators reported significantly more (F(1, 180) = 6.24, p = .013) acute health problems (M = 4.02, SD = 1.88) than low procrastinators (M = 3.33, SD = 1.97). The two procrastination

groups did not differ in the number of overall health problems (high $M = 4.60$, $SD = 2.11$, versus low $M = 3.99$, $SD = 2.53$, $F(1, 180) = 3.13$, *ns*) or chronic health problems (high $M = .66$, $SD = .94$, versus low $M = .58$, $SD = .81$, $F(1, 180) = .43$, *ns*) reported. In order to ensure that negative affect was not biasing the reporting of physical problems, the ANOVA for acute health problems was rerun, this time covarying for state negative affect assessed by the negative affect subscale of the PANAS (Watson et al., 1988). State negative affect was not a significant covariate ($F(1, 178) = 1.97$, *ns*) and the group differences in acute health problems remained significant ($F(2, 178) = 3.91$, $p = .02$).

The most commonly recalled illness experiences included head colds, flus, fever, pneumonia, headaches, and back injury. In general the types of health behaviors listed by the participants could be broadly categorized as health-promoting and preventive behaviors. Behaviors included eating healthier and avoiding junk food, getting more exercise, improving sleep habits, and other stress management behaviors. Several students also listed seeking and/or following medical advice for their health problem as a health-promoting behavior.

To examine the main hypotheses, correlational analyses were conducted with each of the main variables. Bi-variate correlations for each of the predictor variables and the health behavior intentions are presented in Table 1. As expected, procrastination was negatively related to health behavior intentions, consideration of future consequences (CFC), and health-specific efficacy. Further, both health efficacy and CFC were positively related to health behavior intentions, suggesting that a mediation analyses of these variables was appropriate.

Mediational analyses

The proposed mediational models of the effect of procrastination on health behavior intentions were tested using a process analysis. According to Judd and Kenny (1981) three

conditions need to be satisfied in order to demonstrate mediation. The predictor variable (procrastination) must be related to the outcome variable (intentions) and the proposed mediator variable(s) (CFC and health efficacy). The mediator variable(s) must also be related to the outcome variable after controlling for the predictor variable. Finally, mediation is established when, after controlling for the mediating variable, the predictor variable exerts no effect upon the outcome variable.

The results for the proposed mediators CFC and health efficacy in the relationship between procrastination and health behavior intentions are presented in Table 2. The standardized regression coefficients for each predictor are presented, as well as the change in variance attributable to each variable entered into the regression equation (R^2 change). When two predictor variables are included in the same analyses, the regression statistics reflect the effect of each variable when entered into the regression equation last.

Consideration of future consequences as a mediator of the procrastination-intentions relationship. The role of CFC in mediating the relationship between procrastination and health behavior intentions was not supported by the process analyses. Although both procrastination and CFC predicted health behavior intentions, CFC failed to affect intentions when the influence of procrastination was controlled, and therefore the second condition of mediation was not met (Judd & Kenny, 1981).

Health efficacy as a mediator of the procrastination-intentions relationship. The mediational role of health efficacy in the procrastination-intentions relationship was supported (see Table 2). Procrastination was related to health efficacy, which in turn was associated with health behavior intentions. Health efficacy continued to exert an influence over health behavior intentions when the effects of procrastination were controlled, and explained an additional 5

percent of the variance in health behavior intentions beyond that explained by procrastination. However, the influence of procrastination on health behavior intentions was no longer significant once the effects of health efficacy were removed, thus satisfying all three conditions of mediation (Judd & Kenny, 1981). The revised mediational model is presented in Figure 2.

Discussion

The present study sought to extend previous research that suggested a relationship between trait procrastination and health behaviors by examining the health behavior intentions of procrastinators to help clarify the processes underlying this relationship. Unlike previous research that suggests that procrastinators do not differ from non-procrastinators in terms of the formation and strength of their intentions (Dewitte & Lens, 2000; Lay & Burns, 1991; Steel et al., 2001), a negative relation between trait procrastination and intentions to engage in self-chosen health behaviors was found. Further, the weak intentions of procrastinators were explained by a lower perceived competence in being able to perform these health behaviors. Consideration of future consequences (CFC) did not play a role in the relationship between procrastination and intentions although it was negatively related to procrastination.

The negative relation between procrastination and intentions found in the present study may be explained by differences in the nature of health behaviors as compared to other tasks. The time frames for completing academic tasks are externally set and regulated whereas most health behaviors are engaged in by choice. Therefore, procrastinators may feel more compelled to express intentions to engage in academic tasks because their choice to perform these tasks is not perceived to be under their own control. It is also possible that the specific instructions given about rating intentions may have minimized social desirability by suggesting that not getting around to certain health behaviors is something that many people experience. Because

procrastination is associated with self-presentation strategies (Ferrari, 1991b; Ferrari, 1992a), questions about intentions to engage in academic tasks and behaviors asked of students in an academic setting may illicit response biases that could influence the reporting of intentions.

The hypothesized relationship between procrastination and health-specific self-efficacy was also supported, extending previous findings regarding this link into the health domain. Moreover, the lower health efficacy of procrastinators provided a plausible explanation for their weaker health behavior intentions. This finding is consistent with the tenets of the Theory of Planned Behavior (Ajzen, 1985, 1991) and with previous procrastination research that suggests that procrastination is greater on tasks where perceived incompetence is higher (Milgram, Sroloff, & Rosenbaum, 1988).

According to Bandura's social cognitive theory of behavior (1977), once an enhanced sense of self-efficacy is established it will tend to generalize to other situations where self-doubts may hamper performance. Conversely, it may be that the lower health-specific self-efficacy of procrastinators noted in the present study reflects a generalization of the global feelings of inability to successfully complete tasks that may characterize procrastination (Ferrari, 1992b; Martin et al., 1996; Milgram et al., 1988; Tuckman, 1991). Self-efficacy is also enhanced or diminished by performance accomplishments (Bandura, 1977). In addition, outcome expectancies are often implicitly included in perceived self-efficacy (c.f. Schwarzer & Fuchs, 1996). Sirois (Sirois et al., in press) found that both increased stress and poorer health protective behaviors mediated the relationship between procrastination and poor health, and procrastinators also reported more acute health problems in both the current study and a recent longitudinal study (Sirois & Pychyl, 2002). The poor health of procrastinators, whether it be mediated through behavioral (poor health behaviors) or reactive (stress as a result of behavioral choices)

pathways could also be perceived as failed outcomes for any actions that were taken to enhance or maintain health and thereby decrease health-related self-efficacy. This in turn may lead to less likelihood to form intentions to perform these behaviors in the future.

Self-efficacy is the proximal cognitive determinant in both intentions and actual behavior (Conner & Sparks, 1996; Schwarzer & Fuchs, 1996). Thus, it is possible that health-specific self-efficacy may have direct effects on the health behaviors of procrastinators through its influence on sustained effort and behavioral control in the face of temptations and setbacks (Bandura, 2000; Schwarzer & Fuchs, 1996). For those intentions that are formed and acted upon, successfully engaging in the health behavior (e.g., eating healthier) may be hindered by low confidence in one's ability to persist in the efforts necessary to make these lifestyle changes. The fewer healthy behaviors reported by procrastinators in previous investigations (Sirois et al., in press; Sirois & Pychyl, 2002) may therefore be due to the effects of health efficacy on both intentions and behaviors.

Although consideration of future consequences (CFC) did not play a role in the relationship between procrastination and health behavior intentions, CFC was moderately correlated (r = - 43) with procrastination and only modestly related to intentions (r = .18). For individuals with low CFC, the intrapersonal struggle between present behavior and the set of immediate outcomes versus distant outcomes is resolved in favor of acting to satisfy short-term needs (c.f. Strathman et al., 1994). Procrastination is similarly associated with trade-offs (Lay & Silverman, 1996; Sirois et al., in press; Tice & Baumeister, 1997), behaviors where short-term benefits are chosen at the risk of long-term costs (Baumeister & Scher, 1988). Further, procrastinators have difficulty delaying gratification (Ferrari & Emmons, 1995) and think less about the future (Specter & Ferrari, 2000). In relation to trait procrastination, low CFC implies

that chronic procrastinators may not follow through with the behaviors that will improve their future outcomes simply because they do not consider the future outcomes as important as the immediate benefits of not performing those behaviors. Further research is needed to explore if CFC reflects a cognitive component of procrastination that accounts for the preference for trade-offs, and if perhaps CFC influences the actual behaviors rather than the intentions of procrastinators.

Conclusions regarding the causal links implied by mediational model in the current study are limited by the single data collection. Ideally, the mediating variables (health efficacy) should be measured prior to the assessment of health intentions if causality is to be assumed (Kline, 1998). Although the sample was generally young and healthy, conclusions regarding the health behavior intentions found in the current study may be generalized to other healthy adult samples. The intentions were generated in response to an actual recalled illness episode where the practice of the health behaviors may have resulted in improved circumstances. Thus, the consequences of not engaging in these behaviors were apparent.

In summary, it appears that procrastinators may engage in fewer healthy behaviors because of weaker intentions to engage in these behaviors. Ferrari's (Ferrari, Parker, & Ware, 1992) suggestion that chronic procrastinators feel that they do not have much mastery over their own behavior may extend beyond the academic realm to the health domain. Health-specific self-efficacy reflects a sense of control over one's health. The current findings suggest that procrastinators may not feel capable of engaging in actions necessary for looking after their health and therefore they may not form strong intentions to perform these behaviors. Further research is needed to determine the direct effects of both health-specific efficacy and the consideration of future consequences on the health behaviors of procrastinators. Along with the

current investigation, such research would contribute to a growing understanding of how the self-regulation difficulties associated with procrastination may contribute to poor health.

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Author Note

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Table 1. Bi-variate correlations between procrastination, consideration of future consequences (CFC), and the health-related variables.

Variables	CFC	Health efficacy	Health behavior intentions	Acute health problems
Procrastination	-.43**	-.37**	-.21**	.16*
CFC	---	.31**	.18*	-.09
Health efficacy		---	.28**	-.31**
Health behavior intentions			---	-.02

Note: $N = 182$, * $p < .05$, ** $p < .01$.

Table 2. Regression analyses of the proposed procrastination-health behavior intentions mediational model

Outcome variable	Predictor variable	β	t	R^2 change	F change
	CFC				
Intentions	Procrastination	-.21	-2.83**	.04	8.00**
CFC	Procrastination	-.43	-6.41***	.19	41.13***
Intentions	CFC	.18	2.50*	.03	6.23*
Intentions	1. CFC	.12	1.43	.01	2.05
	2. Procrastination	-.16	-1.94*	.02	3.77*
	Health efficacy				
Intentions	Procrastination	-.21	-2.83**	.04	8.00**
Health efficacy	Procrastination	-.37	-5.33***	.14	28.37***
Intentions	Health efficacy	.28	3.93*	.08	15.46***
Intentions	1. Health efficacy	.24	3.01*	.05	9.60**
	2. Procrastination	-.12	-1.55	.01	2.40

Note: When two predictor variables are included in the same analyses, the regression statistics reflect the effect of each variable when entered into the regression equation last.

When 1 predictor is entered, F value is for (1, 180) degrees of freedom; when two predictors are entered, F value is for (1, 179) degrees of freedom

$N = 182$, * $p < .05$, ** $p < .01$, *** $p < .001$

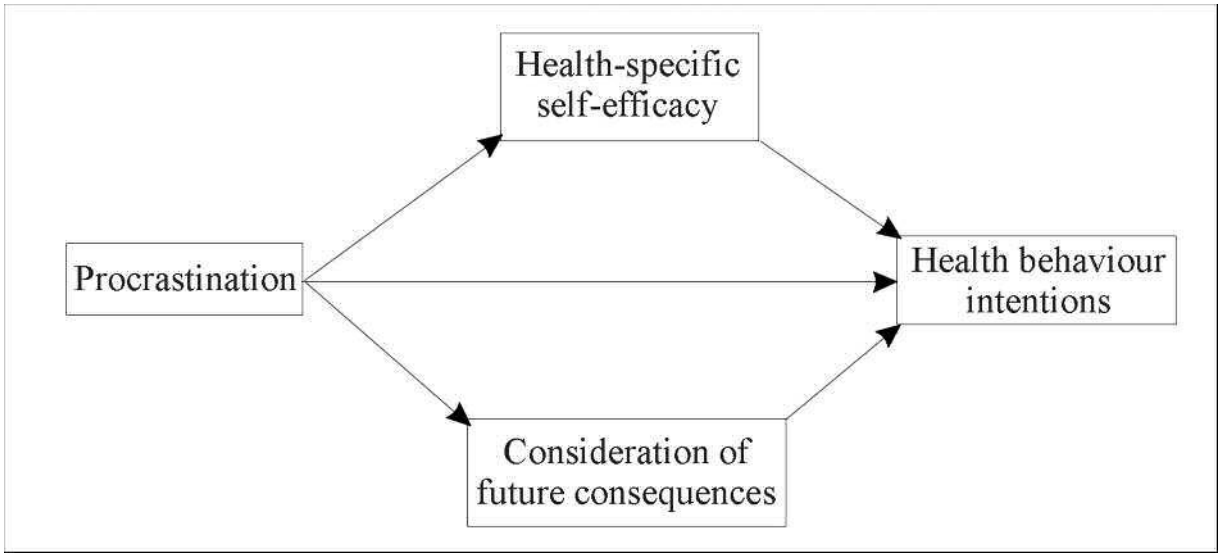
CFC = Consideration of future consequences

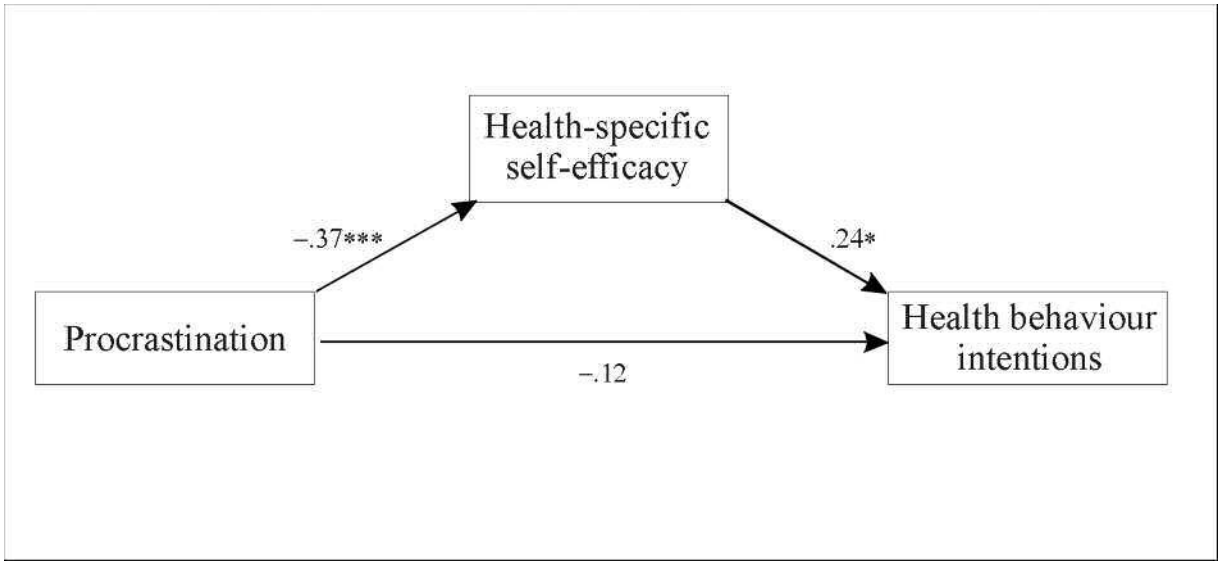
Figure Captions

Figure 1. Proposed mediational model of the relationship between procrastination and health behavior intentions

Figure 2. Revised mediational model of the relationship between procrastination and health behavior intentions. Values reflect standardized regression coefficients.

* $p < .05$; ** $p < .01$


Health-specific self-efficacy
Procrastination
Health behaviour intentions
Consideration of future consequences


Health-specific self-efficacy
−.37***
.24*
Procrastination
Health behaviour intentions
−.12