

The Influence of Length of Delay and Task Aversiveness on Procrastination Behaviors

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Abstract

Procrastination is a common form of self-regulatory failure that is not entirely understood. Since procrastination is becoming increasingly prevalent in work and academic environments, it is critical to determine procrastination's causes in order to mitigate it. In this study, an experiment is conducted to examine whether procrastination is impacted by (1) the amount of time until the task is due or (2) the aversiveness of the task. Results demonstrate that people are more likely to delay on more aversive tasks, but we did not find any significant relationship with the length of delay. Previous findings on the influence of task aversiveness in procrastination are confirmed in the experiment. Findings and future directions for research on procrastination are discussed.

Keywords: procrastination, length of delay, task aversiveness

1. Introduction

"There's still a week until the deadline, so I'll take a nap first." Often in our lives we hear people present this sentiment, and we frequently express it ourselves. Procrastination is a problem for almost everyone. Students put off their assignments until the last day before deadline; employees are often distracted by internet messaging and games while at work. Procrastination may be on the rise in part due to the allure of distractions in the form of electronic devices and other entertaining activities (Steel, 2007). Regardless of the cause, rising trends make procrastination a critical area of study for modern times.

Psychologists and behavioral economists have refined their definition of procrastination over time. Ellis and Knaus (1977) explain procrastination as a failure to initiate or complete a task or activity by the predetermined time. Solomon and Rothblum (1984) describe it as the act of needlessly delaying tasks to the point of experiencing subjective discomfort. In this study, procrastination is defined as needlessly delaying the task one intended to complete. The delay may bring temporary pleasure, but it rarely results in satisfactory outcomes in the long term.

The intention-action correlation is a useful framework for understanding and measuring procrastination. In the context of procrastination, the intention-action correlation refers to a comparison between the time one intends to complete a task and the time it actually takes to complete the task. A positive intention-action correlation occurs when people who intend to finish the task at a determined deadline actually do so. Procrastination is a negative intention-action correlation, in which the task is planned to be completed by a specific time but is not.

Academic procrastination is fairly common among college students. More than 70 percent of students procrastinate in academic tasks, and students who have the highest level of academic procrastination tend to have lower scores and are less likely to attend classes (Moore, 2008). Fortunately, evidence indicates that most students recognize that they are procrastinators, and are willing to impose some regulations to prevent their procrastination, such as setting deadlines or blocking themselves from internet (Bisin & Hyndman, 2014). These findings have prompted researchers to identify possible solutions such as setting self-regarded deadlines, but the effectiveness of these approaches still requires further examination. Many believe that procrastination is largely a self-regulatory failure that therefore requires strategies to promote self-regulation (Steel, 2007).

However, there is reason to consider factors beyond individuals' self-regulatory abilities in considering why

procrastination occurs. As will be discussed subsequently in greater detail, there is strong reason to believe that the nature of a task is an important contributor to individuals' procrastination behaviors (Steel, 2007). For this reason, in this paper, we will examine how key characteristics of a task may contribute to individuals' propensity to procrastinate.

By focusing on how features of a task influence procrastination, this study aims to expand the realm of procrastination strategies beyond an exclusive focus on individuals' self-regulatory abilities. We hypothesize that procrastination can be addressed proactively by altering how a task is presented. For example, both length of delay and task aversiveness are task-elements that could be controlled by the task-giver (e.g., the professor or employer) to make a task less procrastination-inducing. Hypothetically, when a task is presented with a deadline that is not perceived as far-off, the performer would likely procrastinate less. In addition, if the task is presented in a way that sounds appealing, the performer would be less likely to put it off. The present study aims to provide evidence that sheds light on these possibilities.

2. Literature Review

In this section, I will review how existing research indicates that the characteristics of the task itself are a key contributor to procrastination (i.e. a negative intention-action correlation), specifically, the length of delay and task aversiveness.

First, the timing of a task may impact the likelihood it is completed on time. When a task is viewed as being in the distant future, people believe it is of less urgency and thus are more likely to put off the task in the present (Steel, 2007). For instance, when students are assigned a paper at the beginning of the semester that is due at the end of the school year, it is very likely that they will put the task off for a few months. The fact that the paper has a distant deadline encourages the students to view it as not very pressing, and they consequently delay working on the paper. Temporal proximity is thus posited as a cause of procrastination in that it is natural for people to use the nearness of the task to predict the length of delay before completing it (Steel, 2007).

A shortcoming of existing research on temporal proximity and procrastination is that it is mostly observational and survey-based. Little experimental research has examined the role of time in decision-making, i.e., how the strength of intention-action correlates with length of delay. For this reason, it is not clear whether individuals' procrastination behaviors would differ if the same task was assigned with different deadlines. Researchers hypothesize that since the likelihood of unforeseen events tend to increase as time passes, we should find a stronger intention-action correlation within shorter periods of delay (Steel, 2007). However, more empirical research is necessary to test the impact of length of delay on procrastination. This evidence could help educators and employers to better understand students' and employees' behavior, and thus how to phrase task instructions in a way that reduces procrastination.

Second, theoretical scholarship argues that task aversiveness contributes to the delay of a task. As its name implies, task aversiveness, also called task appeal (Harris & Sutton, 1983), is the task's perceived unpleasantness. For example, intensive vocational tasks such as working overtime sounds more aversive than recreational activities like going to a movie. Scholars argue that individuals are likely to procrastinate more on stressful projects because people tend to avoid or put off a task that is unwanted or that they find unbecoming (Hermon, Grossman-Baklash, & Sela, 1992). For example, when individuals believe that they might have cancer, they will not go to the doctor immediately but wait for several months; since the idea of getting cancer is distressing and unwanted, people will delay receiving the result.

While many studies have been conducted in this area, a notable flaw in the research so far is that the majority has used survey methodology in which the research topic is relatively obvious to the participant. Therefore, this research methodology introduces undesirable bias: participants might intentionally act in a way that they think would favor or not favor the researcher, making the research result less valid. For this reason, the field would benefit from studies that use experimental methods to test the influence of task-aversiveness on intention-action correlation. Again, better understanding the implications of task aversiveness could assist educators and employers in how they frame tasks that are given to their students and employees, respectively.

3. Present Study

This study investigates how features of a task impact individual's procrastination behaviors (i.e., intention-action correlation).

Specifically, the research questions of this paper are:

1. *To what extent does the length of delay predict the intention-action correlation?*
2. *To what extent does the task aversiveness predict the intention-action correlation?*

Results from this study will address the gaps of understanding in how the length of delay impact procrastination and will also more rigorously test the effect of task aversiveness on procrastination that is indicated by previous research. In a more practical sense, this research will aid employers and educators to better understand their employees' and students' behavior, and contribute to future research that aims to mitigate procrastination in schools, workplaces, and other settings.

4. Methodology

4.1 Overview

Based on methods utilized by previous research, this study involves an online experiment with a real-effort task. Participants were recruited online from JobBoy. They completed two reading tasks that varied in their level of difficulty, which was used to examine the role of task aversiveness in predicting procrastination. The influence of length of delay was investigated by assigning participants to one of two experimental conditions that had varying deadlines (i.e., one-week and two-weeks). Comparison were then made between the time participants planned to complete the task and the time they actually take to complete the task

4.2 Sample Size

89 participants for the experiment were recruited from JobBoy. Participants were approximately equally distributed across the two experimental conditions. The one-week task included 42 participants, and the two-weeks task contained 47 participants.

4.3 Dependent Variable

The dependent variable in this research is whether the participants started the task on their intended date of completing the task. This offers a clear view of whether participants' procrastination was intended or not. If a participant chose to put off the task, he/she would receive a score of 1; if the participant did not procrastinate on the task, he/she would receive a score of 0. Putting off the task in this experiment occurred when participants replied to a pre-task email saying that they wanted to procrastinate the task (as will be discussed later). Differences were analyzed using Pearson's chi-square test.

4.4 Research Protocol

After being assigned to either the control or experimental condition, participants indicated the date on which they intend to start the task and receive the two articles: "The Free-Trade Paradox" by James Surowiecki (810 words) and "Politics as A Vocation" by Max Weber (1454 words). The title and word count of the two articles were displayed in the pre-task questionnaire for participants to estimate the aversiveness of each. Among the two articles, one is short and straight-forward, and the other is longer and more sophisticated. As will be explained subsequently, the difference in article difficulty enabled a within-subject design that examined how task aversiveness impacted participants' procrastination.

Participants were then asked to write a 250-word reflection for each article. Importantly, participants were randomly assigned to one of two groups that differ in the amount of time given to complete the task: one group was offered 7 days/1 week to complete the task, while the other had 14 days/2 weeks. As will be discussed in greater details subsequently, this random assignment enabled a between-subject design that evaluate how the length of delay impacts procrastination.

Before the task started, participants completed a brief questionnaire (see Appendix 1), regarding their email address and the date they wanted to receive each article with the deadline informed. This means that the date in which participants received each article could be different. On their intended date of starting the task, the participants received a confirmation email (see Appendix 2) at 8 a.m. (US Eastern Standard Time) asking whether they wanted to start the task on that day or whether they wanted to delay the task and start on the last day before deadline. This offered participants a chance to procrastinate. If they perceived the task to be difficult, they might be inclined to put it off (in this case, start on the last day before deadline). The email was carefully phrased so that it did not make procrastination sound unbecoming, thus reducing the possibility that participants would choose not to put off the task simply because it would create a negative impression to the researcher. Regardless of when they chose to start the task, the deadline for the reflection was 23:59 on the day they chose to start the task (US Eastern Standard Time). Therefore, the date participants intend to receive the article was also their intended completion date. Setting the deadline for reflection at 23:59 on the same day participants received

the article ensured that they would not put off their tasks again and again. Participants then replied to the confirmation email with their preferred date for receiving the article.

The influence of length of delay on intention-action correlation was evaluated using a between-subject design; two groups of participants read the same two articles but were randomly assigned to one of two completion times (one group has 7 days/1 week, the other has 14 days/2 weeks). Specifically, this difference was leveraged to examine how procrastination varied depending on the amount of time available to complete the same task. A chi-square test was used to determine whether the result was statistically significant.

The influence of task aversiveness on intention-action correlation was evaluated using a within-subject design. All participants received two articles of different difficulties, and we examined whether there was a difference in procrastinating on the easier article compared to the more difficult article (i.e., was there a difference in procrastination based on the aversiveness of the task). A chi-square test was used to determine whether the result was statistically significant.

After completing the reflections and submitting them through email, the participants received another email with a survey link attached (see Appendix 3). The survey asked participants to rate the difficulty of writing reflections for each article on a scale of 1 (very easy) to 5 (very difficult). By asking these questions, the researcher attempts to examine the validity of the task in manipulating task aversiveness, thus strengthening the validity of the results.

4.5 Research Hypotheses

Previous researches have found that when the available time of delay is longer, people tend to procrastinate more (e.g., Steel, 2007). In addition, when the task is perceived to be more difficult and stressful, participants are more likely to put it off (Steel, 2007; Blunt & Pychyl, 2000; Hermon et al., 1991). Thus, the research hypotheses are:

1. *When the time offered is longer for participants to complete the task, they will procrastinate more.*
2. *Participants will procrastinate more when writing a summary of longer and sophisticated (i.e., more aversive) article than when writing a summary for a shorter, more accessible article.*

5. Findings

5.1 Manipulation Check

Since Article 1 was selected as a less aversive article and Article 2 was intended to be Article 1's more aversive counterpart, a post-task survey asked the participants to rate the difficulty of reading each article and writing reflections on a one-to-five scale. The purpose of this survey was to confirm that participants did, indeed, perceive Article 2 to be more aversive than Article 1. As the post-task survey shows, the mean perceived aversiveness of the Article 1 (in a one-to-five scale) is 2.26. Table 1 below also illustrates that most participants rated the difficulty of reading Article 1 and writing a reflection between 1 and 3. In contrast, the mean rated difficulty of Article 2 is 3.44. The data shows that substantially more participants rated the difficulty of reading Article 2 to be 4 or 5 (17 for Article 1 versus 55 for Article 2). A two-sample-means t-test (see Table 1), found a significant difference between the perceived aversiveness of the two articles, implying that the aversiveness manipulation was successful.

Table 1. Two-sample-means t-test for perceived aversiveness of the articles

	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Standard Error</i>	<i>Variance</i>	<i>t-value</i>	<i>p-value</i>
Article 1	2.5281	1.1189	89	0.12	1.252	-4.83	0.0001
Article 2	3.4382	1.3813	89	0.15	1.908		

5.2 Primary Data Analysis

In the one-week length group, 12 out of 42, or 28.6%, participants procrastinated either in writing reflection for Article 1 or Article 2. In the two-week group, 11 out of 47, or about 23.4%, participants chose to procrastinate writing reflection for Article 1 or Article 2. Results from a chi-squared test (see Table 2) found no significant difference, indicating that the variation in the available length of delay did not affect participants' procrastination in this experiment.

Table 2. Chi-squared test (sorted by different length of delay)

	<i>Proportion</i>	<i>N</i>	<i>SE</i>	<i>p-value</i>
One-Week Group	0.286	42	—	—
Two-Weeks Group	0.234	47	—	—
Difference	0.052	—	0.093	0.581

The number of participants who procrastinated on Article 1 versus Article 2 was also recorded. For Article 1 (i.e., the less aversive article) 12 out of 89, or about 13.5%, participants procrastinated. For article 2, 21 out of 89, or about 23.6% of participants chose to procrastinate. Results from a chi-squared test (see Table 3 below), indicated that there was a marginally significant difference in procrastination between the two articles.

Table 3. Chi-squared test (sorted by different task aversiveness)

	<i>Proportion</i>	<i>N</i>	<i>SE</i>	<i>p-value</i>
Article 1	0.135	89	—	—
Article 2	0.236	89	—	—
Difference	0.101	—	0.058	0.086

6. Discussion

Based on the data collected, we found a marginally significant result that people were more likely to procrastinate on an aversive task than on its less aversive counterpart. This finding aligns with findings from previous research (e.g., Hermon et al., 1991) and contributes to the literature by using a more rigorous experimental methodology to replicate the results, strengthening the field's confidence in the validity of this finding. In a more practical sense, this research result can aid employers and teachers in understanding their employees' and students' behavior. Specifically, this finding suggests that efforts to minimize procrastination should target the aversiveness of the task rather than focusing only on individuals' self-regulatory abilities—as is often the case in scholarship on procrastination. For example, when professors or employers release tasks to their subordinates, they could make the task appear less aversive by framing the task in a way that makes it seem more engaging or less difficult.

The projection bias is one possible explanation that task aversiveness may affect procrastination. Generally, the projection bias is the misprediction of future preferences. It takes place when people exaggerate the degree to which their future condition will resemble their current conditions (Loewenstein, O'Donoghue, & Rabin, 2000). A simple example would be helpful in illustrating this concept: people with empty stomachs tend to buy too much food, exceeding their actual consumption level. According to the projection bias, people who are hungry act as if their future condition, or in this case, hunger level, will be similar to their current condition. Therefore, people are inclined to over-purchase food. In this study, when people initially notice the monetary award for finishing the task, they will feel motivated to start the task. Thus, they assume that they would also be willing to start the task on their intended day. However, when the day arrived, they did not want to start anymore, possibly due to the aversiveness of the task.

Another theory to explain this phenomenon is the present bias, which occurs when individuals place a greater value on goods achieved in the present moment, rather than receiving the same goods in the future. This is to say that when participants received the task initially, they were more eager to start the task at that moment. However, when their intended date of starting the task arrived, they became less willing to perform it compared to when they first received the task. The gradually-decreasing eagerness of starting the task, to some extent, may account for the participants' procrastination. Future research could examine these theoretical mechanisms directly in order to further advance the field's understanding of procrastination.

One limitation to be acknowledged in this research is that it only examined one aspect of task aversiveness: the perceived difficulty and stressfulness of the task. The experiment was designed only to make one task perceived to be more difficult and stressful than the other — since the difficulty level of task is often salient in working and academic environments. There are other aspects of aversiveness that are not included in the experiment design, such as whether a task induces fear. For example, would people tend to put off seeing the doctor when fearful of the possibility of themselves being diagnosed with cancer? Further research should examine whether different aspects of task aversiveness (e.g. being fear-inducing) also impacts individuals' procrastination.

While task aversiveness appears to be a strong predictor for procrastination, length of delay did not have a strong effect on the result in this experiment. The finding contradicts scholars (e.g., Steel, 2007) who hypothesize that

people would use the nearness of the task to predict the length of delay before completing it.

There are several possible reasons why no effect was found for the length of delay. First, the sample size may have been too small to detect an effect. If future research employs a larger participant pool, the result may be different. Another possibility is that the discrepancy between the two length of delay conditions is too small for the participants to react differently. Future research can make the difference more obvious, such as setting one deadline as a week and another as a month or even longer. In so far as this experiment is concerned, it is sufficient to say that length of delay did not affect procrastination when the deadline is less than or equal to two weeks from the current time.

The characteristic of the task itself is an important contributor to procrastination, but another factor not considered in the experiment is the participants' personality. A large body of research has revealed a relationship between procrastination and different aspects of personality, such as conformity, socially prescribed impulse control, achievement orientation, cautiousness, morality, organization, thoroughness, and reliability (Costa, McCrae, & Dye, 1991; Goldberg, 1993; Hogan & Ones, 1997; Steel, 2007). This raises the possibility that the effects found on length of delay or task aversiveness could be stronger for certain types of personalities. Future research that integrates personality factors with characteristics of task would build upon this study's findings and offer further guidance for how to reduce procrastination.

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Appendix

Appendix 1

Questionnaire 1

Thank you for being a part of this research!

The task is to read 2 articles send by the researcher later to your email, then write a 250 words reflection for each of them. For each article, you will have to complete the reflection on the SAME DAY you receive it. However, you can choose the date in which you receive each article anytime within the next 7 days/1 week starting at 00:00, 8.3 US Eastern Standard Time (the final deadline will be at 23:59, 8.10 US Eastern Standard Time). We will ask you to report the dates you want to receive each article. But when these dates come, you can change your mind. On your intended day of starting each reflection, you will receive a confirmation email at 8 a.m. (US Eastern Standard Time) to check whether you want to read the article and write reflection on that day. If you choose not to read the article on that day, you will get the article on the 7TH DAY instead. Please reply before 11:00 (US Eastern Standard Time). We will send you the article at 11:00. We are giving you the option to choose the date to ensure you are free when completing the task. It's fine if you want to write the reflection on the 10th day. But please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time). For instance, if you select 8.5 (2 days after) below for both of your articles, you will get 2 separate emails for each article 2 days from now. You will have the choice to do both articles on that day, or both articles on the 7th day, or one article on that day and one article on the 10th day.

Before starting the task, you are required to complete the questionnaire below.

1. Please enter your email address.
2. Please indicate below the date you wish to receive this article: The Free-Trade Paradox by James Surowiecki (810 words)
3. Please indicate below the date you wish to receive this article: Politics as A Vocation by Max Weber (1454 words)

Questionnaire 2

Thank you for being a part of this research!

The task is to read 2 articles send by the researcher later to your email, then write a 250 words reflection for each of them. For each article, you will have to complete the reflection on the SAME DAY you receive it. However, you can choose the date in which you receive each article anytime within the next 14 days/2 weeks starting at 00:00, 8.2 US Eastern Standard Time (the final deadline will be at 23:59, 8.16 US Eastern Standard Time). We will ask you to report the dates you want to receive each article. But when these dates come, you can change your mind. On your intended day of starting each reflection, you will receive a confirmation email at 8 a.m. (US Eastern Standard Time) to check whether you want to read the article and write reflection on that day. If you choose not to read the article on that day, you will get the article on the 10TH DAY instead. Please reply before 11:00 (US Eastern Standard Time). We will send you the article at 11:00. We are giving you the option to choose the date to ensure you are free when completing the task. It's fine if you want to write the reflection on the 10th day. But please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time). For instance, if you select 8.4 (2 days after) below for both of your articles, you will get 2 separate emails for each article 2 days from now. You will have the choice to do both articles on that day, or both articles on the 10th day, or one article on that day and one article on the 10th day.

Before starting the task, you are required to complete the questionnaire below.

1. Please enter your email address.
2. Please indicate below the date you wish to receive this article: The Free-Trade Paradox by James Surowiecki (810 words)
3. Please indicate below the date you wish to receive this article: Politics as A Vocation by Max Weber (1454 words)

Appendix 2

Confirmation Email 1

Dear participant:

Thank you for being part of this research!

This email is to confirm whether you want to start reading the article: **The Free-Trade Paradox** today. You can choose to start the task today or on 8/12/2019 US Eastern Standard Time (last day before deadline), just in case you are not free today. Please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time).

Please reply to this email which day you want to start the task.

Confirmation Email 2

Dear participant:

Thank you for being part of this research!

This email is to confirm whether you want to start reading the article: **Politics as A Vocation** today. You can choose to start the task today or on 8/12/2019 US Eastern Standard Time (last day before deadline), just in case you are not free today. Please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time).

Please reply to this email which day you want to start the task.

Confirmation Email 3

Dear participant:

Thank you for being part of this research!

This email is to confirm whether you want to start reading the article: **The Free-Trade Paradox** today. You can choose to start the task today or on 8/16/2019 (US Eastern Standard Time), just in case you are not free today. Please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time).

Please reply to this email which day you want to start the task.

Confirmation Email 4

Dear participant:

Thank you for being part of this research!

This email is to confirm whether you want to start reading the article: **Politics as A Vocation** today. You can choose to start the task today or on 8/16/2019 (US Eastern Standard Time), just in case you are not free today. Please keep in mind, whenever you decide to start the task, the deadline is at 23:59 on the SAME DAY (US Eastern Standard Time).

Please reply to this email which day you want to start the task.

Appendix 3

Survey Email

Congratulations! You have completed both of the reflections on time. We really appreciate your hard work and thank you again for being part of this research.

The last step is to complete this survey. The link is attached below.

<https://jingfeihuang.typeform.com/to/EbYqbV>

It shouldn't take more than 2 minutes.

You will get your payment after the whole task is finished, i.e. after 8/16/2019 through JobBoy. Thank you for your patience!

Survey Content:

1. From 1 (very easy) to 5 (very difficult), how would you rate the difficulty of writing reflection for the article The Free-Trade Paradox?
2. From 1 (very easy) to 5 (very difficult), how would you rate the difficulty of writing reflection for the article Politics as A Vocation?
3. Why didn't you choose to complete the reflection on the alternative date (e.g. if you choose to complete the reflection on 8.3, why didn't you choose the other option: 8.16/the day before deadline)?

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