

# How to minimize procrastination.

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## ABSTRACT

Procrastination is a barrier to achieving personal goals. This project sought to test the effectiveness of implementation intentions (plan for a time and location connected to an action), purposeful delay (delaying tasks to increase motivation), and intrinsic reasons (behavior that is driven by personal internal rewards) on procrastination. Our research consisted of two 2-week studies on ourselves: a non-experimental study examining the correlations between natural variations in the variables described above and an experimental study specifically testing the effect that implementation intentions has upon procrastination. Our correlational results supported the work of these previous studies by showing the ability to predict the degree of procrastination based on the amount of implantation intentions and intrinsic reasons that naturally occurred, with implementation intentions having the highest correlation with procrastination. However, our experimental results did not support a causal role of implementation intentions in minimizing procrastination. It is speculated that these results occurred because of the increased number of times implementation intentions were used and procrastination was measured and due to influences from external events during trials.

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## 1. Introduction

Procrastination is problematic for students, who are constantly required to attain a high level of academic progress, and also for those in the workplace and home. This barrier has led to much research on methods of minimizing procrastination. Within our own research, we sought to examine the effectiveness of three possible solutions to minimizing procrastination, with our hypotheses derived from the results of three previous studies.

Our first hypothesis was based on a study by Owens et al. (2008) which surveyed 152 randomly sampled university students. This study found that students who form

implementation intentions (plan a time and location connected to an action) are greater than 40% more likely to act upon their plan regardless of participants’ self-rated scale of high or low procrastination. From these results, we hypothesized that implementation intentions would minimize procrastination.

Our second hypothesis was based on a study by Pincten et al. (2019) which surveyed 1605 first-year science and engineering students from a university in Flanders, Belgium over a one-year period. This study found that delaying tasks to increase motivation (known as purposeful delay) does not help students meet deadlines. From these results, we

hypothesized that intentionally delaying tasks to would not aid in academic success.

Our third hypothesis was based on a study by Senécal et al. (1995) which surveyed 498 French-Canadian students from a junior college in the Montreal area. This study found that having amotivation (no a sense of purpose or expectation of reward) and external regulation (behaviour controlled by rewards or imposed by others) self-regulation styles are each positively associated with procrastination while having an intrinsic regulation (behavior that is driven by personal internal rewards) self-regulation style is remarkably negatively associated with procrastination in everyday life. From these results, we hypothesized that procrastination can be minimized by pursuing intrinsic reasons for completing tasks.

The present research undertook to discover which of these three hypotheses was most strongly supported in a within-subjects correlational study and then to further test that hypothesis in a double-blind experimental study in order to examine if a causal relationship exists.

## **2. Methods**

### *2.1 Participants*

The authors were the only participants in this study. Both were first-year students at Camosun College (Victoria, B.C., Canada) pursuing an Associate of Arts Degree in Psychology before transferring for further study at the University of Victoria. Both participants were engaged in full-time study (without additional part-time employment) during the duration of this study.

### *2.2 Materials and Procedure*

#### *2.2.1 Correlational Study Methods*

We operationally defined the outcome variable, procrastination, as time spent on trivial tasks (postponing, hesitating, distracting, or wasted time), as opposed to time spent on needed tasks (work, play, rest). The daily amount of self-declared procrastination was measured on a procrastination scale of 1-10: 1) Less than 10 minutes; 2) 10-19 minutes; 3) 20-29 minutes; 4) 30-39 minutes; 5) 40-49 minutes; 6) 50-59 minutes; 7) 60-69 minutes; 8) 70-79 minutes; 9) 80-89 minutes; and 10) more than 90 minutes.

The degree of each predictor variable was quantitatively scored in ourselves by the daily measure of the number of times it occurred. We operationally defined an implementation intention as deciding a time and location in which you will begin a task. We operationally defined purposeful delay/active procrastination as intentionally delaying a task to increase motivation to complete it (increased pressure by doing a preferred task first). Finally, we operationally defined intrinsic reasons as behavior that is driven by personal internal rewards, and included for this the use of personal reward (of play or rest) to motivate us to begin tasks.

#### *2.2.2 Experimental Study Methods*

We conducted our experimental research over a two-week period including six experimental days and six control days. On experimental days, at the start of the day (or prior to any study), we set aside a fifteen-minute period to create implementation intentions (a plan for time and location connected to an action) for each required task for that day (with a minimum requirement of two tasks per experimental day). Implementation intentions related to required class periods were not to be observed as part of our experimental

research for this project. On control days, no implementation intentions were created.

As a counterbalancing procedure to reduce the possibility of order effects, we conducted our experiment through random assignment. This was done by giving each participant a set of twelve playing cards (six red, six black). At the beginning of each day, participants drew one card from the shuffled deck. Red cards initiated an experimental day and black cards initiated a control day.

Results for this study were inputted daily through an online diary over a fourteen-day period respectively for both the correlational study and the experimental study.

### 3. Results

#### 3.1 Correlational Study Results

As seen in Table 1, both implementation intentions and intrinsic reasons were found to be statistically significant. In our pooled raw data, we found intrinsic reasons to be the best predictor of procrastination ( $r = -0.60, p < 0.001$ ), where greater amounts of the intrinsic reasons predicted less procrastination. However, within our pooled standardized data, implementation intentions was the better predictor of procrastination ( $r = -0.50, p < 0.007$ ; see Figure 1) and the correlation between intrinsic reasons and

procrastination, although still statistically significant, was just slightly less ( $r = -0.45, p < 0.016$ ). As predicted within our original hypothesis, purposeful delay did not have statistical significance in minimizing procrastination within our pooled standardized data ( $r = -0.12, p < 0.567$ ).

#### 3.2 Experimental Study Results

Due to the strong correlation we found between implementation intentions and procrastination, we conducted a further experimental study to test whether a causal relationship exists between these two variables. However, as shown in Figure 2 and Table 2, our experimental results found no statistically significant effect of implementation intentions upon procrastination ( $t = 1.52, p < 0.143$ ).

### 4. Discussion

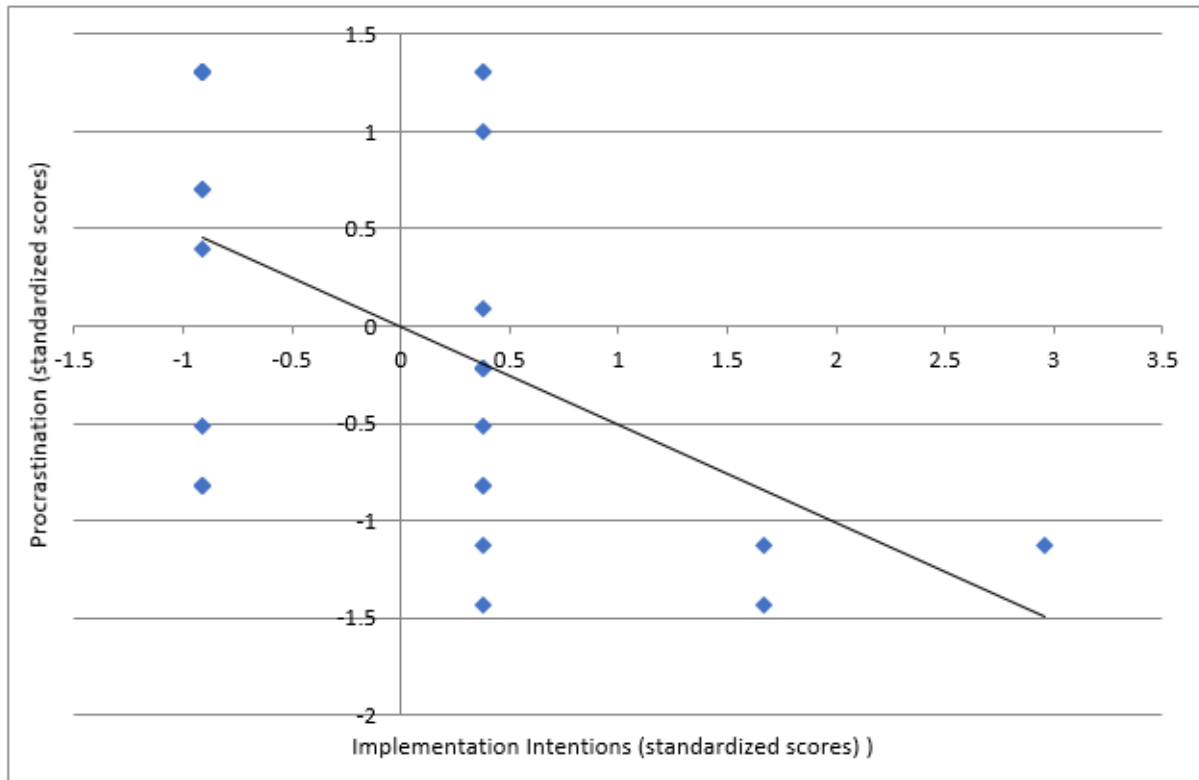
Due to the results of our experimental study, we found no significant support for our hypothesis that implementation intentions (having a plan for time and location connected to an action) minimize procrastination. Although our correlational study found the use of implementation intentions and intrinsic reasons negatively correlated with procrastination levels, our experimental study found no support for the

*Table 1. Correlation coefficient (r) values, with number of trials (n) per correlation in brackets.*

Hypothesis examined	Subject #1	Subject #2	Pooled raw data	Pooled standardized data
Implementation Intentions & Measure of Procrastination	-0.37(13)*	-0.62(14)	-0.50(27)*	-0.50*
Purposeful Delay & Measure of Procrastination	0.45(13)	-0.47(14)	-0.12(27)	-0.12
Intrinsic Reasons & Measure of Procrastination	-0.52(13)*	-0.90(14)*	-0.60(27)*	-0.45*

\* $p < 0.05$ .

Figure 1. Scatterplot of implementation intentions and procrastination using pooled standardized data.



use of implementation intentions for this purpose.

One possible explanation for the discrepancy seen between the lack of significant results for implementation intentions in our experimental study and the significant results reported by previous experimental studies could be in the number of times implementation intentions were

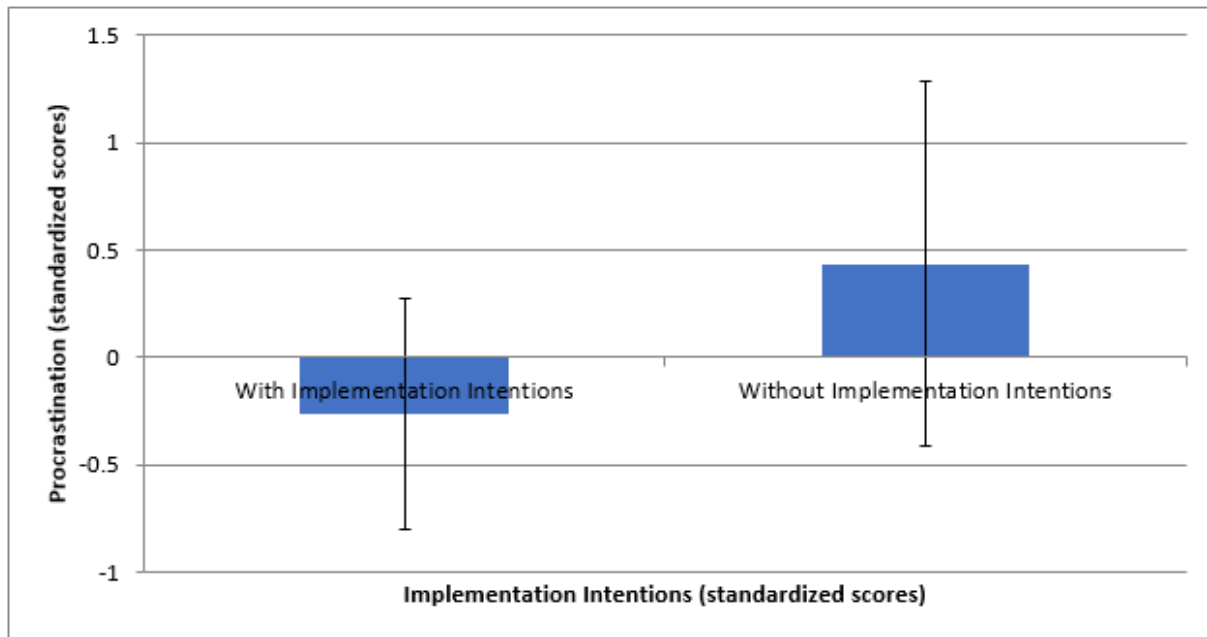
used and procrastination was measured. For example, Owens et al (2008) only measured one time in each participant the ability to keep to an appointment when using implementation intentions. In contrast, our participants used as many as four implementation intentions in the same location (but with different times) consecutively. For this reason, although the

Table 2. Descriptive statistics on procrastination for implementation intention conditions.

Condition name	Statistic	Subject #1	Subject #2	Pooled raw data	Pooled standardized data
Red Cards	Mean	3.16*	6.66	4.9	-0.26
	S.D.	0.75	1.50	2.15	0.84
	N.	6	6	12	12
Black Cards	Mean	4.3	8.16	6.25	0.43
	S.D.	0.81	2.78	2.80	1.33
	N.	6	6	12	12

\* $p < 0.05$  Statistically significant difference from control condition.

**Figure 2.** Bar graph of average ( $\pm$  95% C.I.) procrastination across implementation intentions conditions using pooled standardized data.



implementation intentions may be effective in beginning a task (to keep an appointment), they do not appear to minimize procrastination that may have occurred between or during multiple consecutive tasks. This effect could also have been affected by how our study measured levels of procrastination for multiple assignments at the end of the day, whereas Owens et al, only focused on one assignment at a time. To test this, future studies could examine whether implementation intentions are not effective when used consecutively in one location (with different times).

Slight individual discrepancies could be seen between the experimental results of the two participants in the current study. While Subject #1's results attained statistical significance ( $p < 0.028$ ), Subject #2's results did not ( $p < 0.273$ ), and when pooled together our results were no longer statistically significant ( $p < 0.204$ ). Upon closer inspection of these results, we noted that Subject #2 had a procrastination score

of 3 (20-29 minutes) on one control day which caused these results to no longer have statistical significance. When reviewing why this was the case, Subject #2 reported that he had so many assigned tasks for that day that he had "no time left to procrastinate." Thus on that trial it appears that alternative reasons (pressure, intrinsic, or otherwise) required him to complete tasks with minimum procrastination regardless of the use of implementations. To avoid this possible source of error, future studies could better control the influences of external events during trials.

In conclusion, although our correlational results supported and inverse relationship of procrastination with both implementation intentions and intrinsic reasons, our failure to obtain statistically significant results in our experimental study limits our ability to draw any causal conclusions about the use of implementation intentions to minimize procrastination.

## References

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