

# Unpacking Planning Fallacy

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## Abstract

This study was conducted to determine whether planning fallacy can be affected through the action of unpacking a to-do list. The study uses two surveys on a specific population of Amazon Turk workers and randomly assigned participants to each of the two surveys. The survey produced discrete responses that can be used to statistically determine the effect of unpacking on the effect of planning fallacy. The data were collected and analyzed through data analysis tools and the statistical concept of T-Test. Although the manipulation of unpacking a to-do list was evidently present in the experimental group, the results failed to prove the initial hypothesis that unpacking a to-do list reduces the effect of planning fallacy.

**Keywords:** planning fallacy, unpack, optimism bias, support theory

## 1. Introduction

For most people, there is a very common and relatable occurrences every single day. This challenge, although seemingly unimportant, can have significant impact on people's lives. The mental challenge of procrastination affects daily work, studies, and relaxation. Procrastination can be described as delaying the completion of a certain action, instead trusting oneself to complete it later, even if the task becomes harder through delays. Procrastination is a very natural occurrence, and it is often experienced by students who struggle to turn in an assignment on time because they have procrastinated in starting the assignment. As a high school student, I am no different from others. Procrastination is a continuous problem that I experience on a near-nightly basis, and since I attend a boarding school, the challenge of procrastination is more important than ever before. To prevent procrastination, I personally devised a strategy of creating a daily to-do list. There were, however, two major problems with the to-do list that rendered it an ineffective solution to procrastination.

The general problem of an ineffective to-do list that I experienced was that I sometimes struggled to muster the willingness to make a to-do list and, ironically, ended up procrastinating the task. In other words, I experienced procrastination tendencies while attempting an action designed to prevent procrastination. This problem, however, was overcome when I made my to-do list creation mandatory by designating others to hold me accountable for creating them every day. The larger problem with creating a to-do list is that they are usually inaccurate and often incomplete. Overtime, the effectiveness of a to-do list begins to diminish, as they are rarely complete and thus lack significance. This causes to-do lists to lose their purpose of promoting efficiency, instead becoming a burden that tends to be delayed. This delay often happens not only because the tasks on the to-do list might be boring, but also because the creator of the list may feel overly confident in their efficiency, thus creating a large and complex list that they are unable to complete.

To address the problems of ineffective to-do lists, I researched the topic of planning fallacy, the leading cause of why to-do lists can be inefficient. The research conducted in this study will determine whether planning fallacy can be eliminated or reduced in the process of making a to-do list through the usage of unpacking a to do list or listing the details about each aspect of the to-do list. By analyzing the effect on unpacking to-do list on whether experimental subjects actually complete their respective to-do lists better, the study will determine the effectiveness of using unpacking as a method of increasing learning efficiency through improving the effectiveness of to-do lists.

## 2. Research Background

### 2.1 Planning Fallacy

To study more efficient, a to-do list is a common strategy that people use. However, when it comes to-do lists, people often struggle with producing practical lists that they will actually be able to complete. In most cases, people overestimate their abilities to complete tasks and produce difficult to-do list that they cannot complete, defeating the purpose of to-do lists. The psychological concept that causes the phenomenon is called planning fallacy. Planning fallacy is a common misconception that causes people to underestimate the amount of time and effort a task entail (Buehler, Griffin, & Ross, 1994). Therefore, people always tend to overestimate their abilities in completing tasks, and thus creating plans that would be difficult to complete. Usually, the overestimation occurs despite the knowledge of the duration of the task from previous experiences. However, because planning fallacy has a strong relation to optimism bias (Buehler, Griffin, & Ross, 2002), in which people usually predict the better outcome, people discredit the previous belief they have about a task and thus underestimates their completion time. People tend to ignore their previous experiences of similar tasks and persist to prioritize. For example, if an investor were to predict whether their stock profile's value is to increase or decrease. Despite recognizing a historical pattern of the stock's growth trend, which would be that the stock decrease in value, they would tend to predict the growth rather than the pessimistic outcome, decrease. Evidently, when making predictions about one's own ability, we have the strong tendencies to overestimate. The factor of optimism bias that seems to undermine a person's ability to predict different situations contributes to the increased effect of planning fallacy by directly causing the creation of inaccurate to-do lists that is not practical. In this research, the assumption is that the participants are naturally influenced by optimism bias and that they will overestimate their ability to complete tasks. Because their estimations are overestimated, they will create to-do list with too many items that they cannot complete.

There are different studies conducted in the purpose of eliminating planning fallacy (Krueger & Evans, 2004). One of the solutions proposed by researchers is the assumption of the worst-case scenario for the entirety of a plan. In other words, creating the recognition of all the worst possible outcomes of all the events in a plan, the overconfidence of the planner should be eliminated. However, following several studies, including the one conducted by Griffin & Buehler, this internal manipulation does not reduce the effect of planning fallacy.

### 2.2 Unpacking

According to a study by Justin Kruger and Matt Evans, unpacking is the most effective solution to prevent planning fallacy from affecting one's learning capabilities. The concept of unpacking is revolved around increasing the complexity of something by revealing more details about it. In the situation of studying, unpacking is helpful in creating an accurate to-do list. When making a to-do list, one usually considers all tasks that have very recent due dates and begin to list them to complete for the day, usually in the order of the most important and emergent to the least. However, in this process, which is the common process, people do not consider to specific process and amount that they must complete, therefore not giving an accurate estimation of time that the task will take. To unpack a to-do list, the person will have to list the specific process of completing each item on the list. The idea behind unpacking is that by listing on the specific steps, a person will understand the practicality of the to-do list by having an accurate reference to estimate the duration of each task. In an experiment targeted towards how unpacking reduces planning fallacy (Kruger & Evans, 2004), participants were divided in two groups and given the same task of creating a Christmas shopping list. The unpack group, however, were not only asked to estimate the time it will take for them to do their shopping, but also to write down the specific recipients of the gifts and details about the gifts. The results demonstrated that on average, the participants in the unpack condition estimated significantly longer time in their gift shopping, which is a recognition of the overestimation of their ability to complete a task. In the case of this study, the people who make to-do lists are less prone to the overconfidence of being able to complete more task than what they are capable of if they were to list the details about the tasks they will complete.

### 2.3 Support Theory

A key concept produced by the action of unpacking; the Support Theory suggests that the probability of making an accurate prediction is increased by increase of supporting evidence. (Rottenstreich & Tversky, 1997) In the application of this specific study, the Support Theory will be fully implemented as the study aims to determine whether unpacking will increase the probability of creating an accurate to-do list that would have higher chance of completion. Basically, the action of unpacking is the process of gathering evidence for the brain to decide how long would a specific task take. Thus, the more thorough the unpack is, the more evidence, or support, the brain would have when assessing a duration to a task.

### 3. Methodology & Experiment

To determine whether planning fallacy can be resolved by the application of unpacking, two surveys are conducted on more than 200 people through Amazon Mechanical Turk. Mechanical Turk is an Amazon program that pays people to complete surveys at the expense of researchers. This study was made possible through the usage of the Mechanical Turk platform, which reached out to the Mechanical Turk workers who have monetary incentives to participate in the study.

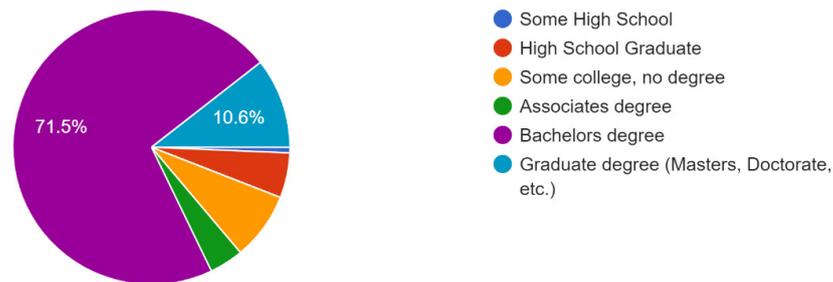
#### 3.1 Sample Selection (Population)

The population to be sampled from in the study is Mechanical Turk workers, which can vary in demographics and age. Therefore, a large sample size is required and random selection into two groups is necessary. To produce two response groups that have similar demographics and age, the study assigns all the participants with odd birth month to one group and the others to the other group, thus achieving random selection by not selecting group based on factors that can affect the outcome of the experiment.

After the survey, the demographic questions demonstrated that the people in both survey groups were similar in age and their education level, which meant that they would have similar tasks they would complete because they have strong similarities with each other. The control group’s population could be summarized by the following two graphs:

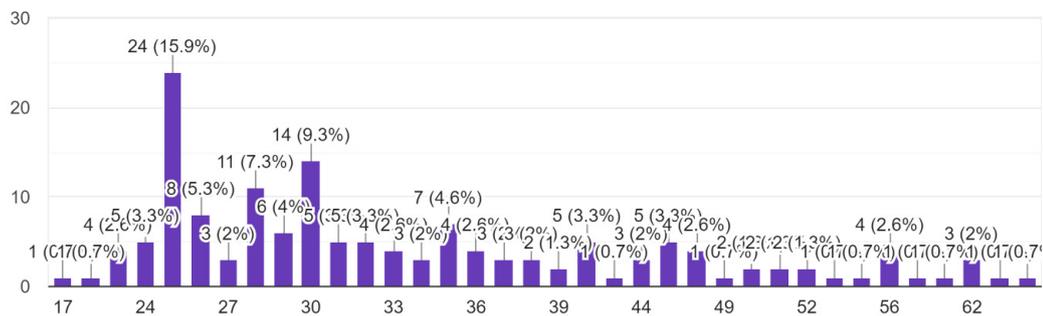
Which of the following best describes your highest achieved education level?

151 responses



How old are you?

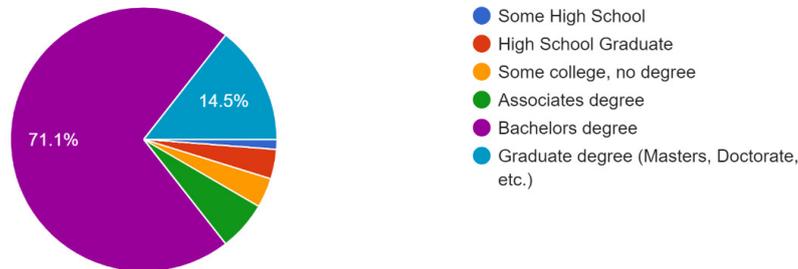
151 responses



And the demographics of the experimental group could be summarized in the following graphs:

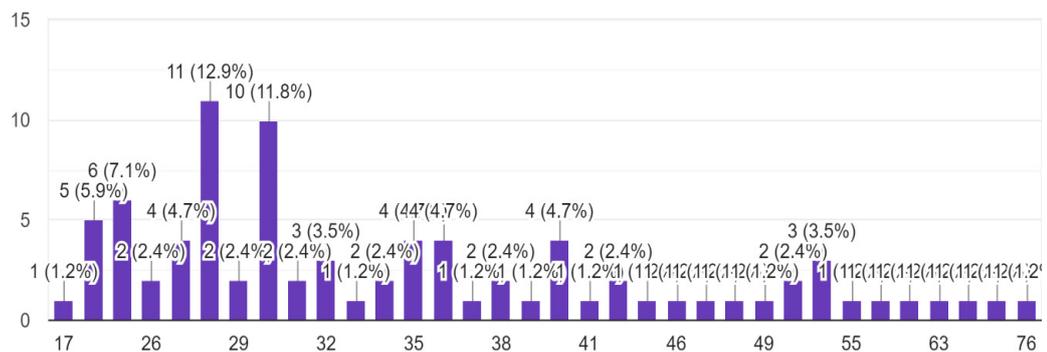
Which of the following best describes your highest achieved education level?

83 responses



How old are you?

85 responses



As depicted by the graphs, the participants in both groups are around 71% bachelors, which meant that they have similar education level. In term of age, both groups had majority of participants within the age range of 20-30 years old, which meant that they would be in similar stages of their respective career.

### 3.2 Survey Questions

There are two surveys, one for the control group, which does not require the participants to unpack their to-do list, and one for the experiment group, which requires the unpacking. Both surveys contained the same questions regarding the demographics of the participants. However, the two surveys differed in the main section which both involved participants to create to-do lists for themselves.

- Survey 1 (Control)
  - 1) In the provided space, please create a to-do list that you will complete for the next 24 hours.
  - 2) How many items on the list do you estimate that you will complete?
- Survey 2 (Experiment)
  - 1) In the provided space, please create a to-do list that you will complete for the next 24 hours AND provide the necessary process and requirements in completing each item.
  - 2) How many items on the list do you estimate that you will complete?

For both sections, the participants were asked to create their list or the unpacked list in a paragraph answer section below, in which all participants completed. The expected number of participants in this study to make it valid was at least 200 participants, and the study in total was able to gain 253 responses. At the end of the

surveys, there is one final question that asks the participants to respond whether the surveying process proceeded in order. The participants had the choice to discredit their response by answering “no”. Therefore, a portion of the responses became null results and were not considered for analysis. The survey also returned results that demonstrated around 60% of the participants in both groups have participated in similar studies before. Therefore, they are familiar with the process of the study. However, there could be a possibility that the participants recognized the factor of unpacking, which was a mental manipulation. So, some participants in the control survey may have acknowledged the fact that unpack was a variable in the experiment and that may have influenced their responses.

### 3.3 Procedure of Surveying

The survey was published to all Amazon Mechanical Turk workers. Any participants willing to take the survey would be taken to the page which includes links to both surveys. Clear instruction on the top of the page will instruct the participants with odd birth months to complete the control survey while the other participants will be assigned to complete the unpack survey. The survey received sufficient responses within 24 hours and the data were downloaded and formatted using Excel and Jamovi, which were also used to conduct statistical analysis.

## 4. Results & Analysis

### 4.1 T-Test of Control vs. Experiment

Independent Samples T-Test						
Independent Samples T-Test						
		Statistic	df	p		Effect Size
How many items on the list do you estimate to complete?	Student's t	-1.45 <sup>a</sup>	231	0.148	Cohen's d	-0.200
<sup>a</sup> Levene's test is significant ( $p < .05$ ), suggesting a violation of the assumption of equal variances						
Group Descriptives						
	Group	N	Mean	Median	SD	SE
How many items on the list do you estimate to complete?	control	152	5.43	4.50	4.43	0.359
	unpack	81	6.41	5.00	5.69	0.633

Considering the required statistical conditions for conducting the t-test of comparing two sample means, in which all were met in this study:

- 1) The surveys selected two independent random samples for the control and the unpack group
- 2) The sample distribution of both groups was approximately normally distributed.
- 3) It is reasonable to assume that the population for either groups were at least 10 times more than the sample sizes.

As demonstrated by the bottom part of the result analysis of both surveys, the average, or mean value of the estimation of items completed shows that the participants that unpacked their to-do list estimated they were able to complete more items than the participants who did not unpack. The data analysis depicts that the control group produced a mean value of 5.43 items while the unpack group produced a mean value of 6.41 items. This means that on average, unpacking participants estimated themselves to complete one more item than the participants in the control group. In simple analysis, this comparison demonstrates that unpacking was not effective in lowering the estimation of participants in their to-do list, which is contradictory to the study's early hypothesis in that unpacking would cause participants to lower their estimation of the completion of their to-do lists.

Evidently, the data demonstrates that the null hypothesis has not been disproved because its p-value of 0.148 exceeds the 0.05 significance level. This meant that the null hypothesis that there is no significant difference between the population mean of number of items estimated to be completed for control and unpack group should not be rejected. Therefore, not statistical inferences can be made from this set of data.

4.2 T-Test of Control vs. Experiment (No Null Results)

**Independent Samples T-Test**

Independent Samples T-Test						
		Statistic	df	p	Effect Size	
How many items on the list do you estimate to complete?	Student's t	-0.980	138	0.329	Cohen's d	-0.176

Group Descriptives						
	Group	N	Mean	Median	SD	SE
How many items on the list do you estimate to complete?	control	94	4.91	4.00	4.31	0.444
	unpack	46	5.74	4.00	5.36	0.790

As mentioned earlier, the study included data that participants considered to be null. By filtering through the valid data and removing the null responses, the T-Test was performed again. The mean estimation value is still higher for the unpack group at 5.74, compared to the control group of 4.91. Additionally, the p-value is 0.329, which is well above the 0.05 significance level, the standard acceptable limit to reject the null hypothesis that there is a difference in the population mean of control group and unpack group. Evidently, the results show that unpacking did not significantly reduce planning fallacy.

**Independent Samples T-Test**

Independent Samples T-Test						
		Statistic	df	p	Effect Size	
response length	Student's t	-2.59 <sup>a</sup>	141	0.011	Cohen's d	-0.456

<sup>a</sup> Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances

Group Descriptives						
	Group	N	Mean	Median	SD	SE
response length	control	94	67.8	53.5	65.4	6.75
	unpack	49	114	74.0	146	20.8

To determine whether unpacking was implemented in the experiment, the response length is recorded from both surveys and compared. As depicted by the table above, the mean response length for the control group is 67.8 and the response time for the experimental group was 114. The unpack group's participants gave responses nearly twice if the control group, which meant that they unpacked their to-do lists in detail. Given that the only difference between the two sections occurred in variable section, it is evident that the survey prompted participants to unpack their to-do list, taking more time in their responses.

**5. Value Added**

This study was conducted to investigate into methods that can be utilized to improve the efficiency of learning and working. Because to-do list is one of the most important aspects of productivity, the research conducted in the study analyzes how it can be improved, thus making developments in better learning, and working. Although the statistical results demonstrated that unpacking was an ineffective method in reducing planning fallacy, the cause of ineffectiveness in to-do lists, the research demonstrates that simply unpacking a to-do lists with details will not significantly increase the effectiveness of to-do lists and productivity. Instead, the study suggests that

further research is necessary in deeper development in which methods are effective in reducing planning fallacy and what can be done in addition to simply unpacking to-do lists to increase one's productivity.

## 6. Conclusion

The most important question raised from the study was despite previous research regarding the topic of unpacking vs. planning fallacy, this study produced results that failed to support the hypothesis. There could be several outside factors to be considered in the study, including when the survey was taken, where did the participants complete the survey, etc. There could also be a more accurate interpretation of the collected data that represented the effect of planning fallacy better. The concept that the participants underestimated their abilities to complete their to-do list without mentally unpacking the lists is possible. However, because the study rested on the common assumption that a more accurate prediction of one's ability to complete a list is usually lower when the details are unpacked, the underestimation assumption was ignored in this study. In the future, the study will first expand by directly discovering an accurate and discrete method to represent the effect of planning fallacy.

I believe that the reason why my results were different from the expectations because of the central question that was manipulated to incorporate the unpacking factor. The participants obviously have different to-do lists suitable for themselves and they categorized them in their own personal manner. I believed that if the study instructed the participants to complete a common task, such as the Christmas shopping example from Kruger & Evans 2004 study, the effect of unpack on planning fallacy could be much more perceivable and statistically proven.

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