

## Waiting until the last minute

*People often do things at the last minute (students turning in papers, professors grading exams, and so on).*

*a) Ask yourself why the observation might be true and write down your explanations.*

People doing things at the last minute is an unfortunately familiar feeling of many, and is often the result of having procrastinated doing work. While it is difficult to conclusively say whether or not this is true because of lack of empirical data, it is possible to speculate why this *might* be true. A possible explanation is that people might put off work which is considered to be unenjoyable, putting minimum time on it and doing the task only when absolutely necessary (i.e right before a deadline). Another possible explanation is that indecisiveness and anxiety dealing with not knowing how to proceed with a task causes one to procrastinate and wait till the last minute. Being easily distracted is also a possible reason, with those who have attention issues often facing procrastination and the inevitable last minute work which follows.

*b) Generalize the explanatory model – that is, induce the most general, abstract model you can produce that still has the original observation as a consequence.*

Let us use idea that the reason someone finishes a task in the last minute is because they consider the task unenjoyable. This would mean that the more unenjoyable a task is perceived, the more it is likely that the task will be submitted in the last minute. There are some factors which also effect the likeliness of this, such as whether the person is likely to be distracted, and on how important the task is, and if there are other more enjoyable tasks to be completed. We can then attempt to say that higher ability to be distracted increases the odds of one not finishing a task, that the presence of more enjoyable other tasks will increase the odds of not finishing a particular task, and that we will procrastinate less important tasks - here we can also say that a task becomes more important as its deadline approaches. Mathematically we can attempt to describe the model by saying:

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log-odds('last minute') ~ distracted +  
sum(enjoyability_other_tasks) - importance_task_received
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It is important to note that the importance of tasks change over time, and we only consider the importance of the task at the moment of starting *thinking* of the task, or at the moment the task is received.

*c) Induce an alternative model that also has the original observation as a consequence.*

While our previous explanation focused on the enjoyability of other tasks and the perceived importance of the task, we will now attempt to see if it is possible to explain work being done last minute by how difficult it is to *start* the task. If a task is more difficult to start, it is likely to be turned in at the last minute. We will still use the 'distractibility' of a person in this model as well. If a task is difficult to perform, it will be more difficult to start, and if the person is indecisive, it is also likely they will start the task later rather than sooner. Similar to our previous model, let us describe it in terms of the probability of starting the task late:

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log-odds('last minute') ~ distracted + difficulty +  
indecisiveness
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Here the relationship is positive, with an increase in any of the perceived qualities leading to an increase in the odds of it being submitted late.

*d) For each of the two general models produced in (b) and (c), derive two interesting predictions (four predictions in total). Be sure the logical connection between your model and your predictions is explicitly stated and that any assumed facts concerning the world are made explicit.*

Our first model focused on the pleasure principle and on the idea that humans will tend to first perform tasks that they enjoy before moving on to tasks they don't enjoy, and only completing them in the last minute. This can well explain why a teacher or teaching assistant might not submit grades on time - correcting multiple answer sets, especially when the answers are quite subjective, can be a draining experience. While it might not be very difficult to do, there are still more enjoyable other tasks to compete, or even maybe slightly less enjoyable but more important tasks to do. Combining these factors, our model suggests that it is highly likely that a teacher or TA does not submit grades on time. However, the importance of a task might effect this; we are more likely to delay tasks which are not very important, and it is now things may end up flying under the radar. We procrastinate the task until the very last minute until it *becomes* important, after which it is already likely going to be submitted in the last minute.

Our second model can explain the other side - why a student may be likely to submit as assignment late. For example, at the University of Chicago, a student in the perspectives class may not have any prior experience in the computational sciences. This means that just the *start* of the process of submitting an assignment can be a daunting task. What exactly is Git? Why does *checkout* mean so many things? What is a Jupyter notebook and how is it related to python, and what does markdown even mean? Not knowing where to even start will mean that students may be stressed out and put off actually starting the work. Indecisiveness also starts playing a part here - do I use python or R to attempt the project? "Maybe I should do a full literature review and the pros and cons of each tool before starting!"

Putting off actually starting by postponing important decisions related to the tasks is a possible effect of indecisiveness. Any kind of easily distractible behaviour will make this kind of behaviour worse. Apart from students who are new to a certain kind of research or toolkit, this model can also predict that this behaviour is likely to translate to putting off social commitments till the last minute. Imagine the situation of having to choose between giving an extra ticket to a significant other/partner, and a best friend. It is a difficult task and one that is likely to have a lot of hesitation and indecisiveness - there is chance that one might leave such a decision for the last minute, and is a phenomenon people face when having to deal with awkward social situations having to choose between two good or two bad choices.