CSC 595 - Research Skills

Motivation and Procrastination

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Motivation matters

- Master's 2 years (sometimes a bit longer)
- PhD 5 years (but probably another year or so)
- A significant chunk of your life, with its ups and downs
- Times of creative frenzies, and lots of times with low excitement/motivation
- This lecture:
 - how to boost motivation
 - how to make procrastination work for you instead of only against you

Major enemies of motivation

- Burning out
- Self-enemy syndrome
- Lack of energy
- Anxiety (can cause lack of energy)
- Lack of purpose
- Lack of clarity

Avoid burning out!

- "I've got everything together. I'm organized. I know what to do. I've got energy. So I'll work hard 14 hours a day"
- Continuous hard work for long periods... without downtime... Leads to burn out!
- How to avoid burning out?
 - Plan breaks throughout the day. Let the mind recover
 - Have deep thinking time. It's still research time, but more relaxed
 - Can happen in a park, on a walk, anywhere where your mind can be creative
 - Have days when you don't do any research. Rationalization for the workaholic: the subconscious mind will think

Self-Enemy Syndrome (popularly called "Imposter Syndrome")

I'm not good enough Do I belong here? Everyone seems better than me



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- What is the point of these worries?
 - Takes mind to a negative state. Not helpful
 - Based on fallacy that you are static...
 but you can power up!
- Wasted mental effort
 - If you aren't good enough, then there's nothing you can do about that anyways. Who cares?



Self-Enemy Syndrome (popularly called "Imposter Syndrome")

Other doubts:

- "What if the strategy I'm using now (which I haven't really tried yet) doesn't work?"
 - Danger: Increasing anxiety stifles creativity. Lost time means less time to test idea
 Result: Lower chance of success. Self-fulfilling prophecy
- "What if my advisor doesn't think my results are good enough?"
 - Don't worry! Your ideas aren't static. They can evolve. Your advisor might have advice
- Again, avoid spending mental effort on negativity. This thinking lowers the chance of success!

Power Up

- "The difference in ability... What about it? Do you think I should give up just because you're stronger than me?"
- "I'm not fighting because I want to win. I'm fighting because I have to win."

Lack of Energy

- "I don't have the energy for a specific type of task right now"
 - Solution: Match the type of work to the time of day (varies per person)
- "I don't feel like doing anything"
 - Solution A: Remember to avoid over-work
 - Solution B: If over-work isn't the issue, health may be the issue.
 - Consider exercising (boosts dopamine, circulation, and general energy level)
 - Consider changing diet
 - Consider increasing sleep
- "I'm physically healthy. I don't know what's wrong..."
 - Might be anxiety

Anxiety

- Working on problem seems unpleasant
- Solution:
 - Consider (write down, if needed) consequences of not starting work on problem
 - If consequences are minor, maybe you don't have to work on problem
 - If consequences are severe, again break problem into smaller chunks that are somehow less unpleasant
 - If small chunks are still unpleasant, set up rewards (habit stacking). Each time I do 30 minutes of calculation, I get a juice reward (for chimpanzees; modify as needed)
 - Try reformulating problem. Maybe it doesn't have to be so unpleasant
 - Specific case might need tedious calculations. General case might need more abstract/creative thinking

Lack of Clarity

- "I know the main task to do, but where do I start?"
 - Makes it difficult to ever start the task. How to fix?
- Solution:
 - Make "plan creation" itself a task, and... MAKE THE PLAN (don't delay it)
 - Plan should break task into manageable chunks (write first paragraph of Introduction, port theoretical results from notes to main text, etc.)
 - Recall: lecture on Time Management. Use Time Bits strategy once some chunks are small enough

Lack of Purpose

- "Why am I doing this?"
- Solution:
 - Revisit your goals. Remind yourself of how this problem fits into your A-list
 - If problem isn't on A-list, maybe you don't need to do it...
 - If problem is on A-list but you don't want to do it, consider if someone else is better suited to do it (bring in a collaborator?)

Unstructured work? Introduce a metronome

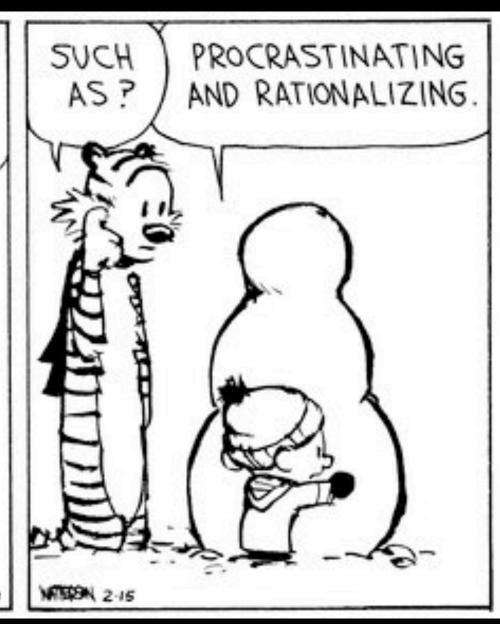
- Have a regular activity: language class, dance class, martial arts class, music lessons, etc.
- Work cannot happen all day. There's a mini-deadline (need to prepare for the class)
 - Psychologically useful. Bounds on time are created, and something to look forward to that breaks up monotonicity (otherwise, work could go on forever, dinner could be delayed, etc.)
- OK to skip regular activity in periods of frenzied work (high motivation periods), but...
 - Careful! Don't skip often. Habits only work if they are habits. Classes/lessons are habits

Procrastination









Optimistic Procrastination

- Started trying an approach, and initial steps are promising. Decide to come back to it later rather than pushing forward. Why?
 - Thought process: "it will probably work. Let's end on a high note". Extend the optimistic period (feel good state) by avoiding potential discovery that the approach will run into trouble later.
 "Don't look down"
 - Related to fear of failure
- Solution: push yourself a little farther (especially if you are in a flow state)
- Think: Better to
 - have your conscious mind bask in optimism while your subconscious mind has nothing to do?
 - OR have subconscious work on the trouble you ran into because you pushed a little further?

Structured Procrastination

- Structured Procrastination: <u>a great, short essay</u>
- "structured procrastination, an amazing strategy I have discovered that converts procrastinators into effective human beings, respected and admired for all that they can accomplish and the good use they make of time"
- Procrastinator's psychology: I'll avoid doing the most important thing on my TODO list by doing something else of lesser importance
 - Vacuuming room instead of writing paper
 - Working on random research idea instead of paper reviewing for a conference

Structured Procrastination

- So, what is the strategy of Structured Procrastination? Use your weakness against itself
 - Have multiple important projects on a list
 - Use self-deception. Give the "highest priority" a deadline, even though nothing bad will happen if the deadline passes (e.g., writing a book chapter, starting on "dream project").
 Deceive yourself into the highest priority item being important, even though it isn't that important

Structured Procrastination

"The trick is to pick the right sorts of projects for the top of the list." The ideal sorts of things have two characteristics, First, they seem to have clear deadlines (but really don't). Second, they seem awfully important (but really aren't). Luckily, life abounds with such tasks. In universities the vast majority of tasks fall into this category, and I'm sure the same is true for most other large institutions. Take for example the item right at the top of my list right now. This is finishing an essay for a volume in the philosophy of language. It was supposed to be done eleven months ago. I have accomplished an enormous number of important things as a way of not working on it... And how important is this article anyway? Not so important that at some point something that seems more important won't come along. Then I'll get to work on it."

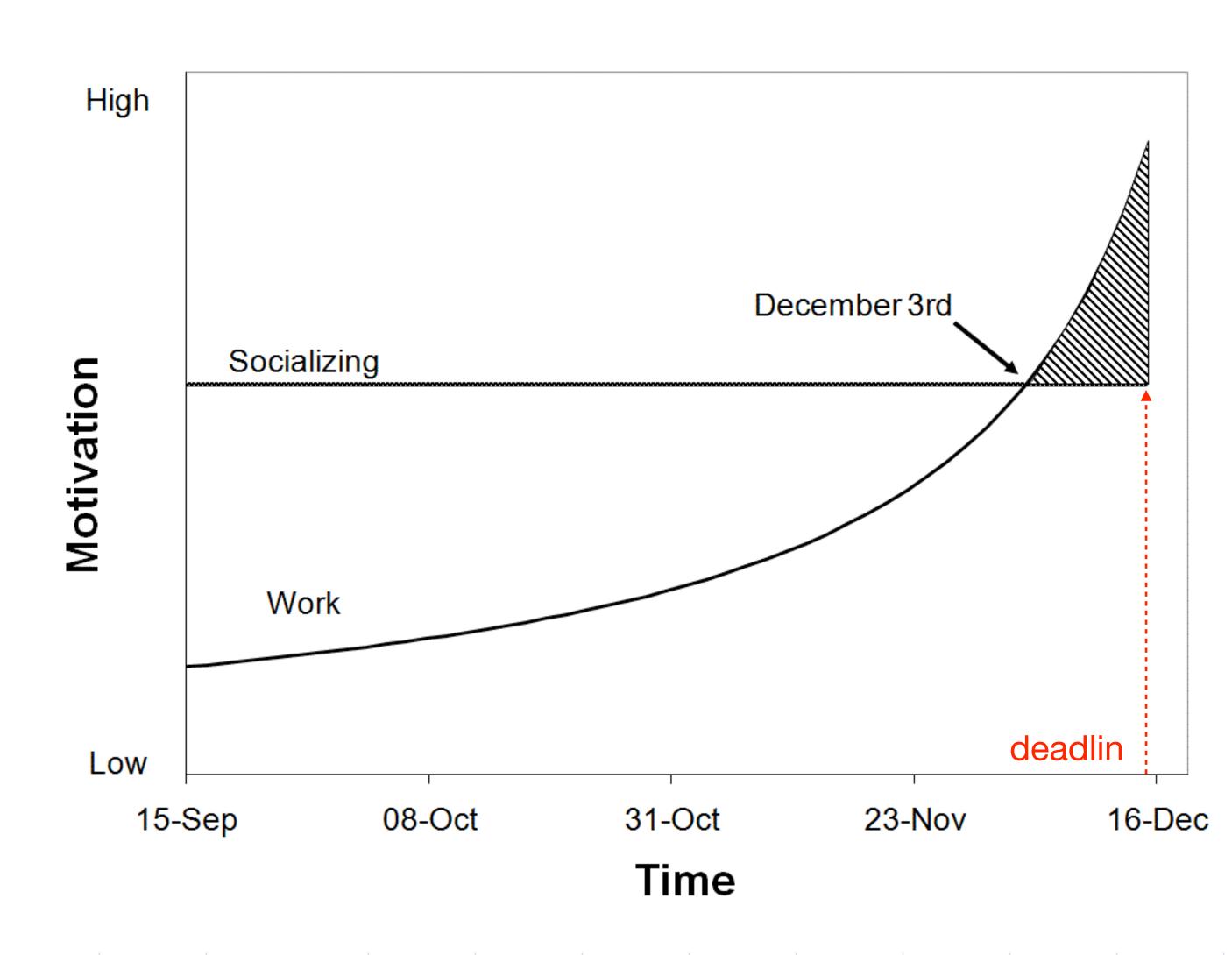
Temporal Motivation Theory

Motivation = Expectancy × Value Impulsiveness × Delay

- Temporal motivation theory a theory of procrastination
 - Expectancy is probability of getting reward
 - Value is reward itself
 - Impulsiveness is how intolerant you are to delays (impulsive types want instant gratification)
 - Delay is how long you wait (on average) to receive reward
- What does it mean?
 - We like large rewards that occur soon (not in a few weeks)

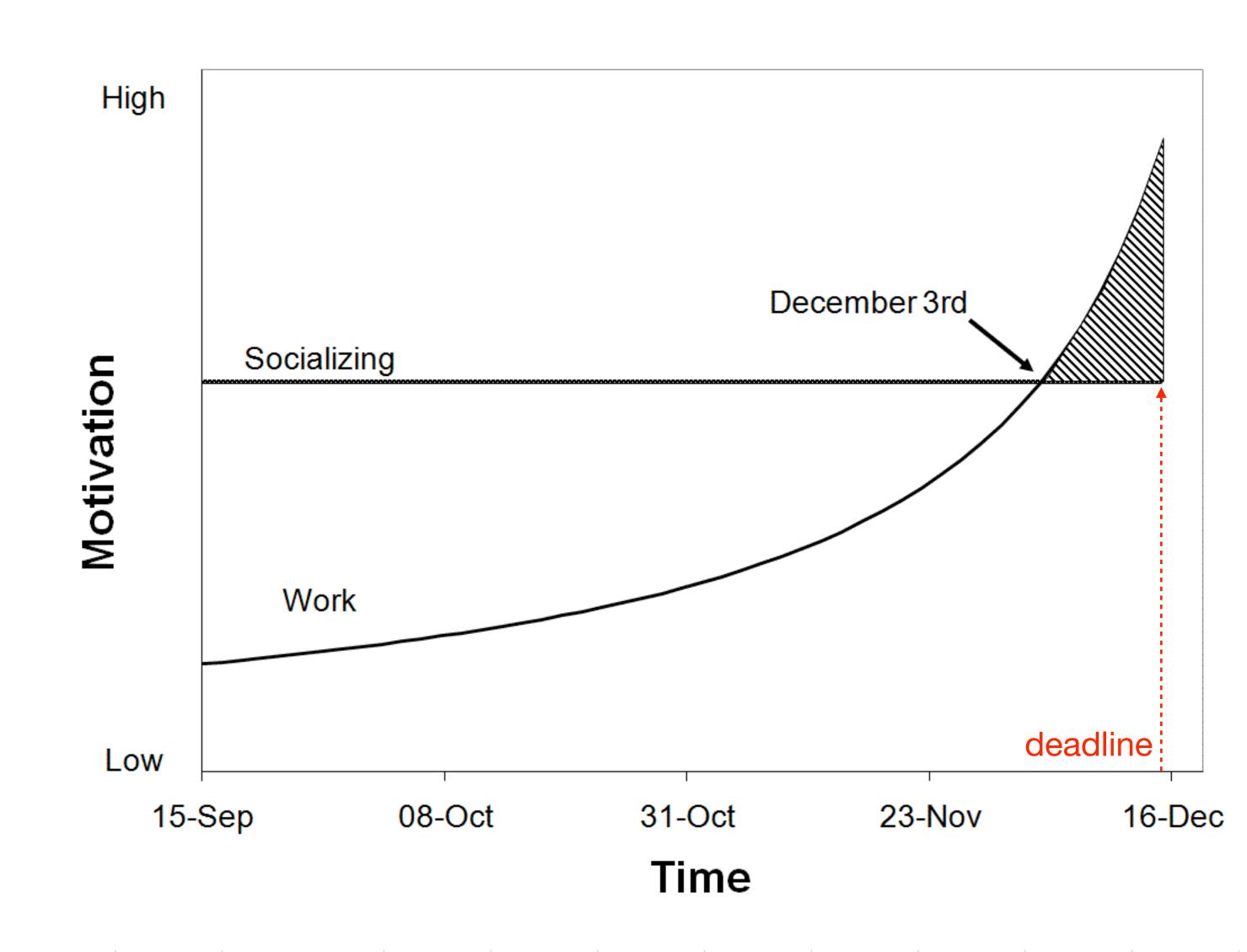
Temporal Motivation Theory

- We like large rewards that occur soon (not in a month)
- Socializing has likely, fixed utility and gives near-instant gratification (small delay)
- For important task with deadline, delay to reward decreases as deadline approaches
- Choose socializing until deadline is close enough, then switch to important task



Temporal Motivation Theory

- We like large rewards that occur soon (not in a month)
- Solution A (reward shaping):
 - Can you make the deadline earlier?
 - How? Submit to arXiv OR set up meeting to share results with advisor
- Solution B (task breaking)
 - Can you split the task into smaller tasks, with earlier deadlines?



Parkinson's Law

- Parkinson's Law: work expands so as to fill the time available for its completion
- Solution: Don't leave lots of time for tasks that don't need the time
 - There are tasks for which "anytime" solutions are fine
 - writing informal emails
 - packing (if you have what you need, putting it in a bag is trivial)
 - cooking (can and will be done in 30 minutes if that's all the time there is)

Parkinson's Law

- Parkinson's Law: work expands so as to fill the time available for its completion
- Example from Parkinson:
 - "Thus, an elderly lady of leisure can spend the entire day in writing and despatching a postcard to her niece at Bognor Regis. An hour will be spent in finding the postcard, another in hunting for spectacles, half-an-hour in a search for the address, an hour and a quarter in composition, and twenty minutes in deciding whether or not to take an umbrella when going to the pillar-box in the next street. The total effort which would occupy a busy man for three minutes all told may in this fashion leave another person prostrate after a day of doubt, anxiety and toil."

Scheduling Algorithms for Procrastinators

Key points:

TODC

Scheduling Algorithms for Procrastinators

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If once a man indulges himself in murder, very soon he comes to think little of robbing; and from robbing he comes next to drinking and Sabbath-breaking, and from that to incivility and procrastination.

— Thomas de Quincey

Abstract

This paper presents scheduling algorithms for procrastinators, where the speed that a procrastinator executes a job increases as the due date approaches. We give optimal off-line scheduling policies for linearly increasing speed functions. We then explain the computational/numerical issues involved in implementing this policy. We next explore the online setting, showing that there exist adversaries that force any online scheduling policy to miss due dates. This impossibility result motivates the problem of minimizing the *maximum interval stretch* of any job; the interval stretch of a job is the job's flow time divided by the job's due date minus release time. We show that several common scheduling strategies, including the "hit-the-highest-nail" strategy beloved by procrastinators, have arbitrarily large maximum interval stretch. Then we give the "thrashing" scheduling policy and show that it is a $\Theta(1)$ approximation algorithm for the maximum interval stretch.

1 Introduction

We are writing this sentence two days before the deadline. Unfortunately that sentence (and this one) are among the first that we have written. How could we have delayed so much when we have known about this deadline for months? The purpose of this paper is to explain why we have waited until the last moment to write this paper.

Create Social Pressure

- Commitment devices:
 - Schedule a meeting where you promise to share some results (or at least some progress)

Productive Procrastination

- Life stuff (personal relationships) helps avoid burning out
- Boring life stuff (paying bills, getting groceries) helps avoid loan sharks and starvation
- Learning Builds skills or knowledge
 - read a science article or politics article or some good long-form journalism (Harper's)
 - read a random paper that your list of 100 interesting but not pressing papers to read "some time"
- Creating (obviously) exercises creativity
 - try writing a short story
 - cook a new dish (think of your own innovations; don't strictly follow a recipe)
 - do some "recreational mathematics"