

ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

– **MASTER THESIS** –

*To obtain the academic degree Master of Science in
Economics and Business, with a specialisation in Behavioural Economics*

Title of the master thesis:

Procrastination: The battle against yourself

Student name: Jonathan Hauff Ortega

Student ID: 495935

Supervisor: prof.dr. (Peter) PP Wakker

Second assessor: prof.dr. (Aurelien) A Baillon

Date final version: July 24, 2022

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

TABLE OF CONTENTS

1. Introduction	3
2. Theoretical background	4
2.1. Motivation	5
2.2. Definition	6
2.3. Will power and hyperbolic discounting	8
2.4. The <i>Planner</i> and the <i>Doer</i>	9
2.5. Visceral influences	10
2.6. Economic models of procrastination	11
2.6.1. Salience costs (Akerlof, 1991)	11
2.6.2. <i>Choice and Procrastination</i> (O'Donoghue and Rabin, 2001) ...	12
2.6.3. A review of <i>Picoeconomics</i> (Ross, 2010)	13
2.7. Connecting the world of models with cognitive psychology	14
3. The Laws of Task Avoidance	16
3.1. The Laws	17
<i>First.</i> Parkinson's Law.	18
<i>Second.</i> Parkinson's Law of Triviality.	21
<i>Third.</i> Law of Aversiveness of Effort.	22
<i>Fourth.</i> The Parabolic Law of Effort.	24
4. How to fight the <i>instant gratification Monkey</i>	26
4.1. An extended model of procrastination	27
4.2. A guide to fight the <i>instant gratification Monkey</i>	29
4.2.1. The Three Pillars of Performance: <i>A practical approach</i>	29
4.2.2. The Triangle of Productivity and some methods to take advantage of it	29
4.2.3. Some methods to reduce procrastination	30
5. Conclusion	32
6. References	34

Procrastination: The battle against yourself

By Jonathan Hauff Ortega

“It is the busiest [wo]man who has time to spare.”

Proverbial phrase (Parkinson, 1957, p. 2).

1. Introduction

Procrastination is the tendency to delay the tasks that one has planned to take care of in advance. It is a battle that happens within the mind. Every action an individual is willing to undertake must be planned first to be executed afterwards. The time that passes in between planning and execution is not referred to as procrastination until this period exceeds what the individual had desired.

The term procrastination is often used in everyday language when referring to the unintended postponement of starting or finishing a task that one had planned to do. In psychology, the term procrastination is used widely, not only to describe everyday situations, but also to refer to a chronic task-avoidant behaviour. Since clinical psychology is beyond the scope of this research, this thesis will focus on the everyday usage of procrastination. The analysis is meant to be from a behavioural and economic perspective. Hereafter, procrastination refers to the *“delay that is unnecessary, irrational, or even harmful”* (Klingsieck, 2013, p. 25) for the individual who is willing to accomplish a planned task. A German professor of psychology, Katrin Klingsieck, introduced a seven-aspect framework to distinguish procrastination from other forms of delay. This framework will be explained in chapter 2.2. when defining the scope of the topic.

This thesis is conceived as a theoretical and philosophical study. The approach of my research is not answering a specific question but expanding the available discussion on procrastination. This thesis is divided into four chapters, each aiming to introduce and develop one of the following topics:

Chapter 2. Theoretical Background: *What is procrastination?*

Chapter 3. The Laws of Task Avoidance: *Why does it happen?*

Chapter 4.1. An extended model: *Which battle are we fighting?*

Chapter 4.2. The solution: *A short practical guide based on the theory.*

The core purpose of this paper is to introduce a solid theoretical background that serves as the base to formulate a new theory and expand an old model. The new theory is called *The Laws of Task Avoidance*. The content of this theory is attributed to different authors who will be cited properly in Chapter 3. As will become clearer in Chapter 3, *The Laws of Task Avoidance* are a compilation of behavioural patterns that researchers have identified in their work. I have collected and expanded the different sources of knowledge, rather than the inventing a new framework.

The second addition to the literature is the expansion of an old model in Chapter 4. This extended economic model of procrastination is based on Thaler and Shefrin (1981). It includes an addition of new characters, the redefinition of the hierarchy, and the limitation of the game the characters play. It is not changing the coin; it is rather changing the side. In addition to the theory and the expansion, I propose two frameworks as a complement: *The Three Pillars of Performance* and *The Triangle of Productivity*. The first one has both a theoretical and practical application, while the second one is rather practical.

Procrastination is the *Picoeconomical* challenge that keeps us from achieving many of our goals. With *Picoeconomical* I refer in this thesis to Ainslie's (1992) theory. Procrastination is the battle of the multiple selves. It is the intra-personal battle against time and choices. It is not about deciding for today, but for tomorrow.

2. Theoretical background

A large portion of the population are habitual or even chronic procrastinators in one or more situations of their lives. This behaviour results in decreases in performance in those situations, as well as a decrease in overall well-being. It is important to stress out, that procrastination takes place even in situations that we neglect, such as personal finances (e.g., retirement savings) and unhealthy habits (e.g., smoking, exercise, etc.).

This section presents the answer to the question: *What is procrastination?* Here I collected different perspectives on procrastination from psychologists and economists. The first part of this section presents studies and definitions around this behavioural phenomenon, the second part introduces theoretical and philosophical

approaches to procrastination, while the last part offers a bridge between the world of economic models and procrastination in humans from a psychological perspective.

2.1. Motivation

Academic procrastination is a very common practice of delaying study-related work unintentionally, often going against one's plans and expectations. This behaviour can be found among students everywhere. Although this thesis focuses on the general behaviour of task delay and avoidance, the challenge that students face in the field of academics when the deadlines for exams, assignments, and class presentations approach is very similar to what everyone feels in other fields of life, such as personal finances and health.

Every student knows it. An assignment has four weeks to be submitted, but most of the work gets done the evening before the deadline. An exam is taking place in six weeks, but the learning starts less than a week in advance. The presentation gets prepared in the morning before the seminar takes place. These cases happen so often among students that they have attracted the attention of researchers, pedagogues, and even policy makers, who would like to understand and treat procrastination to reduce stress and overall wellbeing.

In a recent study conducted by Rozental et al. (2022), students from diverse universities in Sweden were asked in an anonymous online survey to self-report different measurements that cause or result from procrastination with the purpose of differentiating casual procrastinators from chronic procrastinators who might need an intervention. Rozental et al. (2022) used two psychological instruments (Pure Procrastination Scale; Pathological Delay Criteria) to classify the severeness of procrastination among the students in the sample, as well as further instruments to measure impulsivity, perfectionism, anxiety, depression, stress, and quality of life. The latter are popular causes and consequences that constant procrastinators face. Among the casual procrastinators about half (42-48%) of the participants considered procrastination to be a personal hurdle, while among the severe procrastinators *"almost every participant (96–97%) considered procrastination to be a problem"* (Rozental et al., 2022, p. 7). Thus, a large portion of the (student) population faces procrastination in a way that decreases their personal wellbeing.

According to Rozental et al. (2022), constantly delaying tasks, particularly when the individual is aware of the personal harm caused by the delay, results in personal

self-doubt, stress, and anxiety even after the “*procrastination episode*” took place (Rozenal et al., 2022, p. 11). Although procrastination is a common phenomenon among university students, it is as well a common problem in the general population. Rozenal et al. (2022, p. 3) explain that the general literature suggests that among students 50% face severe procrastination, while among the adult population around 20% face this as a chronic behaviour. Rozenal et al. see procrastination as a “*failure in self-regulation*” and affirm that procrastinators “*often lack the necessary resources or strategies to overcome problems on their own*” (2022, p. 2). When this is the case, a professional intervention might be necessary. However, chronic procrastination is a case for clinical psychology and out of the scope of this thesis. With the study of Rozenal et al. (2022) in mind, this thesis aims to understand the procrastination discovered in psychology from an economic perspective.

2.2. Definition

According to psychology professor Katrin B. Klingsieck (2013, p. 24), the phenomenon of procrastination is “*the needless delay of things one intends to do*”. In her academic article *Procrastination: When Good Things Don't Come to Those Who Wait* (2013) she presents an overview of the research progress in psychology on procrastination until the late 2000's. In this article she mentions that procrastination diminishes the “*subjective well-being*” of a person, and she presents diverse studies which suggest that procrastination correlates with decrease in performance and mental health, as well as with increase in anxiety and stress in professional, academic, and personal environments (2013, p. 24).

One of the contributions of the aforementioned article is that it proposes a common definition of this behavioural phenomenon, which is based on the recent studies of the topic at the time of being published. The article also provides a distinction between procrastination and other forms of functional delay, she explains the latter as a delay that is intentional and that may result from prioritizing or strategizing. “*The delay that is unnecessary, irrational, or even harmful is what distinguishes procrastination from strategic delay*” (Klingsieck, 2013, p. 25).

Table 1 presents the seven aspects of procrastination by Klingsieck (2013, p. 26), which will serve throughout this thesis as a basic framework to model and understand this phenomenon from an economic perspective. Following this seven-aspect framework and extending the definition of other researchers, professor Katrin

B. Klingsieck defines procrastination “as the voluntary delay of an intended and necessary and/or [personally] important activity, despite expecting potential negative consequences that outweigh the positive consequences of the delay” (2013, p. 26).

Table 1. The 7 aspects of procrastination¹ – Klingsieck (2013, p. 26)

-
1. An overt or covert act is delayed.
 2. The start or the completion of this act is intended.
 3. The act is necessary or of personal importance.
 4. The delay is voluntary and not imposed on oneself by external matters.
 5. The delay is unnecessary or irrational.
 6. The delay is achieved despite being aware of its potential negative consequences.
 7. The delay is accompanied by subjective discomfort or other negative consequences.
-

¹The author introduces this table not as a framework, but as a comparison between procrastination and strategic delay.

Example 1. Procrastination (compare with Table 1)

Anton loves to play the guitar but must submit an assignment next week.

1. He starts playing the guitar now instead of writing the assignment.
 2. He delays the start of the assignment, although he had intended to not do so.
 3. If he does not complete the assignment by the deadline, he will fail the course.
 - 4./5. He has free time now and nothing would stop him from seating at his desk and start.
 - 6./7. He is aware of the personal harm of leaving the work for later and feels guilty about it.
-

Example 2. Strategic delay (compare with Table 1)

Berta is a manager, and she must prepare a long project for the end of the month in case a client accepts the offer of the company.

1. Berta prioritizes the other items of her agenda and delays the start of this project.
 2. The start of the project is intended to gain time if the client accepts the offer.
 3. The project is part of her professional duties and therefore also of personal relevance.
 4. She chooses to delay believing the odds of a cancellation are in her favour.
-

Examples 1 and 2 above illustrate the differences between two behaviours that involve the postponement of an intended task: *Procrastination* and *strategic delay*. As described by Klingsieck (2013), the differences between both forms of postponement of action are in aspects 5, 6, and 7 of Table 1. Strategic delay is at least subjectively perceived as rational or necessary, it is not achieved despite the awareness of negative consequences, and it does not result in personal discomfort or negative consequences. Nevertheless, these aspects (5, 6, 7) do not imply that a strategic delay cannot be unnecessary or harm the self-interest of the individual by other means or third parties. What it implies, is that the individual chooses the strategic delay with the best intention to do so and increases at least its subjective wellbeing by doing so.

Klingsieck's (2013) definition of procrastination and its distinction to functional forms of delay presents both behaviours as opposites, one causing personal harm and the other not. However, bestselling author and professor Adam Grant presents in his book *Originals: How non-conformists move the world* (2017), a milder picture of procrastination that combines aspects of the two definitions from above. Grant presents an unintended form of procrastination that might be harmful for the individual during the delay but positive in the long run, which he refers to as "*Strategic Procrastination*" (Chapter 4, 2017).

In some situations, Grant explains, delaying reduces the risk involved with the activity, because it forces the individual to think twice before acting. In those moments waiting reduces impulsiveness. "*Procrastination may be the enemy of productivity, but it can be a resource for creativity*" (Chapter 4, 2017). According to Adam Grant, procrastination can mean *laziness*, but it can also mean waiting for the right moment. Grant suggests that procrastination lets ideas mature, increases creativity, and opens the door to improvisation, three concepts that are key for artists, scientists, and innovators.

Besides the positive aspects of procrastination, this thesis focuses on the definition introduced earlier, which restricts procrastination to an individually harmful behaviour that shall be corrected.

2.3. Will power and hyperbolic discounting

Procrastination is a behaviour that results from impulsiveness, which itself is a lack of will power. In the "*Précis of Breakdown of Will*", George Ainslie (2005) presents

a compressed version of his book published in 2001 under the same title. In this précis, Ainslie (2005) proposes a more realistic model of impulsiveness based on a function of hyperbolic discounting, that he argues contradicts the rational expected utility model on how humans discount future events. Ainslie (2005) builds his model of hyperbolic discounting on what Aristotle called *Akrasia*, which refers to a voluntary self-defeating behaviour. Thus, the lack of will that results in procrastination harms the subjective welfare of an individual, even when the individual is aware of it.

Ainslie (2005) affirms that discounting does not automatically mean impulsiveness, since a rational agent will discount the value of payoffs that take place in the future as well. However, according to Ainslie (2005) impulsiveness means that there is no stability in the preferences across time, which contradicts the actions of a rational agent. Humans have a “*tendency to prefer smaller rewards over larger ones temporarily, when the smaller reward is imminently available*” Ainslie (2005, p. 636).

The hyperbolic discount function, contrary to the exponential function, does not result in constant preferences, which is a more accurate model of the self-defeating behaviour that is key to procrastination. Table 2 presents a comparison of the value discounting function of a rational agent and of a human facing *Akrasia*, as described by Ainslie (2005). Ainslie models “*The self as a population*” (2005, p. 637), which results in an analogy of an internal intertemporal marketplace where a *present self* and a *future self* compete for the control of an individual. This analogy comes from the theory of *Picoeconomics* by George Ainslie (1992) that will be used when expanding a model of procrastination in the last chapter.

Table 2. Comparison of value discounting functions – Ainslie (2005, p. 636)

(1) Rational agent - Exponential discounting:

$$Value = Value\ at\ no\ delay \times (1 - Discount\ rate)^{Delay}$$

(2) Human with *Akrasia* - Hyperbolic discounting:

$$Value = \frac{Value\ at\ no\ delay}{[Constant + (Impatience\ factor \times Delay)]}$$

2.4. The *Planner* and the *Doer*

Self-control and procrastination go hand in hand. A higher level of self-control reduces procrastination, and the opposite is true as well. The academic article *An*

Economic Theory of Self-Control by Thaler and Shefrin (1981) presents a model that uses agency theory, as studied in theory of the firm, and applied in management, to understand why individuals act in different ways from what they originally planned to.

Thaler and Shefrin (1981) identified, that if the individual is modelled as an organisation with multiple characters that live inside the mind, then rational choice theory is not violated. Their model represents the discrepancy between planning and executing. In the two-self model of Thaler and Shefrin (1981) the mind is modelled as if it would contain two characters: “*a farsighted planner and a myopic doer*” (p. 392).

There is an agency conflict between both characters. There is the *Planner*, who would like to maximize overall personal utility for the individual, but who is not able to execute in the present, and then there is the *Doer*, who cannot see into the future (i.e., myopic), but has the power to act now. The two characters coexist across time, which creates an intertemporal conflict between them. The conflict of interest is that both, the *Planner*, and the *Doer*, want to maximise their individual utility but doing so might result in moral hazard from the *Doer's* side, if the expectations of the *Planner* don't align with the options and choices the *Doer* has today. As possible solutions to the conflict, Thaler and Shefrin (1981) propose that the *Planner* should alter the incentives of the *Doer*, or that the planner should imposes rules (e.g., pre-commitments) on the *Doer* to behave accordingly to what maximises the overall welfare of the individual.

2.5. Visceral influences

George Loewenstein (1996) presents a behavioural-economic analysis of the impact of visceral influences on self-control. Loewenstein defines visceral factors as a “*direct hedonic impact*” that influences “*the relative desirability of different goods and actions*” (1996, p. 273). He notes that people report feeling “out of control” when visceral influences appear, even when they are aware at the moment of taking action of the negative impact of their impulsive behaviour.

In many aspects the feeling of being out of control relates to procrastinating behaviour. Staying longer in bed than intended or delaying the start of an assignment to perform a more pleasant activity are examples of procrastination that result from being out of control. Loewenstein proposes a model of the impact of visceral influences on behaviour that accounts for the “*disproportionate impact*” of visceral factors that arise “*here and now*” on the individual decision making (1996, p. 276).

Loewenstein's model accounts for the momentary personal utility of acting impulsively that causes regret in the aftermath of the event, rather than the momentary salient cost of not choosing the intended and overall desired action, i.e., procrastinating (as in Akerlof 1991, see next sub-section). Loewenstein points out that the feeling of regret in the past resulting from visceral influences or the one experienced by others are "*underweighted*" or ignored when acting "*here and now*" against intended actions (1996, p. 276).

Loewenstein (1996) formulates seven descriptive propositions on how visceral factors impact behaviour. One that is particularly related to procrastination says: "*People underestimate the impact of visceral factors on their own future behavior*" (Proposition 5, Loewenstein, 1996, p. 278). Therefore, people underestimate that some of those visceral influences, such as comfort, hunger, and pleasure, will increase the tendency to delay a course of action in the future, even if they are aware that it happened already in the past.

Loewenstein describes the impact of visceral factors on behaviour to be dependent of the level of intensity of those factors. If arising in low levels, such as being slightly hungry, people can maintain the control and behave rational. However, when presented intensively, people may behave "*arational*", which is the case when "*people don't perceive themselves as making decisions at all*", e.g., falling asleep while driving (Loewenstein, 1996, p. 289). What happens in between these two extreme scenarios is the irrational behaviour that causes, among other actions, procrastination.

2.6. Economic models of procrastination

2.6.1. Salience costs (Akerlof, 1991)

Procrastination and Obedience by George Akerlof (1991) is among the first and most recognized academic publications about the economics of procrastination. Akerlof states that procrastination does not maximize the overall utility of an individual and that although it might seem like a small error "*at the time of the decision*", it will ultimately result in big regrets (1991, p.1). Akerlof (1991) introduces a model in which procrastinating is preferred in the present, rather than performing a task with high salient costs that has a higher expected future reward.

Table 3 summarizes the three key features of an event that ultimately leads to procrastination (1991, pp. 3-4). According to these features, procrastination is superior to executing a task, when the cost of undertaking the task multiplied with the extra

salience of acting now are higher than the current benefit of completing the task. This is expressed mathematically as: $\delta c > x_t$ (see Table 3). This expression explains why maximising momentary utility is preferred and how this gets repeated in the next period if the cost structure of performing the task and the rewards of completing it remain the same.

In the words of Akerlof, procrastinating repeatedly results in “*Many wrong decisions all of the same type but of small value cumulated into a significant loss*” (1991, p. 4). Akerlof’s (1991) model is crucial to the literature of economics of procrastination and introduces to economics the nowadays common understanding that the bounded cognitive structures of humans lead to costly welfare losses over time.

Table 3. The three key features of procrastination¹ – Akerlof (1991, pp. 3-4)

<u>Feature</u>	<u>Mathematical expression</u>
1. Time between decisions is short.	
2. Salience costs of performing a task are present in each period.	$\delta c > x_t$
3. There is dynamic inconsistency in decision making.	

¹ δ is the procrastination factor (extra salience of undertaking the task now); c is the cost of undertaking the task; x_t is the benefit of finishing the task in period t .

2.6.2. Choice and Procrastination (O'Donoghue and Rabin, 2001)

O'Donoghue and Rabin in their academic article *Choice and Procrastination* (2001) introduce a new approach on the economics of procrastination that accounts for more than one choice, i.e., a menu of decisions an individual must choose from, since it is not possible to perform many tasks simultaneously. They claim that a person will procrastinate more when facing with more than two tasks to choose from. O'Donoghue and Rabin (2001) affirm, as previous researchers, that humans do not face time-consistent preferences, but rather take present-biased decisions, often prioritizing immediate gratification.

Besides introducing a procrastination model based on choice menus, they also introduce a more realistic agent to their model that does not rely on the assumption of fully sophistication. For behavioural economists a fully rational agent does not represent a human in a theoretical model, rather a bounded rational agent is a better

approach to a human. O'Donoghue and Rabin (2001) distinguish between three levels of bounded rationality inside an individual's beliefs of their future decisions: Sophisticated, partially naïve, and naïve. An individual who is sophisticated is “*fully aware of her future self-control problems*” and one that is naïve is “*fully unaware of her future self-control problems*” (O'Donoghue and Rabin, 2001, p.122). Hence, a sophisticated agent will expect that her future preferences lean towards immediate gratification and commit *a priori* to not fall into procrastination.

On the other side, a naïve agent will not plan according to the changes in preferences and will tend to delay tasks more often. Since the two extremes don't apply to every scenario in real life, O'Donoghue and Rabin base their model on a third profile that is partially naïve, thus, she “*is aware that she will have future self-control problems, but underestimates their magnitude*” (2001, p. 122). O'Donoghue and Rabin (2001) also note that a *quick fix* can help a person to start a task, but that it also may prevent the person to finish it. They refer to the quick fix as an action that contributes to solving the task and that makes the person gain positive benefits in the short run with the aim of coming back in the future to finish the task.

2.6.3. A review of *Picoeconomics* (Ross, 2010)

Ross (2010) describes procrastination as the source of costly decisions, which he presents as the compulsive consumption of instant gratification rather than the patience for larger rewards in the future. Ross (2010) mentions the important assumption in economics that humans are susceptible to the aversiveness of effort, which partly explains why humans prefer smaller rewards in the present over larger rewards in the future (more about this assumption in the next chapter).

The reasoning behind the aversiveness of effort, which comes from traditional economic theory, is that effort is a cost, and an economic agent always tries to avoid or minimise costs. However, the costly mistakes resulting from procrastination seem to often be forgotten by the individual, since it is very likely the case that procrastination will be repeated when performing the next task. Ross notes that “*the procrastinator fails to learn to predict future procrastination from his or her own history of past procrastination*” (2010, p. 29), because the individual lacks the ability to formulate expectations about her future present-biased preferences.

Ross offers a review of many of the important theories on the economics of procrastination in his essay. He explains the theory of *Picoeconomics* by George

Ainslie (1992) and notes that according to it a person can be modelled as an organisation with more than one agent. Following the principles of *Picoeconomics*, a person is divided into multiple characters inside the self that could act “synchronously” as a “community of agents”, or who could act “diachronically” resulting in a “sequence of agents” (Ross, 2010, p. 31).

The first interpretation of the mind, *synchronously*, is how the *Planner* and the *Doer* from Thaler and Shefrin (1981) co-exist as one organisation in their model of self-control. The second interpretation, *diachronically*, is the idea of a present-self that acts prior to a future-self, where the two agents never co-exist as an organisation, but rather exist one after the other. Ross concludes that the hyperbolic function proposed in *Picoeconomics* “describes procrastination but cannot explain it” (2010, p. 48). He suggests, that “hyperbolic discount functions resemble Akerlof’s δ parameter” (Ross, 2010, p. 49), which is a procrastination factor that accounts for the extra salience of acting now.

2.7. Connecting the world of models with cognitive psychology

In classical economic theory agents are modelled as rational, which involves the assumption that agents are utility maximisers, and therefore will act opportunistic. However, behavioural economists have aimed to create a more realistic persona for economic models, perhaps one that has some room for altruism, biases, and cognitive errors.

Organisations, just as humans, often need to create rules and methods against opportunistic behaviour from agents inside and outside the organisation. Similarly, when the mind, or better said a human, is modelled as an organisation with multiple characters operating inside, rather than a single agent, it is possible to encounter opportunistic behaviour between the *fictional* players. Hence, the myopic *Doer* acts opportunistic, often harming the farsighted plans of the *Planner* and even going as far as harming the overall welfare of the organisation (i.e., the human that is being modelled as a multi-self-entity). Of course, in the real world the mind operates by one single human as a single entity. Nevertheless, seeing it as an organisation helps understand the *Picoeconomic* debate of intertemporal choices.

The question that remains open is the usual critic economists face when conversing with researchers and non-academics from other disciplines: What can we learn from a (multi-self) model that expands our understanding of the behaviour

experienced by humans? To answer this question, a model of cognitive psychology might be useful. One that offers a bridge between economic models of procrastination and procrastination in humans. This bridge is Mental Time Travel (MTT), a term used in psychology to refer to the ability of humans to vividly remember the past and create an image of the future (Boyer, 2008).

MTT “provides a motivational ‘brake’ that counters natural dispositions towards opportunistic, short-termist, ‘myopic’ decision making” (Boyer, 2008, p. 219). MTT shapes the way humans make decisions. A person will avoid engaging again in experiences that were stressful or not pleasing in the past, such as returning to a restaurant with bad service. The same person will engage in activities today with expectations that these will have a certain outcome in the future, for example, pursuing a degree to work in a certain profession one day. The ability to reactivate the experiences of the past in the brain and create expectations of the future is what allows a multi-self model of procrastination to make sense in the first place. Without the capacity of MTT only the myopic *Doer* would exist, and the feeling of instant gratification would shape every decision an individual takes.

According to Pascal Boyer, one crucial function of MTT is the ability to “*Foresight and flexible planning*”, which means that memories can be stored as episodes that are recalled later to allow for adaptiveness and changes in planned actions (2008, p. 220). Boyer (2008) recognizes that for humans the present is more valued than the future, and therefore humans time-discount payoffs and costs that are not taking place now. Additionally, Boyer (2008) notes that MTT is as well a barrier to temptation, since one’s moral feelings are attached to what has been experienced and what is expected to come. This aspect is crucial to understand why procrastination does not dominate every aspect of our life and why will power exists. Being able to imagine the consequences of an action stops us from procrastination.

Boyer (2008) confirms Ainslie’s view on *Picoeconomics* (Ainslie, 1992) that humans discount function is hyperbolic, and that this allows for preferences to be reversed and inconsistent across time. Boyer (2008) concludes, that in evolutionary terms MTT is a feature in humans that increased fitness by increasing loss aversion. He states that “*Emotions connected to episodes constitute self-persuasion devices*” (Boyer, 2008, p. 221), which reaffirms why procrastination is possible in bounded rational agents, since emotions vary in magnitude and do not always convince us to not procrastinate.

3. The Laws of Task Avoidance

The previous theoretical background presented an overview of the theory of procrastination. It summarised the most relevant views on the topic, but it did not explain why we fall into the trap of delaying what we intent to get done. In this section, that explanation is given. The particular interest for this section is to offer a theoretical explanation on the reason humans commit costly delays repeatedly. Procrastination is, at least from a long-term paternalistic perspective, an unwanted behaviour. To understand this reason an analysis into the core action of procrastination is needed.

Figure 1 introduces *The Three Pillars of Performance*, a simple framework to describe the three forces involved in the transformation of action into performance. It is commonly known that an action provokes a re-action, and that an object is only able to change or move if energy is involved in the process. This principle is extended here to display human behaviour. When a human performs a task, regardless of it being intended or unintended, energy is required to transform the action into the performance. Energy here takes the form of mental and physical effort, as well as time. Procrastination as a behaviour involves *The Three Pillars of Performance: mens, corpus, and tempus* (from the Latin words: mind, body, and time).

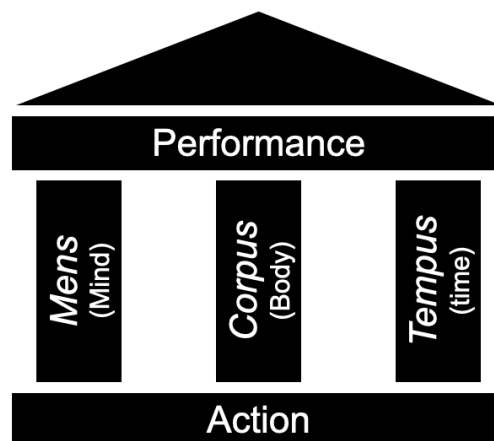


Figure 1. The Three Pillars of Performance

The same three pillars are involved in every task a human intends to perform. Some of them, such as habits, are performed automatically and perceived as costless. Some other actions, particularly the ones we enjoy, are not only perceived as costless, but even as well-fare improvers, so that the three pillars involved in it appear to be non-existent. However, the three pillars are always involved, sometimes in the same ratio,

but more often in different proportions. A habit requires less *mens*, more *corpus*, and a constant use of *tempus*. On the other side, getting results from exercise will take some time, a lot of body effort, and less use of the mind. Studying requires a lot of *mens* and *tempus*, but little *corpus* to perform.

Understanding *The Three Pillars of Performance* is crucial to understand why humans procrastinate, as well as why humans get involved in self-defeating actions (i.e., *Akrasia*). We procrastinate when we neglect the existence of one or more pillars, or when we believe actions magically result in performance. The *corpus* is the physical effort involved in the transformation of action to performance and is what it is commonly associated with procrastination. The misconception is to believe that physical effort alone is the cost of performing. An individual delays the work needed because a physical action is involved in the process, one that is exhausting or at least appears to be. Nevertheless, mental effort is needed to perform any task. In the case of procrastination, it is often the mental costs the ones that keep us from achieving performance.

The ratio of *mens*, *corpus*, and *tempus* varies across actions, but the blockade is inside the mind, not in the body nor the time. *A priori* to acting, the perceived costs of the three pillars are distorted to match what we like and dislike. *A posteriori* to performing, the experienced costs do not necessarily match the real costs of the three pillars, but they do change to what was expected. This explains why it is very often the case a task feels easy after its done.

3.1. The Laws

The simple framework described above helps to understand the costs associated when transforming actions into performance. In the following part of this section *The Laws of Task Avoidance* are introduced. These laws of human behaviour display the challenges humans face when aiming to perform a task. The difference with the pillars above is that they explain why humans are pulled by the forces of procrastination, while the three pillars just explain the components of effort (costs) involved in any task, not just the ones that get postponed. Table 4 presents an overview of the four *Laws of Task Avoidance*, that build the puzzle on how humans are pulled towards delaying the start or completion of a task.

Table 4. The Laws of Task Avoidance		Author, year
First	Parkinson's Law	Parkinson, 1955
Second	Parkinson's Law of Triviality	Parkinson, 1957
Third	Law of Aversiveness of Effort	Compilation of authors
Fourth	The Parabolic Law of Effort	Hauff, 2022

Note: The authors might not have formulated this originally as a behavioural law.

There are three main assumptions involved with the *The Laws of Task Avoidance*: Saliency that results in impatience, the compound effect of actions, and the entry barriers of effort. These three assumptions are needed to create the compilation of laws in Table 4 and for it to be logically valid.

Saliency refers to the tendency of humans to overvalue the recent past and undervalue cold facts. Saliency costs are taken into account in the intra-calculation to perform a task, that happens usually very fast. The vividness of recent experiences takes more weight in decision making, so that even if costly mistakes were made in the farer away past, they are not valued properly in the ongoing planning.

The compound effect of action is a concept borrowed from finance usually referred to as the compound interest, which is how a small interest on a certain amount can cumulate to a fortune over longer periods of time. Akerlof identified the problem of the compound effect in procrastination and noted that "*each error small at the time of the decision, cumulate into serious mistakes*" (1991, p. 1). The assumption is that the compound effect applies to performance and therefore postponing small things will result in costly situations over time.

The entry barrier of effort is another borrowed concept, but this one well known across many branches of economics. Every action requires a certain amount of effort. No action is effortless. This assumption refers to *The Three Pillars of Performance*. Knowing that every activity involves costs is important for the laws to be presented below, specially the third one.

First. Parkinson's Law.

Work expands so as to fill the time available for its completion.

C. Northcote Parkinson (1955)

In an article published in 1955 in *The Economist*, Cyril Northcote Parkinson introduced for the first time the *Parkinson's Law* (named by himself). In this article he starts by describing how an old lady spends the whole day sending a postcard to her niece, while he points out that the same task would “occupy a busy man for three minutes” (Parkinson, 1955). Since then, *Parkinson's Law* has been used in many publications on organisational efficiency and personal productivity. In this thesis I borrow this concept to formulate the first *Law of Task Avoidance*, which is crucial to understand why we procrastinate. Figure 2 is a Graph taken from the internet and published by Consuunt (2021) that visualizes the expansion of work throughout the time available.

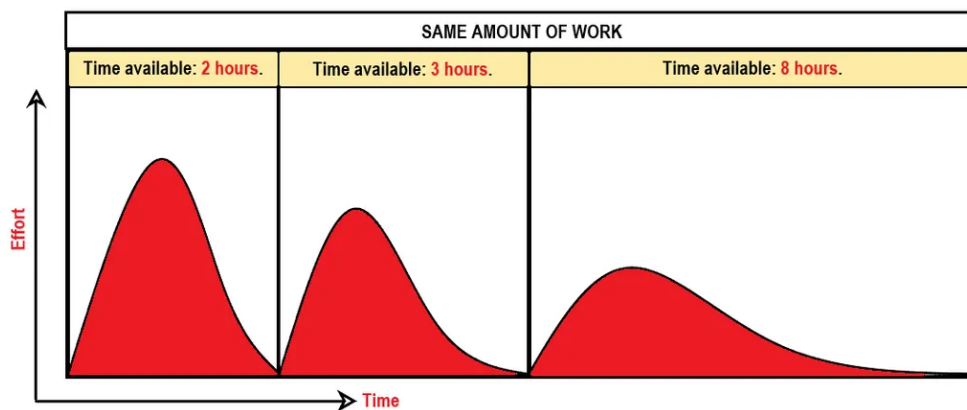


Figure 2. Parkinson's Law. Copyright: Consuunt (2021).

Every person has experienced or continuously experiences *Parkinson's Law* when attempting to complete a task. It is very common for students to end up studying or finishing an assignment during the night prior to the deadline, regardless of how early they started. Similarly, working professionals use all the time available for tasks their managers assigned them, regardless of how early they were assigned and how many meetings were involved in the process. However, this is not a particular phenomenon that happens among professionals and students, it is rather a phenomenon particular to the humans of modern society. Since our modern world is defined by deadlines and tasks to be done, it is very often the case that we use just as much time as available.

As previously described, an action is transformed into performance through *mens*, *corpus*, and *tempus*. None of the three pillars are equal to zero, and none are infinite. We require all of them to complete a task, but we underestimate their magnitude. In *Parkinson's Law* the misconception is the *tempus*. We fail to use the

time needed to solve a task, and instead make use of the time available. An economic inefficiency exists when the actual time employed in a task surpasses the required amount of time. Thus, it is an inefficiency to make use of more resources than just exactly the ones needed. In the original article by Parkinson, the law was meant to explain why the number of workers in public institutions continues expanding, while mostly the amount of work stays equal. Parkinson (1955) suggests that the increasing number of employees in an organisation would remain constant even if the work diminishes. Transferring this concept to personal productivity means that *Parkinson's Law* is an intrapersonal conflict.

Parkinson's Law seems like a mysterious force making work expand as much as an individual has time for something. In a vast amount of popular science literature *Parkinson's Law* is displayed as such a given force that we should be aware of, but without further explanation. For institutional structures Parkinson (1955) provides a credible solution of why the illusion of work expanding increases the amount of government officials. However, the explanation behind this law for personal productivity might be much simpler.

As explained before, Thaler and Shefrin (1981) modelled the problem of acting and doing as an organisation inside the individual that consists of two agents. If *Parkinson's Law* should govern the use of effort inside such an intra-organisation, then the problem of work expanding to fill the time available for a task is a problem resulting from the present bias. The *Doer* of now could make use of 100% of the resources needed for task completion, but since she knows there is still time available, she makes use of less than a 100% of resources. Resources in the form of effort. Logically, it follows that a task that is being performed with less than full capacities will get delayed over time. So why do individuals make use of all the time available? Well, that is because humans distribute their capacities and resources among time instead of among the work itself (see Figure 2).

The dilemma of *Parkinson's Law* is the *Doer* of now acting on the expense of the *Doers* of tomorrow. The challenge is that it requires a very informed *Planner* to account for the effort needed for a task, rather than assigning less than full capacities to comply with the deadline. Since this process happens automatically, being aware of this law suggests that an individual should plan less *tempus* to the work that is waiting for her.

Second. Parkinson's Law of Triviality.

The time spent on any item of the agenda will be in inverse proportion to the sum involved.

C. Northcote Parkinson (1957, p. 24)

The Second Law of Task avoidance is also named after Parkinson and was published by the author in his 1957 book: *Parkinson's Law, And Other Studies in Administration*. As a British naval historian, Parkinson identified in many of his publications the failures in organisational structures and behaviour with particular focus to public administration. Initially, his self-named set of laws were meant to explain the inefficiencies in bureaucracies, but two of them were particularly interesting for the field of software development and engineering, as well as later to the one of personal productivity. In this thesis the laws are cited as Parkinson wrote them but interpreted to expand the understanding of task-avoidant behaviour.

Parkinson's Law of Triviality arises from the idea that easy to understand tasks get more time, attention, and discussion in a meeting than complex and difficult activities. Parkinson noted that the time wasted (or invested) in a discussion during a meeting will depend on the sum involved, suggesting that *"the time spent on \$10,000,000 and \$10 [items] may well prove to be the same"* (1957, p. 32). \$10,000,000 adjusted to today's inflation is a sum too high for an average person to understand, while \$10 is a neglectable sum. It follows both items are under-discussed, while the trivialities in between grab all the attention. The example given in the 1957 book is from a fictional committee that approves a multi-million-pound project for a nuclear power plant within minutes but takes a few hours discussing the plan for a \$2350 budget for the bike to be used by the *"clerical staff"* (Parkinson, 1957, pp. 24-32). It follows, that the second item receives a disproportional amount of (wasted) discussion time.

In recent years, Parkinson's Law of Triviality has gained popular usage, initially among software engineers, one of who informally refer to it in an open email, which later led the law to be referred to as *Bikeshedding* (Turk, 2014)¹. *Bikeshedding* is used to refer to an act of overvaluing the importance of the trivial aspects of a larger or more complex task. Figure 3 is a simple framework taken from the internet to assess if the

¹ The email by Poul Henning Kamp to the contributors of an open-source operating system that popularized *Bikeshedding* can be found here: <https://www.bikeshed.com/> (Retrieved on June 27, 2022).

time spent on a particular sub-task classifies as *Bikeshedding*, which usually happens to be sub-tasks that are both easy and trivial.

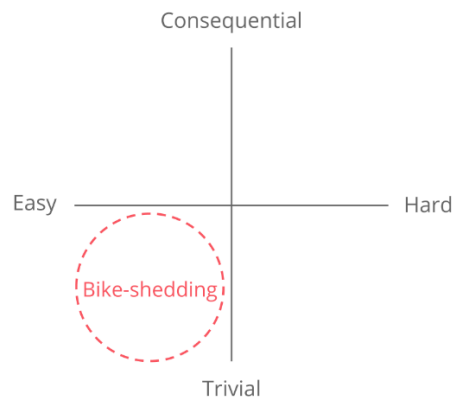


Figure 3. (Risk of) Bikeshedding. Copyright: Nuclino (2019)

The Parkinson's Law of Triviality in the context of personal productivity aims to describe how humans invest a disproportional amount of time on the trivial components of a task, while postponing or neglecting the work for the complex aspects of it. Students and scholars commit *Bikeshedding*, for example, when attempting to start writing a paper and instead of focusing on the content, they focus an unnecessary amount of time on the aesthetics of the document that will eventually wrap the paper, something that might be as well done after the task is finished.

Humans often face the action bias, which is the bias that refers to the situation when action is taken where no action is needed or where further action is even harmful. *Bikeshedding* on a personal level gives a person the feeling of acting, while no act is needed, and time is being wasted. *"There is nothing so useless as doing efficiently that which should not be done at all"* (Peter Drucker)².

Third. Law of Aversiveness of Effort.

Effort is costly and avoided ex-ante at all costs.

[Compilation] Ross (2010) & Inzlicht et al. (2018)

Economic models assume that agents are averse to effort, which means that effort represents costs and therefore it shall be minimized. Humans, like Econs, prefer

²Quote unverified. Retrieved June 27, 2022, from https://www.brainyquote.com/quotes/peter_drucker_105338

to avoid acting and therefore procrastinate their duties. It is not a surprise that it is preferable to consume *leisure*, which involves less costs in the form of effort, than it is to consume *work*. “*Procrastination is, in fact, evidence for the aversiveness of effort.*” (Ross, 2010, p. 29). The Third Law of Task Avoidance states that *Effort is costly and avoided ex-ante at all costs*. This third law is a compilation from the analysis of procrastination by Ross (2010), and by the study on The Effort Paradox by Inzlicht et al. (2018). These authors did not formulate a behavioural law, but they did present the theoretical foundation to include it as part of *The Laws of Task Avoidance* in this thesis.

Effort is costly refers to the energy needed to transform action into performance. The form of the effort might be physical or mental. Every action requires effort, even those that feel automatic or pleasurable. Econs are rational and minimize cost by default. Humans are due to natural selection in evolution cost minimizer agents. It is superior to not act than to act, it saves energy. The willingness to act lies in the reward. Rewards are incentives. If the Cost-Benefit Analysis, or better said, the (automatic) Effort-Reward Analysis is positive then a task gets performed, otherwise delayed, or postponed. The myopic, that is the short-sighted, view on effort is a what becomes the internal battle of procrastination, and what was earlier presented as *Picoeconomics* (Ainslie, 1992). “*If effort is assumed to be aversive, then procrastination expresses at least temporary preference for smaller immediate rewards over later larger ones.*” (Ross, 2010, p. 29).

Effort is avoided ex-ante at all costs refers to the idea that humans and animals when facing two or more options they will always choose *ex-ante* the one that involves the least effort. However, Inzlicht et al. (2018) suggest the Effort Paradox, which means that there are many activities that require more effort and that is what makes them valuable. A common example of this is the *IKEA Effect*, which refers to the “*increased liking of objects that people successfully assemble and build themselves compared with identical objects that come already assembled*” (Inzlicht et al., 2018, p. 338). Further examples include marathons, sciences fairs, and other recreational or educational activities people voluntary enjoy attending to and that involve investing more effort than it would be if not engaging in them. However, to avoid contradiction with the findings of Inzlicht et al. (2018) that *effort* can indeed be valued and desired by the individual seeking it, an assumption is needed.

The simple assumption is purely theoretical. Let's assume then that when someone is willing to invest high amounts of physical or mental effort, then the Effort-

Reward Analysis is positive, because the rewards from the activity are even higher than the invested effort. People taking part in very exhaustive sport activities will find the reward of goal achievement higher than the effort needed to achieve it. This assumption is included in the fourth *Law of Task Avoidance* when specifying “*ex-ante*” in *Effort is costly and avoided ex-ante at all costs*. Ex-ante means here that the individual perceives the activity as costly in relative terms to the options and therefore chooses to avoid the cost if possible. An individual aware that the effort is needed for high reward and is convinced about it will ex-ante see the activity low-cost and engage in it. In economic terms, this fourth law does not violate the Effort Paradox from Inzlicht et al. (2018) if we assume desired effort intensity activities have already been included in an individual’s calculation of rewards and efforts.

Fourth. The Parabolic Law of Effort.

Little and big tasks get delayed: Procrastination behaves parabolic in relation to perceived effort (relevance).

Hauff (2022)

The fourth *Law of Task Avoidance* is introduced in this thesis for the first time to the best of my knowledge and belief, and to be called *The Parabolic Law of Effort*. Nevertheless, the foundation for this behavioural law comes from the other three *Laws of Task Avoidance*, as well as the theoretical background from researchers in economics and psychology presented in the first part.

For the fourth behavioural law of this framework what has an impact on the level of procrastination an individual engages in is the level of perceived effort an action has. *Little and big tasks get delayed* means that we don’t enjoy acting when the tasks are too easy or perceived as irrelevant, nor when they are too complex or perceived as very relevant for us. Thus, we choose to delay. A big assignment due in one month feels like an important and too complex activity to start now without the proper dedication and, therefore it gets delayed. The salience cost of a big task is high. A little activity, such as washing the mug of coffee directly after using it feels irrelevant and with a low level of priority, therefore it gets delayed as well and more used mugs of coffee accumulate. Mental demanding activities or those that do not require much of our minds at all face the same problem as those involving the use of the body. Taking care of retirement might be an activity with little physical effort, but it does require a

huge amount of mental effort and time, therefore the perceived effort and relevance of the activity is too high to just start it right now without the proper dedication. There are many other examples where this is true. In fact, I happened to find it very difficult to falsify the parabolic course of perceived effort, which indicates that the following could be true: The highest proportion of procrastination goes to the little and the big tasks, and the tasks that are procrastinated the least have a relatively medium level of perceived effort in relation to the big and little tasks.

Procrastination behaves parabolic in relation to perceived effort (relevance) is presented visually in Figure 4 and formalized mathematically in Equation 1. The Y-Axis indicates the level of procrastination and the X-Axis the level of perceived effort a task is expected to demand to transform action into performance. The “relevant” in brackets means that perceived relevance might substitute perceived effort in some situations. Both Axes are in relative terms. The minimum of the function at coordinate point (1 | 1) implies that for humans a minimum level of procrastination is involved in every task. The point (1 | 1) is meant to represent the average individual. Further allocations with broader interpretations remain possible for future discussions within this framework.

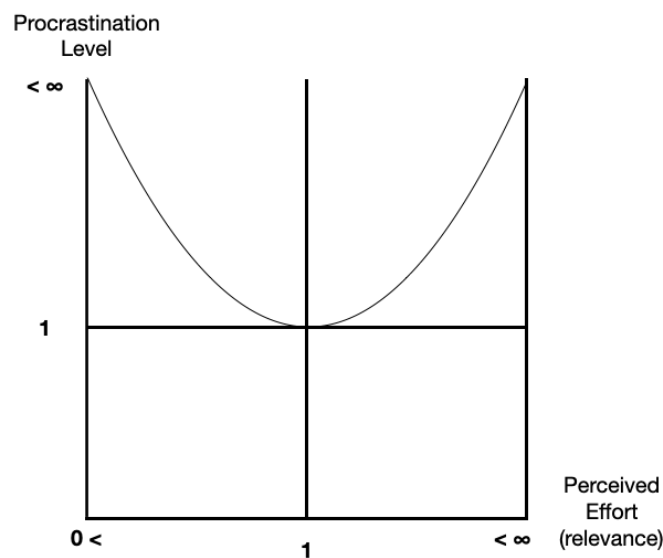


Figure 4. The Parabolic Law of Effort

$$\text{Equation 1. } y = (\alpha x - 1)^2 + 1$$

Alpha (α) is the *Laziness* factor that represents to what extend an individual procrastinates. Although *Laziness* might not be the most accurate terminology, I did

not want Alpha (α) to be confused with the salience costs or discount factor presented previously and commonly referred to in behavioural economics. The Greek letter Alpha (α) has been chosen for simplification purposes. Further meaning of the choice of this symbol are not in the scope of this thesis and remain open to the reader's interpretation.

Since *The Parabolic Law of Effort* only describes time as a single point and does not account for the future or the past, then the *Laziness* factor Alpha (α) might be the closest equivalent here to the degree of present bias. Present bias here designates the tendency of humans to value more the rewards in the present than those in the future. Table 5 presents the three different profiles an individual has in relation to her *Laziness* factor Alpha (α).

Table 5. The degree of *Laziness* in the factor α

<u>Type of individual</u>	<u>Form of the function</u>	<u>Mathematical expression</u>
Average performer	Standard parabola	$\alpha = 1$
High performer	Wide parabola	$0 < \alpha < 1$
Low performer	Tight parabola	$ \alpha > 1$

Result: *Laziness* (procrastination level) increases with α

4. How to fight the *instant gratification Monkey*

The first part of this thesis defined the boundaries and scope of the research and presented a comprehensive theoretical background on procrastination from an economic and psychologic perspective. The second part of the thesis introduced *The Laws of Task Avoidance* that make the fight against yourself so difficult. These *Laws* are like *gravity* for procrastination: they pull us from getting things done towards *Laziness*. However, just as it is possible that an airplane flies despite gravity, it is possible to win the battle against procrastination, but it does require some discipline. This third part of the thesis is divided into two sub-parts. The first one, presents an extension to the original model of Self-control by Thaler and Shefrin (1981). This extension includes new characters, such as the "*instant gratification Monkey*" (Urban, 2016). The second sub-part of this chapter presents a short and prescriptive guide to fight this intrapersonal battle, but more important, win the battle in real life as well, outside of the theoretical world of economic models.

4.1. An extended model of procrastination

As introduced in part one of this thesis, Thaler and Shefrin (1981) propose a model of Self-control that creates an imaginary world inside an individual where two agents play, in game-theoretical terms, against each other. They call these characters the *farsighted Planner* and the *myopic Doer*. Thaler and Shefrin (1981) develop a multi-character model of Self-control to account for the Agency Theory that is used to describe the moral hazard that occurs between managers, businesses, and co-workers inside an organisation. The extension proposed below is not meant to change the principles of the model by Thaler and Shefrin (1981). The idea is to expand the model to account for more characters that play against each other.

The agents of the (extended) *Pico-organisation*:

Agent 1 – The *Planner*

Agent 2 – The *Doer(s)*

Agent 3 – The *instant gratification Monkey* (Urban, 2016)

The behaviour:

Akrasia

The battle:

Hedonism vs. Utilitarianism

The model extension:

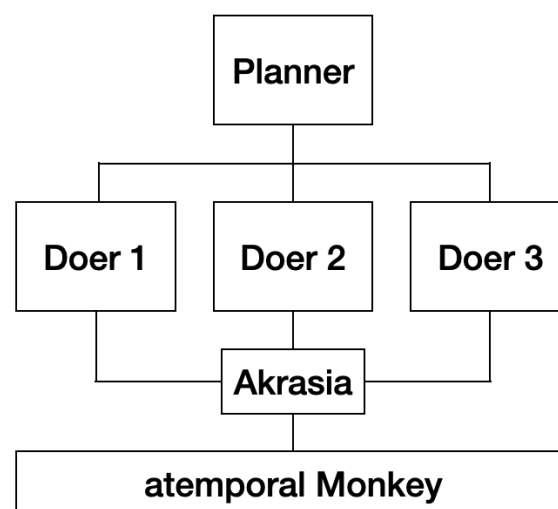


Figure 5. An extended model of procrastination based on Thaler and Shefrin (1981).

Figure 5 presents the model extension graphically and above it an overview of the agents, some of whom behave *akratic*, that play in it the battle between *Hedonism vs. Utilitarianism*. The idea is based on a multi-hierarchical organisation. The *Doers* are the agents responsible for acting here and now. They live across time, but only one at each moment in time. Thus, the *Doers* act “*diachronically*”, which results in a “*sequence of agents*” (Ross, 2010, p. 31). These *Doers* are part of a *Pico-organisation*, that is, an organisation that exists inside the self (reference: Picoeconomics by Ainslie, 1992). The particularity is that they follow the orders of two “Bosses”: the *Planner* (Thaler and Shefrin, 1981) and the “*instant gratification monkey*” (Urban, 2016).

The second “Boss”, the “*instant gratification monkey*”, is inspired by a TED Talk from 2016 by Tim Urban, which I will refer to only as the *Monkey*. Both the *Planner* and the *Monkey* are atemporal, which means they exist across time only once. This means, that they play “*synchronously*” as a “*community of agents*” (Ross, 2010, p. 31), which is the opposite of how the *Doers* play. Like in Thaler and Shefrin (1981) the *Planner* cannot act, as well, as the *Monkey*. That means the *Planner* can only *plan* and the *Monkey* can only *distract*. Only the *Doers* can act. All three characters exist in the Self, that means, they jointly are a (fictional) human decision maker.

The battle against yourself is the battle between Hedonism and Utilitarianism, which here means the battle between momentary pleasure and future results. Thus, the battle between rewards now or rewards later. The challenge the *Doers* face is the temptations of the *Monkey* that ultimately lead to an *akratic* behaviour. “*The akratic does what he believes should not be done or fails to do what he believes should be done*” (Owens, 2002, p. 382).

An impossible triangle of satisfaction results from the above presented extension: only two out of the three agents are aligned with an action. Only one pair can work together at the time: *Planner-Doers* or *Monkey-Doers*. There is a conflict of interest between the *Planner* and the *Monkey*. A theoretical solution is not intended in this thesis. This extension shall not increase complexity, otherwise it would be useless. This extended model intends to take the guilt of procrastination out of the *Present-self* and deposit it in the *Monkey*. In other words, you are not the problem, the *Monkey* is. The next sub-part intends to propose a short prescriptive guide to fight the *Monkey*.

4.2. A guide to fight the *instant gratification Monkey*

This final part intends to present some practical methods to win the battle against yourself. It is not the ultimate nor the most extensive practical solution. Instead, it is what shows all the learnings from this thesis also from a practical perspective. At the end, it is us who face procrastination, and not the fictional characters that live in the world of models.

4.2.1. The Three Pillars of Performance: *A practical approach*

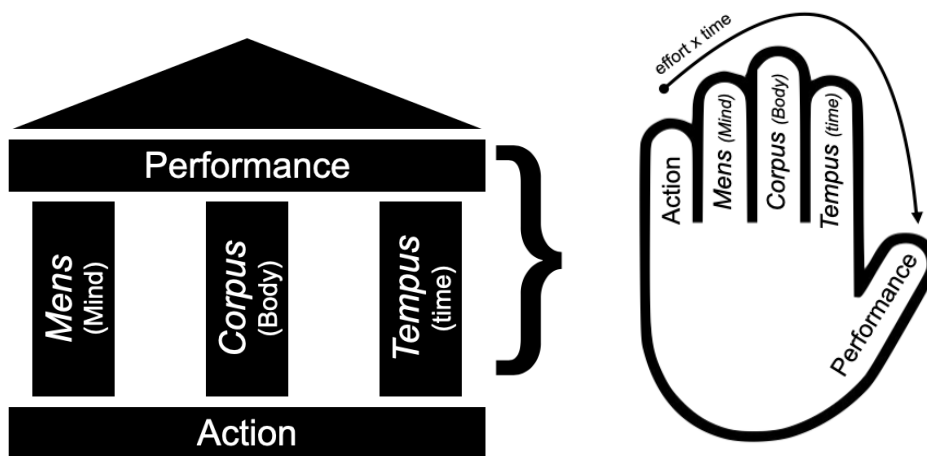


Figure 6. The Three Pillars of Performance: *A practical approach*

Figure 6 presents *The Three Pillars of Performance* from the previous chapter. The idea here is that the framework fits also in the palm of a hand. Whenever a task is in the “To Do List” take first a look at the framework. To transform action into performance time and effort are needed. If the problem or open task can be summarized in the palm of a hand it will be more likely that it gets done, since it is clear what resources are needed for it. For a deep explanation of this framework see the previous chapter.

4.2.2. The Triangle of Productivity and some methods to take advantage of it

From the previous simple framework, I derive *The Triangle of Productivity*. A quick look in the web browser will deliver many “triangles of productivity”. All of which, just as I try here, aim to explain the “only” three components needed for productive working. What characterizes mine is that it connects to *The Laws of Task Avoidance* as well as *The Three Pillars of Performance* to form from these three concepts a big

framework to assess, identify, and treat procrastination. The golden number appears to be 3.

Figure 7 presents this third framework. The three components of productivity are: Time management, Expectation management, and Accountability. The *First* and *Second* Laws of Task Avoidance, Parkinson's Law and Parkinson's Law of Triviality, get solved with a good system of time management. The *Third* and *Fourth*, Laws of Task Avoidance, Law of Aversiveness of Effort and The Parabolic Law of Effort, get solved with a good system of expectation management. All the Laws of Task Avoidance together put high pressure on the Self and decrease therefore productivity. Accountability is key to keep up productive and efficient work. As bounded rational beings, we benefit from deadlines and measurements self-imposed, but controlled by a third party. That is why consulting, therapy, and coaching are so popular disciplines.

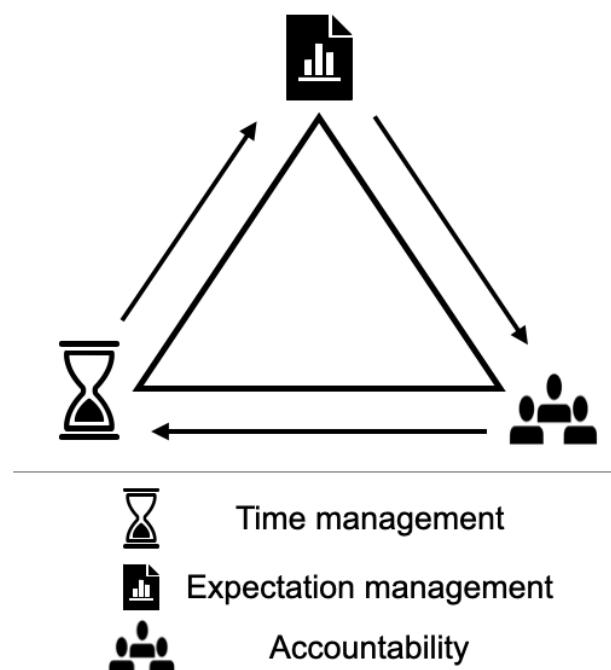


Figure 7. The Triangle of Productivity

4.2.3. Some methods to reduce procrastination

Above I presented *The Triangle of Productivity*. Below I briefly complement the narrative with one example method to improve Time management, Expectation management, and Accountability. Table 6 presents an overview of them. These three example methods combat procrastination. However, they are only the tip of the

iceberg. The purpose of them is to show how one practical method or technique combats the theoretical *Laws of Task Avoidance*.

Table 6. Example methods based on The Triangle of Productivity

<u>Time management</u>	<u>Expectation management</u>	<u>Accountability</u>
Pomodoro Technique	Eat that frog!	Precommitment & Group work

Pomodoro Technique (Cirillo, 2018)

This method was invented by Francesco Cirillo (2018) in a book named *The Pomodoro technique: The life-changing time-management system*. It is based on the intuition that time expands, and we get nothing done (exactly, Parkinson’s Law). The basic idea of the Pomodoro Technique is to improve time management by working in smaller periods of time with breaks in between. Since humans have a difficult time concentrating, dividing tasks into shorter periods of time increases the efficiency of work.

A good way to start is the Pomodoro Technique with the structure of time to work and breaks 25:5-25:15, or similar combination that considers small breaks in between rounds to work. This means work 25 min, rest 5 min, work 25 min, rest 15 min, and repeat the cycle. The second larger break is optional and needs also to be taken with care, since it might make you lose focus. A good time to start using this method is right now and a good tool to start with is your browser (example, <https://pomofocus.io/>).

Eat that frog! (Tracy, 2017).

This method has become very popular due to the book *Eat that frog!: 21 great ways to stop procrastinating and get more done in less time* by Brian Tracy (2017). In this publication Tracy (2017) explains in detail 21 different methods to win the battle against procrastination. It is a highly recommended reading to dive into the world of personal productivity and gain practical skills to fight procrastination. However, the title itself has gained a lot of popularity and has become a method for itself. In the words of the author: “If you have to eat two frogs, eat the ugliest one first” and “if you have to eat a live frog at all, it doesn’t pay to sit and look at it very long” (Tracy, 2017, p. 2). In a nutshell, start

with the most difficult task. The *Eat that frog!* method particularly applies to combat *The Law of Aversiveness of Effort*, since we prefer to avoid work, particularly the longest and hardest of our schedule.

Precommitment & Group work

Working with others might be one of the best ways to reduce procrastination. In fact, Koppenborg and Klingsieck found out that procrastination reduces among students when working together towards the same goal (2022). Working alone is not only boring, but it also lacks some commitment if the will power is not particularly strong. There are many techniques on group work, but one that also aligns with *The Triangle of Productivity* is finding an accountability partner who regularly checks the results. This method can be as easy as finding a group of people with whom to share objectives and metrics, or it can be more complex and follow the techniques of proven methods like Kanban or Scrum to get work done efficiently (for more information on agile working see <https://www.atlassian.com/agile>).

Lastly, precommitment might also mean staking money to improve the chances of performing good, particularly with the tasks that don't have to be delivered to anyone. StickK is a website that lets you set goals which results have to be proven by an external party and failing to "stick" to the goals causes the individual to pay the money that is at stake (see more at <https://www.stickk.com/>). Precommitment and group working are effective methods to combat *The Parabolic Law of Effort*, since this one implies different perceptions of work lead to increased levels of procrastination. By working in groups or staking personal money one avoids perceiving effort differently and starts noticing what is at risk.

5. Conclusion

Procrastination is a battle against yourself. It is an internal conflict of interest that is crucial to be resolved if progress and performance are part of your agenda. This thesis has introduced procrastination as an economic problem that can be analysed using economic methodologies. The first chapter, the theoretical analysis, built the foundation to create three different frameworks of behavioural laws and methods in chapters three and four, that I introduced as *The Three Pillars of Performance*, *The Laws of Task Avoidance*, and *The Triangle of Productivity*. The results of these laws are presented in chapter four as an extended model of procrastination as well as a

practical approach to this akratic behaviour. The value of this thesis is to expand the current and former literature on procrastination with three theoretical and practical frameworks that can serve for empirical and experimental research. The discussion is now opened, and it now is desirable and possible to expand these new methodologies and test them in the *real world* with humans.

“To deal more effectively with the ubiquitous problem of procrastination, researchers need to focus their efforts on the role of time in decision making” (Steel, 2007, p. 84). This project started as a methodological discussion inside the author’s mind about the meaning of time in economics. The discussion ultimately led to think about the impact of the thieves of time in our lives. I see the discussion and research on procrastination as one of the most relevant topics in social sciences. We are surrounded with external input in the form of technologies, advertisements, social media, online shopping, and other forms of time thieves. Understanding how this modern environment impacts our lives is fundamental to living the coming decades.

6. References

Ainslie, G. (1992). *Picoeconomics: The strategic interaction of successive motivational states within the person*. Cambridge University Press.

Ainslie, G. (2005). Précis of Breakdown of Will. *Behavioral and Brain Sciences*, Vol. 28 (5), pp. 635–650.

Akerlof, G.A. (1991). Procrastination and obedience. *The American Economic Review*, Vol. 81 (2), pp. 1-19.

Boyer, P. (2008). Evolutionary economics of mental time travel?. *Trends in cognitive sciences*, Vol. 12 (6), pp. 219-224.

Cirillo, F. (2018). *The Pomodoro technique: The life-changing time-management system*. Random House.

Grant, A. (2017). Fools Rush In (Chapter 4), in *Originals: How non-conformists move the world* (pp. 92-113). *Penguin*.

Inzlicht, M., Shenhav, A., & Olivola, C. Y. (2018). The effort paradox: Effort is both costly and valued. *Trends in cognitive sciences*, Vol. 22 (4), pp. 337-349.

Klingsieck, K. B. (2013). Procrastination: When good things don't come to those who wait. *European Psychologist*, Vol. 18 (1), pp. 24-34.

Koppenborg, M., & Klingsieck, K. B. (2022). Group work and student procrastination. *Learning and Individual Differences*, Vol. 94, 102117.

Loewenstein, G. (1996). Out of control: Visceral Influences on Behavior. *Organizational Behavior and Human Decision Processes*, Vol. 65 (3), pp. 272-292.

O'Donoghue, T., & Rabin, M. (2001). Choice and procrastination. *The Quarterly Journal of Economics*, Vol. 116 (1), pp. 121-160.

Owens, D. (2002). Epistemic akrasia. *The Monist*, Vol. 85 (3), pp. 381-397.

Parkinson, C.N. (1955, November 19). Parkinson's Law. *The Economist*. Retrieved on May 19, 2022, from <https://www.economist.com/news/1955/11/19/parkinsons-law>

Parkinson, C.N. (1957). *Parkinson's Law, And Other Studies in Administration*. Houghton Mifflin.

Ross, D. (2010). Economic models of procrastination. In Andreou, C. & White, M.D. (Eds.), *The thief of time: Philosophical essays on procrastination*, pp. 28–51. Oxford University Press, New York.

Rozental, A., Forsström, D., Hussoon, A., & Klingsieck, K. B. (2022). Procrastination Among University Students: Differentiating Severe Cases in Need of Support From Less Severe Cases. *Frontiers in Psychology*, Vol. 13, Art. 783570.

Steel, P. (2007). The nature of procrastination: a meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, Vol. 133 (1), pp. 65-94.

Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, Vol. 89 (2), pp. 392-406.

Tracy, B. (2017). *Eat that frog!: 21 great ways to stop procrastinating and get more done in less time*. Berrett-Koehler Publishers.

Turk, M. (2014). Fostering Collaborative Computational Science. *Computing in Science & Engineering*, Vol. 16 (2), pp. 68-71.

Urban, T. (2016). *Inside the mind of a master procrastinator* [Video]. TED Conferences. Retrieved on June 29, 2022, from <https://www.ted.com/talks/tim-urban-inside-the-mind-of-a-master-procrastinator>

Other References

Figure 2.

Consuunt (2021). Parkinson's Law in Time Management. Retrieved on June 20, 2022, from <https://www.consuunt.com/parkinsons-law/>.

Figure 3.

Nuclino (2019). Bike sheds and ducks, or why most design review meetings are time wasters. Retrieved on June 27, 2022, from <https://blog.nuclino.com/bike-sheds-and-ducks-or-why-most-design-review-meetings-are-time-wasters>.