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**Radical life extension and human motivation:
Would we lose our motivation if we could live forever?**

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Abstract

When evaluating the desirability of radical life extension, one of the worries which is often given, but which has so far received minimal amount of critical attention, is that an indefinite life span would have a negative impact on our motivation. As a result, we as individuals and as societies would come to a standstill. I will here examine the reasons for this belief, I will analyze human motivation and attempt to understand how ageing and death influences our motivation, in order to evaluate whether this fear is misguided or not. I come to the conclusion that, while there are legitimate risks to be taken into account regarding human motivation, overall, considering the potential benefits that such a change could also bring, these risks are insufficient to render the pursuit of radical life extension undesirable.

INTRODUCTION

The year is 2014. Two hundred years ago, humans were about to discover cholesterol and invent the stethoscope and life expectancy at birth in France was about 40 years old¹; in 1814, doctors performed the first indirect blood transfusion, conceptualized the first artificial kidney and marketed the aspirin, and French people could on average expect to live into their 50s. Today, as life expectancy in France is now 82 years old, our genome has been sequenced and our brains are being mapped. Ever since the beginning of modern science, all of these medical and technological breakthroughs contributed to extending life expectancy as the result of more immediate goals (diagnosing an illness, healing an injury, understanding the brain, etc.) but they were all motivated by a common, overarching goal: not die.

Or rather: stay alive, and do so for as long as possible. This is why people take interest in life expectancy, to know more or less how much time they can expect to live if they take care of themselves. But life expectancy is a misleading concept, because it is an average taking into account infant mortality and susceptibility to diseases. When we say that life expectancy in the Middle-Ages was around thirty years old, this doesn't mean that the human body could not stay alive for much more than 30 years. It just means that the living conditions were causing the death of many people at a young age. If you didn't die young and didn't fall ill later in life, you could very well be a middle aged man in the Middle-Ages, or yet live into your 80s as many people do today. Obviously, social environment and wealth played a great part on an individual's life expectancy: the life expectancy of English aristocrats in the 13th century was 64 years old, and then 71 years old in the 16th century. Today, the WHO lists Japan as having the highest life expectancy on Earth, with 83.7 years on average.

But what about the maximum possible lifespan people can hope to live to? The oldest recorded person to have ever lived was a French lady called Jeanne Calment, who died in 1997 aged 122 years and 164 days. Is this the maximum? Some scientists argue that theoretically there is no limit²: "The premise stating that the maximum human life span is fixed was justified, [but] it is invalid in a number of animal models and... is likely to become invalid for humans too." Indeed, death is the consequence of only three types of causes: senescence, disease and trauma. If we stop the degenerative aging process, if we manage to treat and/or prevent diseases and if we avoid all physical and mental trauma, then theoretically nothing prevents life from going on indefinitely.

¹Life expectancy figures in this chapter come from INED (Institut National d'Etudes Démographiques).

²GAVRILOV, L. A.; GAVRILOVA, N. S., *The Biology of Life Span: A Quantitative Approach*, Starwood Academic Publishers, 1991

Although the question of mankind's relationship to death has always preoccupied philosophers, it has enjoyed a strong resurgence since the end of the twentieth century. Indeed, the development of science and technology - with breakthroughs particularly in nanotechnology, biotechnology, information technology and cognitive sciences (NBICs) – has forced philosophy and ethics to ponder the very serious possibility that humans could take control of their own biological evolution and perhaps conquer mortality. This prospect has become a fertile ground for philosophy, giving rise to many currents such as transhumanism dealing specifically with issues related to the potential transcendence of the current human condition. Common topics relate to the augmentation of physical and mental abilities, the fusion of body and machine, artificial intelligence, cloning and cryonics; these subjects that were once science fiction lie at the heart of serious philosophical debate among prestigious think tanks such as the *Future of Humanity Institute* of Oxford University, led by the philosopher Nick Bostrom. More importantly still, this goal is the subject of serious research and investments: in 2013, Google founded Calico, a biotech company dedicated to combating ageing and associated diseases, whose chief engineer Ray Kurzweil, the self-proclaimed prophet of singularity³, claims that humans will be able to live forever as soon as 2045. Meanwhile, research institutes such as SENS are gaining credibility and broadening their outreach in their anti-ageing research. According to Aubrey de Grey, founder and director of SENS, “the first human being to live 1000 is already born.” Between Nick Bostrom the avant-garde philosopher, Ray Kurzweil the visionary engineer and de Grey the prophet scientist, transhumanism is slowly gaining traction in the public debate and opening up the conversation about humankind's relationship to death. The big question now is not so much whether it is *possible* for humans to transcend mortality, but whether they *should*.

The debate about radical life extension tends to focus on two general kinds of issues: the first pertains more to applied ethics, focusing on the means employed to achieve the ends. This leads to conversations about which technologies are used, experimental protocols and procedures, priorities in allocating public funds for R&D, economic challenges caused by the cost of treatments, etc. All these questions relate to the conditions for successfully achieving the goal, not the validity of the goal itself. In other words, this part of the debate is asking: can humankind radically expand its lifespan, and if so, are the means to do so ethical?

The second pertains more to normative ethics, concerning itself this time more with the ethics of the ends themselves, forcing us to question whether or not they are good and justified with regard to their inherent values and consequences. Is the post-human condition, where life

³ Singularity is a hypothesis that at some point in humankind's technological advancement, a breakthrough will abruptly trigger a leap in technological growth so large that it will change the human condition beyond anything we can predict, and possibly allowing humans to fully control their evolution as well as their physical and mental abilities.

has been radically extended, a desirable condition? The current paper will be set in this side of the debate.

Two common objections to radical life extension fall partly into this category: first, the appearance of two distinct casts of humans, those who have the resources to extend their lifespan and those who don't; and second, overpopulation. But although these two objections seem to question the ends, they are in fact still arguments made against the means. They aren't saying that radical life extension would be bad for humans *per se*, they're saying that we couldn't achieve radical life extension in suitable conditions for everyone. If radical life extension could be achieved without causing greater injustice or overpopulation, then the question remains: is an indefinite lifespan a desirable condition for humans?

Here is where the true normative objections can be made against radical life extension with regards to the effects it would have on the human condition itself. For instance, we could fear that with an indefinite lifespan, we wouldn't enjoy anything anymore. Philosophy and literature is infused with this idea that finitude is irreducibly constitutive of the quality of experience and ultimately indispensable to a happy life. We wouldn't enjoy opportunities if they weren't impermanent, we wouldn't love other people so much if we weren't certain of losing them one day and we wouldn't enjoy our activities as much if they could last forever. An indefinite life would be bland, tasteless and depressing. Another common objection concerns the progress and renewal of society: if the same people lived on indefinitely, populations wouldn't allow younger generations to grow and introduce innovative ideas into society. Civilizations would stagnate.

These arguments have been the subject of in-depth conversation in classic and contemporary philosophy, with transhumanists in particular spending a great deal of time analyzing rebutting them. However, there is one objection to radical life extension that is common in conversation but that hasn't received the same amount of careful attention in the literature, and that is: if we were to live potentially indefinite lives, we would lose the will and motivation to do things. Death, for several reasons, would constitute a necessary engine for human action, without which humanity would come to a standstill. The same fear can be applied to varying degrees to the disappearance of other biological deadlines that would presumably be affected in a post-human world, such as the loss of fecundity or the weakening of physical and mental abilities with old age. It is this objection – the loss of motivation – that we will take a closer look at here.

One of the reasons why this question hasn't to my knowledge been more exhaustively analyzed is because it is often conflated with the other main objection made to radical life

extension previously alluded to: that impermanence is necessary for life to be enjoyable. As soon as people talk about will or motivation, the conversation quickly shifts into a debate about the value of experience, presumably because we assume that the main motivation for acting is our interest in things. While this is generally true, I believe the motivation to act and the value of the action are distinct enough to warrant a more separate analysis. Indeed, whether or not impermanence affects the significance and quality of a given experience does not equate to whether or not it has the same effect on the agent's motivation to realize that experience. By studying the two questions separately, we can dive deeper into the specifics of motivation and perhaps shed light on new findings that can be useful to the broader debate. However, I should mention that I'm making this separation here only to better define the object of my study, but it is of course not a strict divide; obviously, the quality of a given experience will inform our motivation to act. We will come back to this more specifically when we talk about the risk of weariness and boredom.

From an academic perspective, the issues surrounding a post-human condition are particularly stimulating for a young philosopher insofar as they deal with some of the most pressing philosophical questions of our time and invite us to truly engage in a thought process that is necessary for the future of humankind. Death has been a central preoccupation for philosophers throughout human history, but the modern context has thrust the conversation to a whole other level due to the magnitude of the possible changes that lay ahead. And although some transhumanist prognostics can often seem (and often surely are) overly optimistic, there's no reason to believe the march of progress will intentionally stop. Given that the future is long and open enough for these predictions to eventually materialize, I believe that it is not premature to seriously think about these potential transformations for it is right now that we can properly set the conditions for implementing them. As neurobiologist Jean-Didier Vincent astutely warns:

“I strongly believe that we should not underestimate the transhumanist movement. This is not a group of sects, nor a utopian movement. This is a movement that has great financial and intellectual resources. It is necessary that France, a leading country in neuroscience with a very rich structure of ethical reflection, doesn't get left behind on these matters.”⁴

It is this sense of social concern that drives me to undertake this study, with the hope of shedding some light on a darker corner of the conversation as we prepare for the future.

⁴ VINCENT, J-D, « Hypothèses sur l'avenir de l'homme », *La pensée de midi*, 2010/1 (n°30), Actes sud, pp. 42-50

Furthermore, my original interest in pursuing this research will partly explain my approach. For several years, my personal intuition is that we should support radical life extension. I know this is my intuition because when confronted with the prospect of an indefinite lifespan, my immediate gut reaction isn't one of fear or rejection, but one of curiosity and excitement. The pitfalls and risks appear to me only after this initial instinct calms down. And it seems to me important to clearly reveal this original bias because it explains the way in which I am approaching this study: the fears and objections people make in response to radical life extension naturally surprise me because they contradict my intuition, and so the whole purpose of this paper is for me to figure out whether or not I have reason to feel this way or not. My experience working in bioethics⁵ has trained me to not to blindly trust my affective inclinations, to value truth over personal preferences, and so I am doing this research in order to test the resilience of my intuition against the strongest contradictions, in order to see if it still holds.

In this paper I will attempt to answer the following question: if humans could extend their lifetime indefinitely, are there reasons to believe that there would be a radical loss of motivation? In other words, is death necessary to human motivation? For now, this is still a question that begs many others. The first chapter (I) will provide some context and specify in greater detail what we are talking about.

Then we will look at why people fear a loss of motivation. Why do we think that with an indefinite lifespan, we'd lose all will to act? What kind of motivation are we talking about? What kinds of behaviors, exactly, are we afraid of losing? And what does this reaction say about our current attitudes and values regarding motivation and effort? We'll also have to analyze the psychological underpinnings of human motivation: what is motivation and what elicits it? More importantly, we will look at the temporal aspect of motivation and study how the perception of time can influence our behavior, and then seek to apply this to the particular instance of death. What kind of temporal effects does death have and how does it contribute to human motivation? And then, based on these findings, we'll hopefully have enough information to see whether or not the disappearance of death, or at least of some of its core characteristics, would negatively and significantly alter human motivation.

The general argument that we shouldn't pursue radical life extension because of a loss of motivation rests upon three core reasons that this paper will be structured around. The first and most general one is what we'll call "the loss of purpose" (II) and the argument goes like this: death motivates all of human behaviors to some degree, in the sense that all behavior is aimed at

⁵ In 2012/2013, I worked for the French Government as assistant to Michel Doucin, the French Ambassador for Bioethics, as well as heavily involved with the activities of the International Association for Law, Ethics and Sciences (IALES).

avoiding it (farming, building, clothing, etc.) or surviving it (procreation, religion, art, etc.), therefore if death is no longer a pressing part of our future, then all these behaviors would lose their purpose and therefore our motivation to engage in them would disappear.

The second and most intuitive reason is what we'll call the "loss of pressure" (III): given that death is the ultimate deadline to all possibilities, it pressures us into acting sooner rather than later and so if we were to enjoy an indefinite amount of time ahead of us, we would lose this temporal pressure to act and therefore fall into a perpetual procrastination.

Finally, the third reason to fear a loss of motivation would come as the result of boredom. The claim is that if we had an indefinite amount of time to do everything, we would inevitably end up doing everything over and over again, leading to a general boredom that in turn would make us all completely lazy. As such, this third category would attribute the lack of motivation to a "loss of interest." (IV).

Before going any further, it is important to point out that in such conversations about future states of the world, there is an irreducible element of uncertainty and speculation. A study on the possible psychological effects of an infinite life reminds us of this caveat:

"Why should empirical data about human behavior in the mortal life be of any relevance to human behavior in an immortal life? The change of conditions and circumstances could make an important difference to the quality of human experience. [...] The psychological evidence [...] is informative about how humans are likely to behave, but because the data concern mortal beings, they can be only a tentative guide to the experience of [...] the immortal life."⁶

If we're trying to make claims about the impacts of a potentially infinite lifetime on future human beings who could be so radically different to us given their particular condition, based on conceptual tools and findings that were formed in a world where death has always been a fundamental factor in all human activity, we have to tolerate some degree of extrapolation, speculation and intuitive reasoning. It may be impossible for us today to correctly foresee what such a post-human life would be and accurately predict all of its positive and negative consequences for the people living it. All we can do is reflect on how such a change may affect us, as we are today, and that's reason enough to pursue such a study, because our best efforts will be valuable to inform the conversation today and help prepare those who may experience the transition tomorrow.

⁶BORTOLOTTI, Lisa, et NAGASAWA , Yujin, *Immortality without boredom, Journal compilation*, Blackwell Publishing Ltd, 3 September 2009, p.276

II – Preliminary remarks on what we mean by “post-human condition” and “human motivation”

A – Defining the post-human condition

Before we get into the analysis of how a potentially indefinite lifespan would influence human motivation, we have to be clear and what we mean by “potentially indefinite lifespan.” Does this mean living on forever? Does it mean living like today, in a human body? Does it mean just being older for longer?

When people say that they want to “live forever,” this is often a misguided expression, because strictly speaking, life isn’t what people want (or at least this is what I’m going to assume henceforth). What they really want is a potentially infinite continuation of their conscious self, which requires allowing consciousness to exist in a body that can host consciousness. We know the human body can do this and so far it is the only place we can find our own subjective consciousness. Unfortunately, our bodies wear out quickly.

As an escape to this, some claim that consciousness could exist digitally in a whole brain simulation that could presumably continue indefinitely. Digital consciousness is not an option I will be exploring here, for several reasons. First, so long as we aren’t able to objectively establish the presence of subjective consciousness, any project of mind transfer will entail an element of uncertainty and require, on the part of the person hoping to be transferred, a leap of faith. So unless we can somehow resolve the risk of just creating a copy of ourselves in the digital world, people will play it safe and want to continue in their bodies, where the continuation of the physical integrity of their brain is the best guarantee of a continuation of their strand of subjective consciousness. Second, most people won’t want to give up their “physical body” to become digital auras anyway. If anything, what makes radical life extension appealing is the ability to continue experiencing life as we do today, with a body that can move in space, feel sensory information and interact with other bodies. That doesn’t mean that a digital consciousness wouldn’t be able to recreate this richness of experience: our “digital self” could be controlling a real-world body-machine surrogate or even exist in an entirely fabricated matrix-like simulation with a recreated, sensory body. But this just brings me back to my point: we would want to be incarnated in a body, in order to continue living a form of life that is somewhat relatable to the one we know now.

While a matrix-like simulation could indeed recreate this (who knows, we may already be in one), I don’t believe it’s an option worth exploring here: if we incarnated our digital minds into

digital bodies in a simulation that looks and feels exactly like ours, and we coded our bodies to stay young and healthy, why wouldn't we just go further and add in a "death cheat-code" so that if you step in front of a speeding truck, it goes right through you and all you get is a notification that in real-life you'd be dead? Perhaps we would, and if we did, why even have roads and cars? Why not code ourselves to fly, or just teleport for that matter? We can go on until we remove everything that makes up our current real world and all that is left are conscious auras floating in a digital blank page. The matrix-like simulation would ultimately bring us to one of two scenarios: either it would be like the real-world and we wouldn't be aware that we're in a simulation, in which case we're back to the experience of the real-world as we know it today and the discussion below will apply. Or we *would* be aware of the simulation, in which case we would truly be immaterial auras just enjoying the experience of an inconsequential playground. But this forces us to consider the experience of disincarnated immaterial forms of subjective consciousness, which I believe is far too removed from anything we can relate to for any useful work to be done here.

So given all these reasons, I will focus my study on a post-human world where we continue living indefinitely in a healthy biological body with a sane mind. This would mean that through a combination of various techniques (genetic modification, biotechnologies, improved medicine, etc.) we could control the evolution of the body and maintain it in optimal condition. This would be determined based on a series of factors (fertility, strength, cell reproduction, etc.) and what we consider to be an optimal body may come to change, but let's assume that so long as we can distinguish a healthy body from an unhealthy one, we will know what to aim for.

I'm aware that this is only one of many different avenues in which radical life extension could happen. We could imagine, for instance, a world where instead of living on indefinitely in an optimal body, science allows us stretch the duration of existing biological cycles, like a rubber band that we would stretch. As such, childhood, adulthood and old age would all proportionally be longer, and all the current biological deadlines would still be unavoidable and irreversible. I'm not taking this option into account either for two reasons: if on the one hand the stretching of the lifespan is relatively small-scale (say, we added a few dozen years to each and lived an average 150-200 years), then life would be fairly similar to what it is today and would only require readjusting our habits (people would retire in their 120s instead of their 60s, for instance). This shift may certainly affect human motivation in certain ways, but presumably not enough to bring everyone to a halt. If, on the other hand, the stretching was much greater (say several hundred years longer), then while we may enjoy more "healthy years," we'd also face more years of old age. And this is not something that most people, or society as a whole, will want. If such a "lifetime stretching" was to occur, then people would quite surely feel it is worth it for the years

of healthy life gained (a study showed that people prefer adding years to their life even if their quality of life goes down⁷) but the period of old age would be met with resistance and quite possibly be treated differently, in order to cut it short or simply not prolong it. Indeed, the kind of radical life extension I'm considering will only be deemed acceptable if it means a radical extension of healthy life. People don't just want to add years to their life, but to add life to their years.⁸ So, assuming that in a "lifetime stretching" configuration, healthy people can live a lot longer and then old age isn't prolonged, we would find ourselves in a fairly similar situation to the post-human world I have described above. The big difference would be that in this case, death would be a far more present factor and therefore human motivation would be less impacted; in other words, whatever findings we make by considering the post-human world I have described can be assumed to apply here too.

Coming back to the post-human world I am contemplating, it is important to remember one essential aspect of it: living a potentially indefinite life does not mean immortality. Death will always be possible. A human body will always remain vulnerable to accidents, or to a new disease, or to violent behavior. This is why we will never talk about "immortality" or "living forever" but rather speak of "a potentially infinite lifespan" or "living indefinitely." Death will not be a fatality, but an accident; not a rule but an exception; not the norm but an error. But it will always be possible, and so life will never be infinite.

Even though, given the timescales we are talking about, it's quite possible that we would feel as though we were living infinite lives. Philosopher John Harris⁹ made an interesting prediction about the life expectancy of a post-human who would still be subject to the accidents of life. By extrapolating the life expectancy of 12-year-olds (in the USA in 2002) who are old enough to not die from childhood diseases but young enough to not be subject to senescence, he estimated the post-human life expectancy at 4986 years; at that rate, 1 in every 1000 individuals would live to be 10 000 years old. Imagine if today people could expect to live a healthy life for 5000 years or even, let's say, 1000 years, there's a strong chance that perceptively, they would think they could live on forever. This may not be true for some distant future world where centenarians cross paths with millenarians, because people's appreciation of time might adapt such that living only 1000 years of life will seem unjustly short. But again, this is too far removed to discuss accurately.

⁷WEISS, K. M. « The biology of ageing and the quality of later life », dans *Ageing 2000: Our Health Care Destiny*, ed. C. Gaitz and T. Samorajski, Springer, 1985

⁸Cette formulation est la traduction d'une expression qui se trouve employée de manière récurrente dans les textes anglo-saxons dédiés à l'augmentation radicale de l'espérance de vie, et dont l'origine est difficilement attribuable. Une version typique de cette expression est la suivante: *Radical life extension is not only about adding years to life, but adding life to years.*

⁹HARRIS, John, *Enhancing Evolution: The Ethical Case for Making Better People*, Princeton University Press, 17 octobre 2010, 242 p., p.69

To recap, then, whenever I talk about the “post-human world” or “post-human condition,” I will be referencing a world where humans can control the biological evolution of the body in order to indefinitely maintain it in an optimal condition, and in which death remains a potential hazard.

B – Remarks on human motivation

Seeing as the central subject of this paper is motivation, I think it’s necessary that we define it correctly: according to Campbell and Pritchard, “motivation is inferred from the direction, level, and persistence of effort in one’s task activities.”¹⁰ A more complete definition is given by Fabiel Fenouillet,¹¹ professor of cognitive psychology, who defines motivation as a hypothetical intra-individual force that can have multiple internal and/or external determinants and that can explain the direction, initiation, persistence and intensity of a behavior or act. It is important to make the distinction between motivation – a hypothetical internal phenomenon – from its determinants that can be internal but also external: for instance, if the threat of a punishment (external determinant) can explain a student’s change in attitude, it doesn’t describe the nature of the internal force (motivation) that drives this change. The threat must be received and translated internally, into fear for instance, or shame or anxiety, to account for the nature of this internal force that brings about the change in behavior.

With regards to the three big motivational reasons identified against radical life extension, the basis for the motivation will be different and the role that biological deadlines such as old age and death will also vary: if we fear a loss of purpose, it is because humans are animals whose primary purpose is to stay alive and death is an external determinant that causes an existential fear insofar as it threatens to end life.

If we fear a loss of pressure, it is because for all possible acts, people can be moved by a variety of feelings that breed more or less inherent motivation, and can therefore find themselves really not wanting to do the act or really wanting to do it. In between these extremes, the strength of our motivation can vary depending on other determinants, such as deadlines that cause time pressure. In this case, old age and death are external determinants that need to be internally processed as a perceived pressure in order to influence motivation.

Finally, if we fear a loss of interest, it is because we are usually motivated to do the things that interest us and that, in a potentially infinite lifetime, we would lose this interest. Death here

¹⁰CAMPBELL, J. and PRITCHARD, R. (1976) ‘Motivation Theory in Industrial and Organizational Psychology’, dans M. DUNNETTE (ed.) *Handbook of Industrial and Organizational Psychology*, Rand McNally, 1976, pp. 63–130.

¹¹<http://www.lesmotivations.net/spip.php?article10>

would not be an external determinant of motivation itself, but an external determinant of the activities themselves that would prevent our inherent motivation from running out.

II – A loss of motivation because of a loss of purpose

There is little doubt that a post-human world would cause an extraordinary transformation of human society as we know it today; indeed, for all of human history, death has been a constant and served as an “engine for civilization.”¹² If that engine disappeared, would civilization grind to a halt?

A – Death as an engine giving purpose to our actions: the quest for immortality

The bottom line here is that humans are living organisms and that therefore they have one basic objective: to stay alive. This is what life is about and underlies almost everything in accepted science, from Darwin’s biological evolution to social interaction. Richard Dawkins describes living beings as “survival machines,”¹³ agreeing with the sociologist Raymond Gastil who claims that “all life forms behave as though their continuation in the future – immortality – was the essential goal of their existence.”¹⁴ This basic drive is the foundation for an important motivational theory called terror management theory (that I will come back to in a moment) that highlights the inherent contradiction of the human condition:

“Although humans share with other forms of life a basic instinct for self-preservation, they are unique in their possession of intellectual capacities that make them explicitly and painfully aware of the inevitability of their mortality. Because of this juxtaposition of animal instinct with sophisticated intellect, humans must live with the knowledge that the most basic of their needs and desires ultimately will be thwarted.”¹⁵

Indeed, humans are doubly driven to stay alive: their whole organism is primed for survival, and their brains give rise to a conscious desire for their continued existence. But because that consciousness includes the awareness that death is an unavoidable end, we live in a constant state of anxiety and failure. At the same time, we are incapable of truly conceiving what death implies, this complete state of non-existence, a total void. Nothing is, nothing ever was and

¹²CAVE, Steven, *Immortality: The Quest to Live Forever and How It Drives Civilization*, Crown; 1ère édition, 3 avril 2012, 338 pages, p.22

¹³DAWKINS, Richard, *The Selfish Gene*, Oxford University Press, 30th anniversary edition 2006, p.21

¹⁴GASTIL, Raymond, cite dansCAVE, Steven (2012) *Op. Cit.*, p.17

¹⁵PYSZCZYNSKI ,Tom, GREENBERG, Jeff et SOLOMON, Sheldon « Why Do We Need What We Need? A Terror Management Perspective on the Roots of Human Social Motivation », *Psychological Inquiry*, Vol. 8, No. 1 (1997), pp. 1-20; p.2

nothing will ever be again; in fact, even the idea of “nothing” doesn’t exist. It is the prospect of this “unavoidable void” in the context of a biological instinct and a conscious will to stay alive that causes what Stephen Cave calls “the Mortality Paradox,” claiming that “its resolution is what gives shape to the immortality narratives, and therefore to civilization.”¹⁶

These immortality narratives he’s referring to are four possible avenues humans have identified in their quest for immortality: to stay alive (biological survival), to resuscitate (this survival implies that death is not irreversible), to have an immortal soul that can live on without the physical body (spiritual survival) and finally to leave a legacy (symbolic survival). According to Cave, humankind’s desire for immortality, expressed through these four paths, is the main reason for all of our behavior and social constructs.

For instance, biological survival (the first path) is surely the reason why humans first banded together as tribes, and this justification has basically been carried through all the way to modern societies. As Cave puts it:

“A civilization is a collection of life-extension technologies: agriculture to ensure food in steady supply, clothing to stave off cold, architecture to provide shelter and safety, better weapons for hunting and defense, medicine to combat injury and disease.”¹⁷

But despite their best collaborations, each and every individual conscious being knows that these efforts will one day be in vain, and so they also seek other ways to survive death, thus explaining the presence of the other three paths to immortality and thus almost everything that makes up a civilization:

“This seeking—this will to immortality—is the foundation of human achievement; it is the wellspring of religion, the muse of philosophy, the architect of our cities and the impulse behind the arts. It is embedded in our very nature, and its result is what we know as civilization.”¹⁸

¹⁶CAVE, Steven, *Immortality: The Quest to Live Forever and How It Drives Civilization*, Crown; 1ère édition, 3 avril 2012, 338 pages, p.22, p.17

¹⁷*Id*, p.29

¹⁸*Id*, p.1

Everything we do can be interpreted as an attempt to live on indefinitely. This is where terror management theory (or TMT), developed by Jeff Greenberg, Sheldon Solomon and Tom Pyszczynski, translates this lust for survival into a motivational theory:

“The most basic of all human motives is an instinctive desire for continued life, and all more specific motives are ultimately rooted in this basic evolutionary adaptation. [...]”¹⁹ They continue: “The self-preservation instinct - the goal of staying alive - is the superordinate goal toward which all behavior is oriented. All other motives are, in one way or another, derived from and subservient to this “prime directive”.”²⁰

TMT argues that humans deal with their fear of death by two distinct but complimentary mechanisms: on the one hand by holding onto a system of a culturally shared set of beliefs (a cultural worldview), which are “a set of benign concepts for understanding the world and one's place in it, a set of standards through which one can attain a sense of personal value, and the promise of literal and/or symbolic immortality to those who live up to these standards” and on the other by having self-esteem, “which is attained by believing that one is living up to the standards of value that are part of the cultural worldview.”²¹

As such, where Cave explains why death motivates humans to build civilizations, TMT explains how it motivates them to keep them in place. For instance, the authors of TMT have found²² that when subjects are reminded of the inevitability of death (by contextual reminders or showing them videos about death), they exhibit behaviors that display an adherence to their cultural belief system or that reject different cultural belief systems. In other words, by providing symbolic conceptions of reality that can be shared by members of a community, human culture is in some sense the emanation of the collective fear of death that provides people with a purpose in life. The content of these shared beliefs will be different from culture to culture but in each case they promote certain behaviors by promising literal or symbolic immortality, through religious dogmas (here we find the second and third paths) and social institutions (here we find the fourth path to immortality) - all of which give each individual a purpose to fulfill, and therefore, the opportunity to cultivate their self-esteem.

¹⁹PYSZCZYNSKI, Tom, GREENBERG, Jeff et SOLOMON, Sheldon « Why Do We Need What We Need? A Terror Management Perspective on the Roots of Human Social Motivation », *Psychological Inquiry*, Vol. 8, No. 1 (1997), pp. 1-20; Abstract

²⁰*Id.*, p.5

²¹*Id.*, p.2

²²PYSZCZYNSKI, T., GREENBERG, J., SOLOMON, S., ARNDT, J., & SCHIMEL, J. (2004). « Why do people need self-esteem? A theoretical and empirical review », *Psychological Bulletin*, 130, 435-468

B – The risk of losing the motivation that comes from the paths to immortality

The current research in NBICs is the most advanced and promising effort for achieving the first path to immortality, which is simply to not die. Although this path is the only one that can actually provide some tangible sense of overcoming death, for all human history it has been a vain effort, which is why humans have turned to the other three, believing in religions, having children and being enterprising and creative. The fear associated with the post-human condition here is fairly understandable: without death, we might lose the motivation for all these endeavors. If “history is what man does with death” as Hegel suggests, then this post-human condition would signal the end of history.

However, although the post-human world may give the impression of having achieved the first path, this will only be an impression, for death will still be a potential end and therefore we would still need to stay alive day by day: if a post-human stops eating, or doesn't treat a wound, or doesn't take shelter in the snow, he might die. As long as some behaviors will be necessary to avoid death from occurring, the ever-present potential of death will continue to give purpose to most of our actions, at least in their most essential and elementary aspects: agriculture and food, clothing, building, medicine, technology and so on. We could indeed imagine a post-human world where our biology was changed in such a way that some current threat wouldn't be dangerous anymore: suppose a world where through some genetic manipulation, we were far more resistant to cold and could fall asleep naked in the snow just as easily as on a summer beach. Well, perhaps we wouldn't manufacture winter clothes anymore, but the rest of life would continue pretty much the same. If we are to go further and imagine a world where we have no needs anymore, then I believe we've reached another stage of human experience that is too removed from anything we can usefully talk about.

So in the post-human world I'm considering, we'll still need to maintain our lives, and this will motivate us to act accordingly. But what about the less elementary aspects of our behaviors? Even in these more immediate and necessary branches of human activity, there are some activities that don't respond directly to the threat of death, but more to the other paths to immortality. Let's take the reasons for building houses and imagine it like a cake: the actual endeavor of building a solid functional shelter would respond to the need to protect yourself from the hazards of the environment (path 1) – this would be the base layer of the cake. But what about the extra chocolate layer and frosting on top: would we still need to build churches, castles, palaces and hotels? These edifices require far more effort than the minim required to survive; just like haute-couture in the clothing industry or refined cuisine in the food industry. In

a world without death, would we cease to see the purpose for pursuing all of these “non-essential” endeavors?

According to TMT, we have three motivational systems directed at ensuring our survival: the first contains “direct biological motives” that respond to our biological preservation and the second contains “symbolic-defensive motives” that respond more to our symbolic preservation. I’ll talk about the third later because for now what’s interesting is the relationship between direct and defensive motivations:

“Whereas biological needs may drive us to seek food, sex and social contact, terror-driven cultural proscriptions [i.e. what underlies the symbolic motives] play an important role in determining what we eat, how we have sex and with whom we affiliate. Thus, although internal homeostatic processes and innate behavioral proclivities [i.e. biological motives] play an important role in much socially significant behavior, the symbolic terror managements needs for meaning and value [i.e. symbolic motives] often determine the specific ways in which our biological proclivities are expressed.”²³

This tends to show that our acts are often driven by two kinds of motives: there’s a base need that springs out of our survival instinct and then as soon as survival is assured, that need becomes a social, symbolic desire. As such, in modern societies, where resources are abundant and technology tailored to our needs, people spend very little time responding directly to their base survival needs, even though any abrupt change of social context may cause a rapid return to more base preoccupations. But according to TMT, people seek symbolic-defense mechanisms in order to keep the anxiety-inducing thought of death at bay:

“although we may know intellectually that death awaits us, truly acknowledging it is clearly quite a different thing and in fact we are extremely talented at denying it. Our most common strategy is suppression and repression. We bury the anxiety about our inevitable death deep in our unconscious while we busy ourselves with our lives, in the apparent expectation that we will carry on doing whatever we are doing indefinitely.”²⁴

²³PYSZCZYNSKI ,Tom, GREENBERG, Jeff et SOLOMON, Sheldon « Why Do We Need What We Need? A Terror Management Perspective on the Roots of Human Social Motivation », *Psychological Inquiry*, Vol. 8, No. 1 (1997), pp. 1-20; Abstract

²⁴*Id.* p.5

The three other immortality narratives exist mainly because of the failure of the first one. If the transhumanists are right that our technological advances will allow us to realize this first path to immortality, then the fear is that the three other paths would lose their purpose and as a result we wouldn't be motivated to pursue anything that wasn't directly aimed at biological survival: we wouldn't indulge in spiritual or religious myths, we wouldn't have artistic ambitions and we wouldn't build extraordinary structures. Is this fear justified? Let's look at each path.

1) Resurrection (second path) and spiritual survival (third path)

First of all, with regards to the second path to immortality, there are today few human activities that are motivated by a pursuit of resurrection because our understanding of biology makes it an unlikely possibility. We've pretty much accepted that once someone is dead, they're not coming back. What has changed is what we consider to be dead. Medical practices and technology allow us to reanimate or keep alive people who previously would have been doomed – and we may say that these people were “brought back to life” – but what we actually did was prevent them from dying. Two hundred years ago, a person who stopped breathing was declared dead – now, they can still be saved by CPR or by pushing a pipe down their throat to force oxygen into their lungs. It's worth noting here that whenever people learn that their friends or relatives were pulled from a fire or rushed to the ER, everyone wants the fire fighters and doctors to do everything in their power to save them, which if anything is a solid sign that when confronted with the end, even the most hardnosed bioconservative sees his primal desire to cheat death and have more time to enjoy this life jump out of its mental closet. The only serious avenue today that may seem to be walking down the second path to immortality is cryonics. But again, technically speaking, cryonics isn't about bringing people back from the dead – it's about avoiding death from occurring by preserving bodies in a state in which the viability of the brain can be maintained and hopefully returned to a functioning capacity. And so if the post-human condition is realized and cryogenically frozen people are reanimated, cryonics will have served its purpose and may be a practice of the past. But today, other than cryonics, most behaviors that are motivated by a hope for resuscitation really become behaviors motivated by the second path, such as reincarnation which presupposes the belief in an immaterial soul.

The third path to immortality is spiritual survival and it explains most of our mystical, spiritual and religious beliefs and practices. Here again, science continually sheds light on the nature of consciousness and no solid scientific evidence supports the possibility of an immaterial “soul” or “spirit” that would be inhabiting the body and capable of existing independently of it.

Yet the fact remains that there is no solid evidence against it either and the first thing to point out here is that the post-human condition won't change that. And insofar as death will remain potential, there will still be room for religious and otherwise mystical beliefs about the afterlife. So there's little chance the post-human condition will nullify the purpose of religious belief, or at the very least of an immaterial conscious experience.

But suppose it did: suppose it drastically weakened the appeal for a belief in an immaterial soul, focusing so much of our attention on the certainty of a material body and the consciousness within it that religious belief the world-over became just as benign as deism and as potent as some everyday superstition. If this was the case, would future generations construct edifices such as the cathedral of Notre Dame, or philosophize like Thomas Aquinas, or organize the World Youth Days? Maybe not, but people today don't spend much time building huge pyramid tombs, or prophesizing about what the Moon wants, or going to alchemy class. So maybe in the future we'll have to wonder whether shedding some of our current beliefs and behaviors is worth it. Jerusalem is undoubtedly a fascinating city filled with history, but it is also the theatre of many conflicts where hundreds of people have died in the construction, conquest and defense of holy sites. Some day Jerusalem may become a completely peaceful city where people from all over the world can relax and admire the edifices, reflecting on the stories they hold. And that's nice. But what's best for the future? Do we want more cities to be built and fought over in this way *for these reasons*? In this case, the reason was the third path to immortality, spiritual survival, religious belief. Perhaps a post-human future will be a time when people build and fight over cities for reasons that are attached to what is certain here and now, not to what is uncertain somewhere in the afterlife. Whether or not we view this as a positive evolution is a matter of judgment and surely one's current creeds will inform their intuition.

But I think it's useful for us here to distinguish spirituality from religion. Spiritual experience is something that may come to be pursued far more independently from religious belief. For instance, there's little doubt that we will stop holding funerals; but even the purpose of funerals has evolved over time. Several centuries ago, funerals were held to ensure the peaceful transition of the deceased into the afterlife, and depending on the time and place, many intricate procedures had to be performed in order to achieve it. Today, except in devout religious communities, funerals are mainly places for the living to gather and pay their respects to the deceased. The concern has shifted away from the future well-being of the deceased to the memory of the deceased's past and the current well-being of those still alive. In other words, spirituality has already been slowly moving away from the immaterial afterlife to the material life. Perhaps in the post-human world, spirituality will be a discipline of the mind that people pursue

in less religious settings and for less superstitious reasons, and insofar as it refers to states of the conscious mind (bliss, communion, peace of mind, etc.), post-humans will undoubtedly still have reason to be spiritual beings.

2) Symbolic survival (fourth path)

Let's now look at the fourth path to immortality: symbolic survival. This is the one that, if it came to disappear, would cause the most damageable loss of motivation for humanity, because it is in order to achieve symbolic immortality that people have children, put efforts into non-vital work and pursue artistic projects. Would all these aspects of life lose their purpose in this post-human world?

a. Symbolic survival through procreation

Why do people have children? The basic reason is a biological one: our primary goal as biological beings is to survive, and the best way to ensure the survival of our genes is to procreate. This basic reason is reinforced today by a social one: as social being, survival means ensuring the survival of our memory, our ideas, our experience through our children. This is what we could call memetic survival. When we procreate, we transmit our genes (genetic heritage) to our offspring, and when we parent, we transmit our memes (memetic heritage) to our children (whether they are our offspring or not). One thing to notice here is that memetic transmission matters more to people than genetic transmission; just ask people whether they would rather procreate and immediately give away their offspring to other parents, or become the adoptive parents of someone else's offspring. I think it's safe to assume most people today would chose the latter, even though obviously people would prefer to do both, which just happens to be the easiest option anyways. But this question clearly shows where our current priorities lie: social survival matters more than biological survival. Why is this interesting? Because it shows the power of society, which has overridden nature as our primary sphere of existence.

But in this post-human condition, where our own genes and memes would essentially be preserved with no immediate need to replicate them, would humans feel the need to have children? Indeed, the need for genetic and memetic survival only makes sense insofar as there is a death to be survived.

But perhaps the "survival" part is not what people most want when they have children. Rather, it may be everything that comes with having children: raising them, playing with them,

seeing them grow, educating them, helping them understand the world, make friends and contribute to society, and most importantly live beside them. The reason people value memetic survival so much is because the process of memetic transmission is extremely rewarding in itself. “Memetic coexistence” as we could call it is really what people want when they decide to have children. Again, how to be sure of this? Imagine the two following scenarios:

- Life A: you have one child, you raise him/her, you enjoy all the experiences of being a parent, but your child tells you he/she will never have children, and you yourself can't have any other children (even adopted). When you die, you're symbolic genetic/memetic survival will only last as long as your child lives, but no more.
- Life B: you lead your life without ever having children, but unbeknownst to you, a child is born from your sperm/ovum and is raised by a clone of yours – such that when you die (and your clone dies at the same time as you), you will never have parented any child, but that child will technically be the genetic and memetic survivor of you.

In both case, the child lives beyond his/her parent's death and goes on to do what he/she wants to do, so this is an equally happy life in both cases for the child. But which of these two lives is more appealing to *you*? I suspect for most people, it will be life A, the one where they get to raise their child and live with them.

In other words, the reason most people today want children isn't to survive symbolically through them, but to physically coexist with them here and now, in this life. And so, in the post-human world, despite not needing to survive symbolically, there's a strong chance that people would still want to experience this process of parenting children and having families, for all the associated benefits that come with it. Furthermore, they could do so exactly at a time they deemed appropriate and wouldn't need to worry about spending 18 years raising a child because after that they would have all the time in the world to enjoy living in the same world as them.

However, this presupposes that our desire to parent children would survive our need to ensure a symbolic survival. Perhaps our responses to the question of what matters most in the pursuit of children may be clouded by our current condition – speaking to a social being, the priority is “memetic coexistence” - but if we were to dig down and speak directly the biological being, the real answer may well be: “To spread my genes.” Perhaps all other reasons to enjoy parenting are built on the foundation of our biological urge to replicate our genetic material, and so if that foundation were to disappear, everything else would crumble. This is a very real possibility: people just keep on living without ever wanting children because there is no need to symbolically survive through them.

There's one reason to believe this may not happen: it's quite possible that memetic survival could replace genetic survival, and so it would become like an evolutionary imperative to have children in order to multiply and spread our memes. The memetic world would take over from the genetic world, and we would just continue being the agents of their propagation. And this will entail having children, who will provide both the diversity to test the robustness of our memes and the numbers to defend and spread them.

But suppose this "memetic evolution" doesn't kick in and the desire to be parents got sucked into the void left by the disappearance of the need to have children. Let's consider that scenario, where because of our indefinite lifetimes, we didn't feel the urge to genetically reproduce, which in turn voided our need to mimetically reproduce, which in turn emptied our desire to have children altogether. This would be a shame, right? To us, it seems that way. But should it?

Consider this: today, many women start feeling the urge to have children when they approach their 30s, because they know that statistically their chances of bearing children go down until menopause. But at younger ages, many women don't want children. We've all witnessed this: younger people saying they don't want children, to which adults reply: "You'll see when you're older, you'll want kids too." Generally speaking (obviously there are exceptions), there is an age until which people just don't want kids or at least don't feel the need for them. Why? Most probably because they don't feel the pressure of time weighing on their biology yet and they are more preoccupied with other more valuable projects. Meanwhile, men don't have the same temporal pressure as women to have children, and no one finds it problematic that men on average feel the desire for children later in life. It is actually often seen as unfair that women feel the pressure of procreation earlier than men, because this pushes them to have children younger than they otherwise may have liked and puts them at a disadvantage. But suppose we could magically change the biology of women so that their fertility was the same as men. I doubt anyone would oppose this? Women would get more time to do whatever they want to do and could have kids later in life. But men and women would both still generally want kids before they get too old, and would probably start feeling the desire for children at around the same age - let's say 45, because the only consideration then would be to have children before you're too old to raise them comfortably for 18 years. This makes sense given our current lifespans, because raising kids when you're past 70 isn't ideal. But then suppose, again, we could magically stretch our life-cycles so that we started getting old at 120, slowly declining to a natural death aged 200. Would people still feel the urge to have children aged 45? I doubt it. Let's say the average age at which people started having kids then was 90. Would we feel any differently about the woman who

prefers to have children aged 90 than we would about the woman who prefers to have children aged 45?

You see what we're getting at: if we push old age back indefinitely, people may go on indefinitely without ever feeling the urge for children, and why should we think that is inherently a bad thing? Do we think it is wrong of people today who don't want children to not have any? No, if anything, we feel sorry for them. Why? Because we feel they're *missing out* on the experience of parenting children. Which is precisely my point: if people in the post-human world want to have children, it will predominantly be for the experience of parenting them – which in a sense is the best reason for having them. Having children will surely become one of those experiences that people want to go through – not because it ensure survival (although that may still play a part, children may be seen as symbolic survival backups in the case of an accidental death) but because there is really no other experience like it. Why wouldn't people want to go through it? And if they don't, it shouldn't matter.

Actually, there are only two situations in which it would matter. The first is if it became apparent that society as a whole was suffering for lack of new people. Insofar as new generations learn from past generation and strive to achieve more than those they learnt from, they provide welcome boosts of energy, of “new blood” and perspective into society. Without them, perhaps society would slow down, would lack progress. People today are often driven to make the world a better place because they want their children and grandchildren to have a better world to live in – but if post-humans (who don't want children) live in a world that is satisfying to them, why would they strive to make the world a better place? New people keep society on its toes, demanding ever better standards and keeping the engine of progress going. What if the post-human world, where people didn't have children, became stagnant in this way? Well, this would provide an extra incentive to have children. Perhaps having children in the post-human world will be considered as a social good and those who have children will be gratified by the sense of contributing to the engine of progress.

The second situation is far less likely: suppose everyone kept on living happily without ever wanting children, then eventually, enough people would die out of accidental causes that the species as a whole found itself severely lacking numbers. In that case, having children would become an existential imperative, and I doubt people's biological alarm bell wouldn't kick in and get them all procreating pretty quickly.

b. Symbolic survival through work

One of the most obvious endeavors that could lose its reason-to-be in a post-human world is work, insofar as one of the basic justifications for labor is to survive. If we can enjoy indefinitely long lives, why work?

First of all, in the post-human condition, all the vital needs of the population will still need to be ensured: that includes agriculture, construction, clothing, etc. but also performing and improving all the scientific, medical and technological means by which the post-human condition is achieved. So there will be a social purpose to performing the tasks required for survival. Second, unless some form of universal basic income is established throughout the world, people will still need to work to make enough money to sustain themselves. So there will also be an individual purpose to working. And third, if post-human societies come into existence, this means people have sought out longer lives to enjoy: enjoying them means living in a society that is enjoyable, and this in turn means that most industries won't suddenly go out of business for lack of workers. People will need money to enjoy their lives and everyone will need everyone else to work different jobs so that the full range of goods and services that people will deem required for an enjoyable society are available to all.

These three reasons may be enough to keep things going, but what about activities that require extra effort, or big risk-taking, or extensive research – the kinds of efforts that perhaps would be only motivated by a quest for symbolic survival beyond death? Again, I think it's safe to assume that most such efforts today aren't primarily, or at least not originally driven by a quest for immortality, but rather by the pursuit of more immediate gains that can be obtained by that effort. Why did Bill Gates spend so much time locked away in his garage designing Microsoft? It surely wasn't, originally, for the glory of posterity, but rather because of his interest in computers, the desire to invent something useful and the realization that his software might make him the richest man in the world. This idea that entrepreneurs are mainly motivated by a noble quest to etch their name in history is not only reductive but overly romantic. Entrepreneurs are mainly motivated by gains that they can enjoy in this life: excitement, status, money and power. And these will push people to put in the extra shift, because there's no reason to believe post-humans will lose their spirit of competition. The post-human world will still have relative inequalities. We will still have some poorer neighbors whose lives we wouldn't want to have and whose situation will motivate us to not lose our current benefits; and we will still have some wealthier neighbors whose lives we envy and who will motivate us to work harder if we want to gain a similar situation. Look at millionaires today: these are people who already don't need to work to survive, who have enough money to comfortably live several lives over, and yet they keep working,

sometimes in jobs that they don't particularly feel passionately about. Why? Immortality may be a reason, but it's mainly because someone has a bigger yacht.

People won't stop doing research either. Whatever the field, even if glory may be motivating, it would be insulting to suggest that the main reason scientists, academics and engineers around the world spend hours doing research is to win a Nobel prize. Obviously, the thought that our work will live on beyond us matters, but this is not so much to ensure immortality as it is to contribute to a collective enterprise of scientific enquiry that will continue once we are gone and hopefully improve the lives of those to come. If I'm currently writing this paper, for instance, it is with the modest hope of contributing something to a much larger project of philosophical reflection that has been ruminating for centuries before I was born and will continue long after I am gone. But if an oracle told me that some incurable mental disease was going to strike humanity in 2020 and bring an end to all philosophical inquiry, I may not even see the point in finishing this paragraph. However, I don't need an oracle to know that I will come to an end before the philosophical enterprise does, and while this persuades me that my work is not for nothing, it is mostly a sad reality, not a motivation. I will pass on the baton without ever seeing the finishing line and the fact that I accept this condition doesn't mean that I wouldn't have liked to continue taking part in the race myself. Should we believe that a scientist, who his whole life contributed several blocks to the house of human knowledge, wouldn't have wanted to continue building it if he had more time to do so?

Research is guided by other motives than to survive death: interest, curiosity, a thirst for knowledge, the desire to contribute to human culture, or even just professional gains and social status. The post-human condition won't weaken these motives, if anything it might reinforce them: indeed, if we assume that the post-human condition will have been justified by a desire for more life, people's general concern will be with maximizing the quality of that life, so most of our endeavors will be motivated by the desire to improve our knowledge of ourselves and of our environment in order to make our lives better. We may not derive an *ought* from an *is*, but we still need to know what *is* in order to better decide how we *ought* to live – and this will give purpose to all the efforts required to make what is as good as it can be.

c. Symbolic survival through art

Finally, a third category of activity could lose some purpose in this post-human condition is creative and artistic endeavors. Here more than anywhere else, one could suspect that an important motive for pursuing creative projects is to ensure a symbolic survival beyond our own

death. Indeed, “the attempt to impress posterity is a powerful productive impulse that has given us some of the pinnacles of human achievement.”²⁵ In France, the *Académie Française* is the pre-eminent council of 40 respected writers, poets and other cultural intellectuals that serve as the national authority on matters pertaining to the French language: its members are called “*les immortels*” (the immortals) and the institution’s motto is “*A l’immortalité*” (To immortality). There’s no doubt that artists in all disciplines hope to ensure some form of symbolic survival through their work. But would a potentially indefinite life signal the end of all artistic projects?

Once again, we may begin by asking what drives artists today? Is it *only* for posterity? Or rather, we should ask: is posterity a *necessary* motivation that founds all other motivations for pursuing artistic interests? It surely depends on the artist – some may be more driven by the quest for immortality than others. But then, in that case, in the post-human condition we may lose only the artists who don’t have other sufficiently strong motives to perform their art – and that may be a price that society deems acceptable.

The post-human world would also lose certain very fertile sources of inspiration: indeed, if there were no more “old people,” no more “handicapped people” and no more regular struggles with death, then there’s little chance that the post-human world would spawn Shakespeare’s *King Lear*, or Jean-Dominique Bauby’s *The Diving Bell and the Butterfly* or Michael Haneke’s *L’amour*. But that is the nature of art: representing reality. Surely we aren’t going to preserve certain tragic conditions simply because they make good entertainment.

More importantly, I think we should be more charitable when assessing why people pursue their creative streaks. Sure, many have claimed that immortality is the end game to everything they do, but in many cases they say this when asked if it is, and surely agreeing that some romantic quest for posterity is better than saying money or fame. But in reality, it’s not posterity or even money or fame that drives artists to put pen to paper or paint to canvas, it’s the pleasure of the activity itself, the expression of a message, the sharing of emotions, the search for meaning, the quest for beauty – many reasons that are motivations of the present, not the afterlife and that won’t go away in the post-human condition. Quite the contrary, they’ll be even stronger, because we’ll be there to enjoy them.

C – A loss of motivation to be tempered

It therefore appears highly unlikely that in this post-human condition our activities would lose their purpose to any unacceptable degree. Our purpose will shift away from ensuring a

²⁵*Op. Cit.*, CAVE, 2012, p.138

spiritual or symbolic survival onto ensuring the continuation of our current life. Some motivational purposes may lose their strength and even disappear, but others will take their place: enjoy our children, enhance our quality of life, cultivate our interests.

However, it is far more reasonable to fear a standstill of society as a result of a negative side effect of such a motivational shift, a kind of backlash of the first path to immortality: assuming that our motivation becomes mainly directed at continuing our current life, we will be highly motivated to preserve it. This could cause excessive caution and a will to ensure the status quo: will people still want to take risks?

The first and obvious reason to believe they will is this: to get things they need or want. It may be risky to harvest crops, but we still need food and people will have to go and do it. We will come back to the question of risk taking in part II when we analyze the effect of deadlines on the motivation to perform tasks that require taking risks.

But some may still claim that what pushes people to achieve great things is the challenge of overcoming their biggest obstacles – and what greater obstacles are there than biological limitations such as physical/mental weakness and the risk of death? Without any biological ailments (no old age, no handicaps, no illnesses), would the post-human condition become a sterile world where “overcoming ones limitations” is never more than a fairly inconsequential affair? Will feats and exploits still exist? Once again, while we can understand the strange nostalgia hiding behind this question (it’s true, a world without the Paralympic Games would lose a source of wonderful achievements), we shouldn’t ignore its morbid insinuation: that we should preserve limitations that we could otherwise free ourselves from and subject ourselves to an adversity that could hypothetically be nullified in order to maintain the motivational power of the challenge and the beauty of the achievement.

What’s particularly pernicious with this thought is that it prevents us from seeing new opportunities that could be open to us. Let’s image a man born without the use of his legs: he is limited in his movements. He learns of a new treatment requiring months of hard training that would allow him to stand on his legs and walk several steps without help or support. The man would first feel empowered by the challenge and would be enticed to overcome his limitations, so he begins the treatment. After months of arduous training and several failed attempts, he finally manages to walk a few meters. This is a true feat, a victory of will on natural adversity, and it’s a beautiful, inspiring sight. But for everyone else, people who were born with healthy functioning legs, walking those same few meters would not be a feat of any kind and in truth, they may (hopefully) never feel the same kind of motivation nor the same intense satisfaction at pursuing and achieving that particular goal. But does this mean we should envy his handicap? No. *We can*

walk those few meters if we want to, and if we do, we don't do it to overcome our limitations, but for other reasons in view of which the act of walking is just one trivial mean in the many means necessary to achieve it. If we want to overcome our limitations and achieve something extraordinary, we would have to run a marathon for instance. For this hypothetical man, running a marathon is completely unthinkable, it's not even on the charts of what is possible, and it may not even be wise for his mental health to consider it, given how impossible it is. In other words, seeing as we enjoy normal functional legs, we may never feel as motivated to walk those 10 meters as the handicapped person, but we can walk anywhere we want, to pursue other motives that he can't even contemplate. This handicapped person's situation is like the human mortal's situation: death imposes a limit that may indeed push us to defeat it and achieve our greatest feats, that is, walking a few meters; if one day we could enjoy two fully functioning legs, unimaginable paths may then be open to us, not to mention the hikes and marathons we could embark on and enjoy.

Let's not forget, either, that the post human world won't be a world without limits. There will always be limits that present challenges to overcome; for instance, our brain will know limitations (in terms of memory or processing power), our degree of control over our environment can always be improved (harnessing the power of our resources, of our planet, of the sun, and beyond). There will always be limits to overcome, frontiers to cross, projects to pursue. What will our motive be? The answer is just as biologically logical as survival: to make life better, to improve the well-being and experience of conscious creatures such as ourselves. We already noted that more life is only desirable if it means good life; and what's more desirable than good life? Better life. If NBIC technologies allow us to live on indefinitely in a healthy body, they will free us from a great deal of burdens that negatively impact our current quality of life. And then it will be up to us to continually seek to protect and improve that quality of life. In other words, the current level of quality of life will be at all times the limit that we will seek to overcome, and the true feat will no longer be to live longer lives, but to live better lives.

II – A loss of motivation because of a loss of pressure

The second and most intuitive reason to fear a major loss of motivation in this post-human world would be the loss of temporal pressure currently caused by the natural degradation of the human body. Indeed, senescence causes many different deadlines that are more or less predictable in the future and that can elicit pressure as they get closer. And so, without the biological deadlines of old age and death, the fear is that we wouldn't have any pressure to act and we would perpetually push things back to tomorrow. To evaluate this fear, we first have to analyze how old age and death cause a pressure that motivates us, and then we have to see if this pressure is itself necessary to human motivation.

A – The natural degradation of the human body : biological deadlines that cause a temporal pressure to act

1) The features of the biological deadlines

What are deadlines? They are limits in the available time to do something. It's important to understand that they contain both a temporal and a spatial component to them: on the one hand, a deadline is a specific moment in time (a date and a time, whether it is known in advance or not) and on the other, it marks a change in the state of the world, more precisely the end of "state of the world A" and the beginning of "state of the world B." The deadline is the moment of a change. These two elements – the moment and the change – are not only inseparable from the idea of deadline but also constitutive of each other: indeed, two states of the world A and B cannot exist simultaneously and so the change from state A to B implies the existence of a temporal moment T between them; and in order for there to be a temporal moment of any kind, there needs to be change from A to B, because without B, A simply exists continuously as it is, and there is no T at all. In other words, for there to be a moment T, A must change; and if A changes, this implies there was a moment T when A became B.

In other words, a deadline implies that A is impermanent. To say that a state of the world is permanent (i.e. it knows no change) is the same as saying that it has no deadline; inversely, if a state of the world is impermanent, then this means there is a deadline. Deadlines can have several features:

- Subject: who they concern and/or who they are administered upon.
- Origin: they can be natural or artificial, and they can be external or self-imposed.

- Predictability: the moment of the change can be knowable or not.
- Variability: the moment of the change can be set in time or can be modulated.
- Avoidability: the moment of the change can be avoided or not.
- Reversibility: once “state of the world B” has happened, can we return to “state of the world A”?
- Value of the change: is the change positive or negative in terms of the consequences of going from A to B?

Depending on all of these features, deadlines can cause more or less pressure; the more a deadline is natural, external, fixed, unavoidable, irreversible and causes a change where the balance of values is negative, the stronger the pressure. Given all these variables, when faced with a deadline that is anticipated as positive or negative, we can find ourselves in one of four different dynamics (see annex) that determine how we generally feel about the deadline: either the state A is preferable, in which case the deadline will be a source of angst; either the state B is preferable, in which case the deadline will elicit impatience. We could ask why deadlines cause these feelings in the first place, but we’ll simply assume here that the accepted basis for this conversation is that we want to have/keep what we like and want to avoid/get rid of what we don’t like.

So what are the deadlines that will disappear in a post-human world? If we continuously maintain the body in an optimal state, we lose all the biological deadlines that would otherwise come after this optimal state: that means all the deadlines that are the result of ageing (menopause, physical and mental weakness) and death. All of these deadlines have similar features: first, they all mark the change from a situation A that has possibilities to a situation B that has less possibilities. Menopause, for instance, is the end of the possibility to bear children; old age progressively narrows the possibilities of physical and mental activity; and finally death is the end of all possibilities.

All of these deadlines are natural, external, and they concern everyone. They are relatively predictable: menopause arrives around 40, old age around 60/70, and death around 80/90. Even if their exact moment is not knowable (it can become knowable, in the case of an execution, for instance), we can more or less estimate their arrival through statistics. But all these deadlines are also variable: they are not fixed in time and we can usually modulate our temporal distance to them (for instance, if I stop smoking tomorrow, I may have added several years to the natural deadline). However, there is one big difference between these deadlines: under normal circumstances, they can’t be moved forward, except for death, that can happen at any time.

More importantly, though, these deadlines combine two of the most pressure-inducing features: first, they are unavoidable. For instance, even if by quitting smoking I push the moment of my death back by a few years, I can't stop the fact that I'm constantly getting closer to the deadline (the second I stop smoking, I will still get one second closer to dying). No human being, since the dawn of humankind, has been able to avoid old age without dying young enough to not experience it and every human being, sooner or later, dies. And second, they are irreversible. We may be able to cure an age-related illness and we may even be healthier at 60 than we were at 50, but senescence is process that keeps going and irreversibly robs people of possibilities until death dispossesses us altogether forever.

To recap, then, biological deadlines of senescence and death represent an irreversible loss of possibilities, imposed on humans, the moment of which is relatively predictable and somewhat variable but that cannot be avoided. What matters furthermore is that when determining the balance of values either side of the deadline, the state of the world A, where we have possibilities, is preferable to the state of the world B, where we don't have possibilities. Why should A be preferable to B? I will assume here that the statement "having possibilities is preferable to not having possibilities" is as uncontroversial as "being alive is better than being dead" and as morally agreeable as "peace is better than war" and move on without examining under what circumstances one could argue otherwise. We have good reason to want to hold on to possibilities and ultimately to life. Consequently, the approach of this unavoidable and irreversible loss is the source of an existential terror: the loss of losing all that is possible. This is a pressure that rests upon a fear of being dispossessed; indeed if we weren't afraid of losing what we have, the pressure would be empty. Again, we could wonder whether we shouldn't challenge this natural bias towards possession – indeed perhaps we should be more accepting of dispossession, in which case death, at whatever age, would be no problem at all. But again, not only would such a general acceptance be far too removed from the natural biases of living organisms to be interesting to this current inquiry, but more importantly, I don't think this is a healthy approach to promote in the context of a conversation on radical life extension. Such dispositions are only valuable in the face of true adversity – that is limitations that cannot be removed. *Amor fati*, acceptance and other Buddhist wisdom on the human condition are all extremely valuable so long as death is unquestionable – but if it becomes questionable, then refusing to fight it on the grounds that we should accept it is just about as useful as not turning the engine back on once the traffic jam clears out.

I suspect that when people oppose radical life extension on the grounds that we shouldn't give into our natural urge to not be dispossessed of possibilities, they are actually the ones who

are succumbing to an unchallenged suspicion of greed that has been (rightfully) drummed into them by centuries of wisdom in a world of scarce resources and abundant limitations. We should enjoy the time we are allotted, and while moderate efforts to keep us alive within tolerable margins is okay, anything more radical is greedy, and therefore contemptible. This makes no sense. Why shouldn't we value the possession of possibilities? Again, I will assume that all else being equal, we should. If some people want to argue for a philosophy of letting go of our possessive tendencies, of our inclination to be alive, then that's fine – but we're not interested in building the same future for humanity, because we're not assuming that humanity *is* the same thing to begin with. By the way, the pleasant thing to remember with the post-human condition, if anyone felt worried, is that it doesn't take away any possibilities, it only adds them – including the possibility to die whenever you want. People will be able to choose to evolve however they like, and if they want to live like we do now and die at 80 of old age, then no one will argue with them. Except perhaps their loved ones.

With each deadline, we can see that the greater the dispossession of possibilities, the stronger the pressure will be, and interestingly, each deadline costs more than the previous one. Indeed after reaching an optimum age of maximum possibilities, senescence slowly kicks in and deprives us of more and more consequential possibilities without adding new ones, until ultimately death robs us of all possibilities. So if we look at the table (addendum), we can see that the type of deadline we may lose in the post-human condition marks the transition from a positive situation A to a negative situation B, and that therefore it causes a pressure that expresses itself in three correlated feelings that we need to analyze independently:

- a sense of opportunity towards situation A;
- a sense of threat in regards to situation B;
- and a sense of urgency.

2) The three correlates of the pressure

First of all, seeing as the deadline signals the end of the possibilities that are available in the situation A, the situation A is perceived as being positive in comparison to situation B. This announced dispossession makes us feel lucky for the opportunities of life and thus motivates us to seize them. The argument goes that if an opportunity was always there for the taking, we would have less motivation to pursue it. It is with this shortage in mind that we would say “we only have one life” or “Carpe Diem.”

Conversely, seeing as situation B is perceived as worse than situation A, then as the deadline approaches, we see it as a threat. It is like a promised punishment: we don't want it to happen, but seeing as we can't avoid it, it's a menace.

Finally, seeing as the deadline is unavoidable and relatively predictable, it allows people to construct a temporal horizon that limits their action and is therefore a temporal pressure that forces them to act: this gives rise to a sense of urgency. We are aware that the deadline is always getting closer. Time doesn't stop and that's why we feel pressure: every second, the window of action gets smaller. And this sense of urgency can reinforce both the sense of opportunity (it pushes us to do things before it's too late – "life is short!") and the sense of threat (it pushes us to do things before the threat is executed). Generally speaking, we could worry that if we weren't afraid of lacking time to do things, we would have no reason to do them today instead of tomorrow, would simply be tempted to constantly push things back and ultimately would become lazy procrastinators.

These feelings mutually reinforce their effects: the feeling of opportunity gets stronger as the window of available time gets shorter and that the loss of possibilities is greater; the sense of urgency is strengthened by the fact that the deadlines marks the loss of possibilities; and the threat gets more menacing as the deadline gets closer.

CAUSE	PRESSURE	EFFECT
DEADLINE Moment + Change	Sense of opportunity →	MOTIVATION
	Sense of threat →	
	Sense of urgency →	

3) The fear of loosing the pressure of the deadline

If we look at the table, we can see that this kind of deadline is source of anxiety and that therefore we have a tendency to try and push it back – pressure only comes from our inability to do so. Therefore, seeing as the post-human condition promises to push the deadline back indefinitely in order to stay at an age where "everything is possible," then fear is that the threat of losing everything would be gone, we would lose the sense of opportunity and urgency for the possibilities of life and thus not do anything at all.

To know whether the post-human condition would void motivation for lack of pressure in this way, we need to analyze each element in play: are these deadlines as they exist in the

current mortal condition necessary and/or desirable to cause a pressure that is itself necessary and/or desirable for human motivation? If we flip the question around: does human motivation *need* a pressure that *only* biological deadlines of senescence and ultimately death, as they exist in the current condition, can elicit?

B – Are the biological deadlines necessary to cause this pressure ?

To begin with, we may wonder whether as a general matter, deadlines, and therefore impermanence is necessary for this pressure to be felt. Brian Cooney, for instance, claims that in order for people to be motivated to do something, they must feel that sometime in the future that thing will no longer be possible. Without this, our motivation would be insufficient. In other words, even if I want to do something right now, that intrinsic motivation would be insufficient to make me do it, and the future disappearance of that thing would add a necessary pressure for me to act. Let's take a look.

On the one hand, is it possible to have a sense of opportunity for a possibility without this possibility being impermanent? If we agree that the feeling of opportunity comes from the fact that this opportunity (let's say here: watching a movie at the theatre) is currently available and could one day become unavailable, then the feeling of opportunity will feed off the positive aspect of the situation in which X is realized (let's call it situation 1, where we see the film) and on the negative aspect of the situation in which X is not realized (let's call it situation 2, where we don't see the film). If X is impermanent (say the movie will only be in theatres for 2 weeks, with no further release), then we will feel pressured to realize situation 1 before situation 2 becomes reality and we don't have a choice anymore. But the inherent impermanence of X isn't the only thing that can make us weigh the good of situation 1 against the bad of situation 2, there's also the agent's free will. Suppose that X is now permanent (the movie will always be in theatres), my decision to pursue X or not will determine whether situation 1 happens or situation 2 happens. And so if we deem situation 1 (seeing the movie) preferable to situation 2 (not seeing the movie), then the sense of opportunity can be felt: if I don't act, X will not happen, so it's best for me to act. This may seem so obvious it's absurd, because if X is something I want to do, then there's greater incentive for me to realize it that to not realize it, deadline or no deadline.

On the other hand, is it possible to feel a sense of urgency without a deadline? The sense of urgency is defined as an unfavorable relationship between the amount of available time and the

amount of time needed to perform a task.²⁶ In other words, a person is under time pressure “when an anomaly appears between what a person wants or has to do, and what he/she can actually accomplish before the deadline.”²⁷ According to an even more complete definition, time pressure is a “cognitive-emotional feeling of a real, supposed or potential time deficit, that can occur punctually or chronically, either as the result of an intrinsic or extrinsic motivation to respect a dated deadline or not, or in a diffuse way in relation to a goal or way of functioning.”²⁸ As such, a deadline would be needed to elicit the sense of urgency, but it doesn’t need to be fixed nor predictable. The study of human relationship to time throughout history and among cultures reveals an interesting heterogeneity, with a distinction made by Scolloz²⁹ between “event-time culture” of less industrialized societies and “clock-time culture” of technological cultures:³⁰ the more a society is developed, the more people report feeling temporal pressure. But this feeling may not so much be due to more deadlines, but to the multiplication of possibilities: as such “people would perceive a time deficit because they find it impossible to pursue all those that are of interest to them.”³¹ Therefore, in this post-human condition, even though the temporal horizon would potentially be endlessly open, the amount of activities that we could do would also be infinite, as it would effectively become possible to *see* and *do* everything. This abundance of possibilities, coupled with the ever present possibility of dying, could elicit a sense of urgency.

However, one could legitimately wonder what a “sense of urgency” would mean in a world where the temporal horizon is so open, because for people to feel temporal pressure, they need a conception of time, and for that, maybe they need a time limit. If death was indeed quite rare in the post-human condition and the norm was indefinite healthy lifetimes, we may see a complete dilution of our conception of time. Indeed, we saw earlier how time and change were intrinsically linked. Therefore if our bodies stop changing and there is no end in sight, would we somehow lose track of time and be unable to distinguish “before” from “after”? We may end up living in a perpetual present. Ever since Aristotle, philosophers have debated whether time is subjective or objective. For Kant and Heidegger, without consciousness and the awareness of our own

²⁶ RASTEGARY H. & LANDY F. J., « The Interactions among Time Urgency, Uncertainty, and time Pressure », dans O. S. VENSON & A.J. MAULE (eds.), *Time Pressure and Stress in Human Judgment and Decision-Making* (p. 217-240), New York, Plenum Press, 1993

²⁷ SVENSON O. & BENSON III L., « Framing and Time Pressure in Decision Making », dans O. S. VENSON & A.J. MAULE (eds.), *Time Pressure and Stress in Human Judgment and Decision-Making* (p. 133-144), New York, Plenum Press, 1993

²⁸ COEUGNET S. et al., « La pression temporelle : un phénomène complexe qu'il est urgent d'étudier », *Le travail humain*, 2011/2 Vol. 74, p. 157-181, p.164

²⁹ SZOLLOS A., « Toward a Psychology of Chronic Time Pressure: Conceptual and Methodological Review », *Time & Society*, 2009, 18, 332-350

³⁰ LEVINE R., *A Geography of Time: The Temporal Misadventures of a Social Psychologist, or How Every Culture Keeps Time Just a Little Bit Differently*, New York, Basic Books, 1997 ; NORGATE S., *Beyond 9 to 5. Your Life in Time*, New York, Columbia University Press, 2006

³¹ COEUGNET S. et al., « La pression temporelle : un phénomène complexe qu'il est urgent d'étudier », *Le travail humain*, 2011/2 Vol. 74, p. 157-181., p.158

mortality, we would have no concept of time. An end would therefore be necessary so that each moment could be distinguished from the last, by being defined in relations to this end. Death would be the limit from which time would be constructed.

Be that as it may, it isn't unreasonable to think that other factors could give rise to the concept of time. Some authors, for instance, consider that time doesn't require a limit, but rather the presence of observable change. So long as things change (the environment, for instance, on the passage of day and night), time is natural concept that we cannot ignore. As Plotinus pointed out, "where there is change, there is time."³² Furthermore, recent studies³³ have shown that animals and humans would have an inane temporal mechanism, like an internal clock that would give us an instinctive concept of time, without the need for any awareness of an end. It seems reasonable to assume that the post-human world would provide enough observable change in the world for post-humans to have a concept of time. The Earth will still revolve around the sun and seasons will still pass. And we don't live in a paused movie: we move about, our cars break down, we meet people, drift away from them. Everything is source of change, and so potentially source of ends and beginnings and ultimately of time. And as we said earlier, every change is technically a deadline, for it is the end of "state of the world A" and the beginning of "state of the world B." So in other words, everything is a potential deadline from which to reverse-engineer a conception of time.

More importantly, the post-human world will still be full of impermanence and deadlines other than those caused by senescence. All of the things that make up our social reality can disappear without death ever being involved: people can move away, a house can be destroyed, a work of art sold. These losses can be more or less predictable, external and arbitrary. Job offers will be filled, projects will be given completion dates, people will go on dates. And let's not forget that in this post-human condition, even if we can potentially live indefinitely, death remains a potential end. If a post-human stops eating a drinking, he will have more or less a 40-day deadline before dying. So death will remain like a "stealth deadline" that will become more clearly defined as we don't act so as to avoid it. The fact that it is not as present as before doesn't make it impossible, and this ever present possibility of dying should instill in all experiences enough vulnerability to infuse them with the necessary preciousness to cherish their opportunity. But more importantly, many of the possibilities that we may want to realize are themselves limited in time and thus have "built-in deadlines." Some possibilities are more permanent than others and will have little chance of disappearing (for instance, unless Australia suddenly sinks into the sea or

³² Cité dans DROIT-VOLET S., « L'estimation du temps : perspective développementale », *L'année psychologique*. 2000 vol. 100, n°3. pp. 443-464, p.444

³³ ALLAN L. G., GIBBON J., « Human bisection at the geometric mean », *Learning and Motivation*, 1991, 22, 39-58. ; WEARDEN J., LEJEUNE H., « Across the great divide: Animal psychology and time in humans », *Time and Society*, 1993, 2, 87-106.

is blasted by an asteroid, the possibility of visiting Australia remains permanent) while others are more impermanent and may have a very short lifespan (for instance, confessing your feelings to someone before they leave). As such, the sense of opportunity and urgency that can be needed to motivate these desires can be caused by two sources:

- Our own deadlines (old age/death), i.e. the impermanence of our capacity to be able to seize the opportunities (whether they are permanent or not).
- And the deadlines of the possibilities, i.e. is the intrinsic impermanence of each opportunity (whether we are indefinitely able to seize them or not).

A once in a lifetime opportunity, then, could either be an opportunity that is so rare and impermanent that it will probably only show up once, or an opportunity that we, given our current life expectancy and usual life experiences, will only be able to do once. As such, the post-human world will still be full of impermanence, as many opportunities will have inherent deadlines pressuring us to seize them before it's too late.

However, we haven't addressed the whole question, because we have to see if there can be other sources of the *same* pressure caused by old age and death; and here, there simply isn't, because they have several key features that are simply unique to them for two big reasons: the cost is absolute and irreversible, and they concern everyone.

First of all, in terms of causing a loss, nothing can make you lose *everything*. Some possibilities can disappear forever (for instance, if the Maldives were destroyed in a tsunami, the possibility of visiting the Maldives as we know them will be gone forever), but the cost, however bad it may be, of losing each individual possibility pales in comparison to the possibility of losing all possibilities, which is what death causes. Other situations can drastically limit possibilities: slavery, imprisonment, severe illness and disability. But all of these situations not only allow for momentary moments of pleasure and hope that would not be possible in death, but crucially they all, to varying degree, can potentially get better (through liberation or cure in these cases). They are partial losses that are hypothetically reversible, whereas death is absolute and irreversible.

Furthermore, biological deadlines are unique in their features. Indeed, the post-human world will still have two general types of deadlines: environmental (such as seasons) and artificial (man-made, like a due date). But these deadlines are for the most part variable and avoidable (all of the artificial ones, at least) but mostly they can all be overrun. The consequences of doing so may be more or less damageable, predictable and reversible, but you can go beyond these deadlines; Death is the one deadline that you can't overrun, there's no going back and no possible future. As a result, death has no equivalent in its severity and intransigence. As such, the feeling of opportunity, borne from the threat of losing everything, is a feeling that relates again to

everything. And this is something that is again unique. All other deadlines are comparably focused on one situation or one set of opportunities. Seeing as death isn't narrowed and focuses, threatening all possibilities, perhaps its effect is distilled to various degrees of intensity in all our other more particular feelings of opportunity. Suppose I'm in a café sitting opposite my favorite singer; my motivation to engage with her will surely be driven first and foremost by the impermanence of this situation (given that her or I will surely leave within a couple hours); but perhaps it will also be driven, more subtly, by the high improbability of ever meeting this person again given how rare this opportunity will surely be among all the possibilities available to me throughout my limited lifetime. So maybe the deadline of death contributes to the sense of urgency and opportunity in every one of our actions, in a way that only it can do.

Moreover, the sense of urgency caused by the particular deadline of death may be the source of a unique kind of temporal pressure that is different from all the other ones. Social sciences generally define two types of temporal pressure: situational temporal pressure, that can be felt in specific circumstances in relation to a well-defined deadline (such as buying a product before the sale ends) and chronic temporal pressure, that is "an continual struggle to achieve more and more things in less and less time"³⁴ which can be felt even without the presence of a defined deadline. How shall we define the temporal pressure caused by death? On the one hand, the fact that death is generally-speaking a certain and relatively predictable deadline, coupled to the fact that we only episodically think about death, would suggest that death causes a situational kind of pressure; but on the other hand, death is a deadline that affects our psyche to varying degrees throughout our whole life, thus suggesting that death causes a chronic kind of pressure. Combining the features of both general types of deadlines, death causes a third, unique type of temporal pressure, that Andrea Gourmellen calls an "ultimate temporal pressure."³⁵ As such, it would appear that death causes a kind of pressure for which there is no substitute. Given all of this, we must recognize that death is a unique deadline that cannot be reproduced and therefore some of its effects will necessarily be lost in a post-human world.

But then the question is: are these effects necessary to human motivation?

C – Is the pressure caused by biological deadlines necessary and/or beneficial to human motivation?

³⁴RIZKALLA, A. N., « Sense of Time Urgency and Consumer Well-Being: Testing Alternative Causal Models », *Advances in consumer research*, 1989, 16, pp. 180-188

³⁵GOURMELEN, Andréa, « La pression temporelle ultime : conceptualisation et influence sur les motivations au bénévolat des retraités », Thèse présentée à l'Université de Bretagne Occidentale le 18 novembre 2013, p.102

It is absolutely intuitive and reasonable to fear that without these deadlines we wouldn't do anything anymore. Is it not with death in mind that people make a "bucket list"? Many eminent voices and entrepreneurs have stressed the stimulating effect of mortality: Steve Jobs often spoke about the motivating effect of limited time: "Remembering that I'll be dead soon is the most important tool I've ever encountered to help me make the big choices in life [...] to avoid the trap of thinking you have something to lose."³⁶ Same thing with Neil deGrasse Tyson, who despite his infectious thirst for knowledge and adventure, is skeptical about having more time to learn and explore: "It is the knowledge that I am going to die that creates the focus that I bring to being alive. The urgency of accomplishment. [...] If we live forever, why even get out of bed in the morning?"³⁷ And according to bioethicist Nigel Cameron, President of the Center for Policy on Emerging Technologies, death pushes us to take part in life and without it, people would stop doing anything.³⁸

This observation is constantly reminded to us in everyday life, where deadlines undoubtedly influence people's motivation to do things and precipitate the realization of an action: students work hard to hand in papers before deadlines, football clubs rush to get deals done before the transfer window closes (in England, it's even called Deadline Day) and people bring themselves to fill in their tax forms before getting fined for delays. Even peace negotiations have been helped by establishing a deadline³⁹ by forcing parties to come to compromises that they may not have reached with more time.

There is no doubt that the awareness of death enhances our appreciation of life and of the time left to live.⁴⁰ Several studies show for instance that older people, those who have less time on their hands, are more careful with how they spend their time⁴¹ and more often report having less time to lose than younger people⁴² because of a more salient consciousness of the limited amount of time they have left to live. Another study showed that the older you get, the more time pressure you feel and the stronger you want to accomplish everything in the shortest

³⁶ From Steve Jobs' commencement address at Stanford on June 12, 2005: <http://news.stanford.edu/news/2005/june15/jobs-061505.html>

³⁷ Interview with Neil deGrasse Tyson for Business Insider: <http://www.businessinsider.com/neil-degrasse-tysons-answer-to-what-if-we-could-live-forever-will-change-how-you-think-about-time-2017-6?IR=T>

³⁸ Propos rapportés dans un entretien sur le site d'information io9 : <http://io9.com/5933409/would-it-be-boring-if-we-could-live-forever>

³⁹ PINFARI, Marco, « Time to Agree: Is Time Pressure Good for Peace Negotiations? », *Journal of Conflict Resolution*, 2011

⁴⁰ M. DE HENNEZEL & B. VERGELY, « Une vie pour se mettre au monde », *Paris: Carnets nord*, 2010, p. 63-118 ; WIEDMER, J., « Les seniors, des passeurs de vie. In Enfinsenior ! », *Paris: Nouveaux débats publics*, 2010, p. 189-209

⁴¹ SZMIGIN, I., & CARRIGAN, M., « Time, consumption, and the older consumer: An interpretive study of the cognitively young. » *Psychology and Marketing*, 2001, 1091-1116. ;DITMANN-KOHLI, F. (2007). Chap 4 : temporal references in the construction of self-identity : a life span approach. Dans H. VISSER & J. BAARS (Éd.), *Aging And Time: Multidisciplinary Perspectives* (1er éd., p. 83-120). Baywood Publishing Company.

⁴² WARBURTON, J., & CROSIER, T. « Are we too busy to volunteer? The relationship between time and volunteering using the 1997 ABS Time Use Data. » *Australian Journal of Social Issues*, 2001, 36(4), 295-314

amount of time.⁴³ It seems fairly obvious that as death nears, not only does it hurry people to do what they want to do, but also reveals the fear of not having the time get it done before dying. For instance, people who have had near-death-experiences (NDEs) often find themselves motivated to make changes in their lives that they otherwise wouldn't have had the will to do.

You don't have to look very far in behavioral psychology to reveal the relationship between deadlines and motivation. Many studies have confirmed what we observe in everyday life: "For most employees, goals are more effective when they include a deadline for completion. Deadlines serve as a time-control mechanism and increase the motivational impact of goals. Being aware that a deadline is approaching, the typical employee will invest more effort into completing the task. In contrast, if plenty of time remains for attaining the goal, the employee is likely to slow down his or her pace to fill the available time."⁴⁴

Given how unique death is in its characteristics, it is understandable to worry about motivation were it to disappear. But is this fear well-founded, or, like many fears, instinctive, emotional, and not thought-out? What behaviors or activities do we think we will cease doing *for lack of time pressure* if death were to disappear? All of our behaviors can be divided into two categories:

- Acts that we want to realize, which means that they are driven by an intrinsic motivation, or a pull.
- Acts that we don't want to realize but that we have to realize (for various reasons), which means they are motivated by an extrinsic motivation, or a push.

We can already correlate the three types of pressure to these two types of action: the feeling of opportunity is the fuel for the actions we want to realize, the feeling of threat is the fuel for the actions that we don't want to do, and the feeling of urgency is a common fuel to both.

CAUSE	PRESSURE	EFFET : MOTIVATION
DEADLINE Moment + Change	Feeling of opportunity →	We want to do the things we want to do
	Feeling of threat →	We have to do the things we don't want to do
	Feeling of urgency →	We do things sooner rather than later

⁴³FRIEDMAN, W. J., & JANSSEN, S. M., « Aging and the speed of time », *Acta Psychologica*, 2001, 134(2), pp. 130-141.

⁴⁴ LUNENBURG Fred C., « Goal-Setting Theory of Motivation », *International journal of management, business, and administration*, Volume 15, Numéro 1, 2011, p.4

I'll continue my analysis like this:

- First we'll look at the effect of the pressure, in particular the sense of opportunity and urgency, on our motivation to do the things we want to do.
- And then we'll look at the effects of the pressure, in particular the sense of threat and urgency, on our motivation to do the things we don't want to do.

1) The motivational pressure do to things we want to do

First, let's look at the potential impact of these deadlines on our motivation to realize the things we want. These are therefore all the possibilities that make us want to seize them. Without death (and the sense of opportunity and urgency it elicits), would we delay the realization of such acts to the point of never doing them?

a. The case of acts we want to do, but that we wouldn't do without the pressure of a deadline

Let's suppose for now that there are possibilities for which our intrinsic motivation would be insufficient to make us pursue them and that they would therefore need the motivational supplement caused by the pressure of the biological deadlines. Why would we not pursue things that we want without the deadline of old age or death? This would be true if the deadline itself is the basis for the thing we want, or if the deadline, without necessarily founding the thing in question, caused a necessary pressure to make us want to realize it.

First of all, if the deadline is the basis for the desired action, then we can expect that if this biological deadline were to go away, the desire to act would too. But these actions exist only because the deadlines exist: for instance, we may have particular desire in relation to old age (wanting to live at home rather than in a pension) or to death (wanting to be buried in a particular location). These kinds of actions will presumably disappear from human experience in the post-human condition, but I don't think it's worth spending too much time on whether that is a good or bad thing.

However, if we're talking about activities that need a deadline in order for us to want to realize them, we may very well ask: does death itself make us want to live? Again, this may seem like a fairly reasonable question but it doesn't hold up to observation. When I go to the see a film at the theatre, I don't go because it's going to be taken down in a few weeks, but for other

personal reasons, mainly relate to the pleasure I'm expecting to get from watching this film in this location. This is the intrinsic motivation and it has nothing to do with the deadline. The fact that the movie will only be available for two weeks limits the window of opportunity and may very well precipitate my action, but if the film was in theatres forever, I'd still *want* to see it.

Clearly, the impermanence of an opportunity reinforces our desire for it and even perhaps our experience of it. Suppose I'm presented two identical biscuits: one will always be there, the other will be taken away in 10 minutes. The simple fact that one will be gone in 10 minutes may reinforce my desire for that biscuit, even though I still want both biscuits. Therefore, impermanence can enhance desire, but it can't be its unique source. So by taking the deadline away, we can only weaken desire, not kill it.

However, there will be some cases where our intrinsic motivation to pursue a possibility will be insufficient to realize it, and where we need the pressure caused by a deadline to do so. But then we may wonder why would our intrinsic motivation be insufficient? In other words, what could stop us from realizing something we want? There are two possible cases:

- First, our intrinsic motivation *is* strong enough but we are not able to realize our desire;
- Second, our intrinsic motivation *isn't* strong enough to overcome the obstacles to realizing our desire.

1. Cases where our intrinsic motivation is sufficient, but we are unable to realize the desire

How could we be absolutely incapable of doing something we want? First, if we have an intrinsic motivation to pursue two or more mutually exclusive things: if we chose one, we must give up on the others. In what cases could they be mutually exclusive?

On the one hand, competing options will be mutually exclusive because of their inherent deadlines; indeed, some possibilities will be mutually exclusive because of their own impermanence (such as going to two stadiums to watch two football matches at the same time). By virtue of choosing one, the other disappears. But this kind of situation will be exactly the same in a post-human world, so things won't change much here. Whether life is infinite or not, I fail to see why someone would rather stay home, rather than see one of the two games.

On the other hand, our inability to realize a desire may be due to the coexistence of several possibilities that don't have an inherent deadline, but that are mutually exclusive not because of their own impermanence, but because of our own. That's how things are now: we can't do

everything, there just isn't enough time in one lifetime. These possibilities may otherwise be permanent but they become mutually exclusive not because they expire but because we expire and we can't do them all. If I had all the time to visit all the places in the world, then hypothetically, if I wanted to I could. And so we can point out a certain kind of tautology here: seeing as I can't visit all the places in the world, my deadline gives me a pressure to choose only a few, but what prevents me from seeing all the places in the world, is my deadline. The deadline is justifying itself, in a way. Because without the deadline, I wouldn't need to make a choice and so I wouldn't need the deadline anymore either to motivate me to do one. Consequently, if we lived indefinitely long lives, and that some of the things we wanted to do were going to be around also, then there is no reason to believe we wouldn't do them all. Making a choice supposes a constraint - without the constraint, we don't need to forsake.

However, in this situation we could find ourselves in a state of paralysis: if we potentially have all the time to do all the things, then we would be unable to know where to start. Using the economic model of value as scarcity, if opportunities are in equal abundance, then we wouldn't know how to attribute value to things, we wouldn't be able to construct preferences and so everything would start looking value-less and we wouldn't do anything. Steven Cave, for instance, claims that if we had a potentially infinite life, we would be so paralyzed by the infinite possibilities that we would be left « wishing for a terminal deadline. »⁴⁵ This is somewhat similar to Heidegger's view that being means first and foremost being authentic, and authenticity can only be achieved if life is limited, for this limitation is what brings about choice (a choice about whether to live authentically or not). Without death, we would be unable to realize this authenticity.

But this again seems far-fetched to me. Each possibility has an inherent value that we can each appreciate. For instance, if I were able to see all the movies ever made in the world, that wouldn't stop me from being able to say which ones are more worth seeing, and so to start watching one instead of staying forever undecided. There are many places to go in the world, but there are only few truly extraordinary places to go in the world, and then few more great places to go, and many, many, uninteresting places to go. I fail to see how in a post-human world, people would be so confused as to be unable to pick between visiting the Machu Picchu or some suburb of Sheffield. If we have trouble making choices today in the face of ever expanding options, then instead of using deadlines and the future loss of possibilities as a motivator, we should instead learn to be better choosers and satisficers.

⁴⁵ CAVE, Steven, *Immortality: The Quest to Live Forever and How It Drives Civilization*, Crown; 1ère édition, 3 Avril 2012, 338 pages, p.172

2. Cases where our intrinsic motivation is insufficient in the face of obstacles

Now let's focus on possibilities that we want to do, but for which our intrinsic motivation is insufficient to overcome the obstacles in our way. These efforts, costs and risks will be greater than your desire, and therefore, whether the object of our desire is permanent or not, we need an extra pressure to get us to realize it. Studies tend to confirm for instance that as deadlines get closer, people are willing to take more risks. One study on children crossing the road in different situations⁴⁶ showed how the more they were being hurried by tighter and tighter deadlines, the more they risked their own safety (crossing in the middle of the road, running in front of cars, not looking for traffic). As such, in our current condition, biological deadlines provide this extra pressure: despite all the obstacles, the threat of menopause will push women to have children, the approach of old age will push people to cross out items on their bucket lists, and the constant threat of death may generally push us to overcome obstacles to get what we want before it's all too late. It is therefore quite legitimate to worry, in these cases, what will happen with our motivation to realize these actions if we don't have the pressure caused by biological deadlines.

I'll take a personal example here: in 2013, I backpacked for 3 months through South America. This was a possibility I had wanted for a while, that was relatively permanent (South America is going nowhere), but like all activities, this trip incurred costs (money, effort, time) and risks (going into unfamiliar and potentially dangerous territories, coming into contact with many strangers, using different means of transport, and so on). And so my intrinsic motivation had to be strong enough to make me want to bear the costs and take the risks. For this, I had both:

- Positive motives (the carrot): the pleasure of traveling, exploration, adventure, etc.
- Negative motives (the stick): if I wait too long to do this trip, I'll either be too old to enjoy it or dead.

So when I went, I was filled with the mantra that life is short and you should experience things to the fullest while you can. But this was the conclusion of an equation where costs and risks are weighed against the carrot and the stick. In order to act, the weight of the motives (determined by the carrot and the stick) must be greater than the weight of the obstacles (costs and risks). Therefore, if we take the stick away, that doesn't mean that the carrot is weakened, but it may mean that the terms of the equation change and that the carrot, by itself, won't be heavy enough to outweigh the obstacles. Perhaps death is a necessary pressure (stick) to infuse our motivation with the required intensity to bear the costs and take the risks to pursue some of the things we

⁴⁶ CHARRON et al. (2008), « Child Pedestrians' Deliberately Risk-Taking Behavior: Experimental Studies on Simulator and Developmental Outcomes », *Recherche Transports Sécurité*, 101, 239-251.

want. Without that stick, would the carrot be tasty enough to make us overcome these obstacles, to risk our lives for some of the greater things we want? In this post-human condition, perhaps in some cases the benefits will be sufficient for us to do what it takes; but in others, we may give up on some possible gains out of fear of accidentally ending our life. In his study of the temporal pressure caused by death, Kets de Vries writes:

“This knowledge about our impending death creates a conundrum whereby some people are so afraid of dying that they never really have the motivation to live. It is as if they tiptoe through life carefully, to arrive safely at death. [...] Our greatest tragedy is that we are motivated to find ways to suppress our fear of death, total annihilation, and definitive separation, but as this form of anxiety is caused by our wish to live, it makes it difficult for many of us to live our life to the fullest.”⁴⁷

He notices that the fear of death is but the flipside of our will to live. If we are afraid of dying, it's simply because we don't want our life to end. And so, paradoxically, this fear paralyzes us and prevents us from doing precisely what we want the most: live.

Therefore our willingness to take risks to achieve the things we want could be severely impacted by the transition from the mortal condition to the post-human condition. This change also impacts other features of life: if we don't die of old age or sickness, then all deaths will be accidental, unpredictable, unexpected and will strike people who were in peak condition and busy with their happy lives, meaning that the transition from state of the world A (being alive) to state of the world B (being dead) will be hugely negative every time. Today when a 25-year old dies, this implies a greater loss of possibilities than when a 90-year-old dies. Therefore, in the post-human world, death may be rarer, but it will be far more traumatic: we'll never be prepared for it and it will always strike at “the worst time” (because we will all be at the “best possible age”). Today already, there's a greater sense of tragedy when a young person dies than when an old one does. There's always sadness, but in the case of a young person's death, it's accompanied by a sense of shock (“we didn't see it coming”) and injustice (“he/she was too young, had so much yet to live for”); in the case of the old person, the sadness is mellowed by preparedness (“it's been coming”) and a sense of accomplishment (“he/she lived a full life”).

Therefore in the post-human condition, every death will feel like the death of a young person today – premature, unfair, traumatizing – and will reinforce our desire to avoid it at all cost: this will mean being extremely cautious and risk averse. If we can theoretically stay alive

⁴⁷KETS DE VRIES, Manfred, « Death and the Executive: Encounters with the “Stealth” Motivator », INSEAD, p.8

indefinitely without taking risks, then for each possible action, we will have to weigh our desire to reap the rewards of the considered activity against our desire to avoid dying. Some authors believe this is the chief reason why the post-human condition is not desirable: Leon Kass, for instance, who chaired of the US President's Council on Bioethics⁴⁸ under George W. Bush, believes that despite the possible hardships and sufferings of old age, "the health decline at the end of life makes death easier to face" and that the post-human condition, by robbing us of this "gentle and imperceptible slope", will be "a world increasingly dominated by anxiety over health and the fear of death."⁴⁹

What should we make of this extra-cautious hypothesis? First of all, the fact that death may strike only people who are otherwise healthy and busy with their lives doesn't necessarily mean that our fear of death will be stronger and completely inhibit our willingness to pursue our desires. If we look at people around us day : young people, teenagers and young adults, they are the people who spend the least amount of time thinking about their own mortality, and yet they are the ones who seem the most willing to take risks and seize the opportunities of life. Furthermore, if in the post-human condition death was always the result of unpredictable accidents, that shouldn't enhance our fear of death. Things could already end at any moment (I could have a stroke writing this word) and yet we don't live as though each moment was going to be our last. We act as though we had a certain amount of guaranteed time ahead of us in which to realize our projects. Otherwise, we wouldn't all just follow our impulses and that would be chaos. Order relies on the certainty of the future.

But more importantly, should we regret losing this "gentle slope" into old age that Leon Kass recommends? First of all, referring to the ailments of old age as a "gentle slope" that has the benefit of preparing us for death just seems such a wicked argument - I don't know anyone who upon learning that his house has been entirely burgled says: "Thank God I got my wallet and car stolen last month otherwise this would feel terrible." But shouldn't we precisely *want* death to be more unpredictable? After all, the slow decline into old age and natural death is itself the source of much real angst and suffering: by drawing us closer to an impending end, constantly weakening our abilities, teasing the total loss of possibilities by ever more partial ailments, this slow descent towards death causes many pains that are not compensated by any benefits other than perhaps, cornering us into finding the relief of acceptance. In the end, shouldn't we all want deaths to be unexpected and unpredictable? In the post-human condition, even if death does take us at a time when we still had infinite possibilities ahead of us, we will never have known the

⁴⁸Ce conseil, The President's Council on Bioethics, n'existe plus aujourd'hui - <https://bioethicsarchive.georgetown.edu/pcbe/>

⁴⁹KASS, L. « L'Chaim and its Limits », dans S.POST and R. BINSTOCK, *The Fountain of Youth*.Oxford: Oxford University Press. 2004, pp. 304-320., p.310

ailments of old age, nor the affront of resignation, nor the mental torture of expectation, and we will have up until then lived a long, healthy life. In other words, isn't it better to die in an accident after 300 years of a plentiful life than to slowly die in your sleep aged 85 after 20 years of progressive decline? If death became an unexpected and unpredictable event, wouldn't this allow people to more easily follow the epicurean philosophy: there's no point worrying about death, because as long as death isn't here, we are, and when death does happen, we won't be around to worry about it.

Furthermore, this idea that we would become entirely risk-averse seems to ignore the fact that because of some natural proclivities, some people enjoy taking risks. Why? Because people enjoy the benefits that you get from risky behavior, and more often than not, the higher the risks, the bigger the rewards. So long as people like rewards, people will take risks to obtain them. And these rewards can be of many sorts: they can be material, of course, but they can also be experiential. Will people who today like adventure tomorrow stay forever home? Take for instance Australian biologist Jamie Seymour who studies the most venomous animals in the world; following the accidental death of his friend Steve Irwin who was attacked by a stingray while shooting his TV show, journalists asked him if he thought about quitting his research. His response should be reassuring for those worried that human motivation would shriek in the face of risk: "Of course you become far more aware of the precautions you have to take and you can always make a mistake, but what am I going to do? Wrap myself in cotton wool and sit at home all day?"⁵⁰ Seymour is surely the kind of person that Robert Ettinger, a founding figure in the cryonics movements, was referencing when he spoke of his optimism:

"It has been conjectured that society would be emasculated, that new ventures would cease, that every citizen might eschew risks of all kinds - even refusing so much as to use vehicles for fear of an eventual accident. [...] This kind of development seems to me highly unlikely. In the first place, creative drives and competitive pressures will persist in some form [...] and] as always, those who refuse risks and challenges will probably sooner or later be trampled into the ground."⁵¹

Finally, even if death in the post-human condition does only strike people who are healthy and therefore is even more traumatic on the whole, we can also expect that it will become something that is not only accidental, but also extremely rare, thus lowering its presence

⁵⁰ Extrait d'un documentaire télévisé australien, disponible sur Internet : <https://www.youtube.com/watch?v=SP6TB8kiZB0>

⁵¹ ETTINGER, Robert, *The prospect of immortality*, Ria University Press, 2005, p.131

in the collective conscience and unconsciousness. Not only will our bodies be more resistant, but our medicine and technology will allow us to better treat and heal, and more importantly, everyday life will surely be safer (many activities that today are the source of many accidental deaths will surely get safer and safer, such as transportation). This would lower the costs and risks to consider in the pursuit of a given desire, thus perhaps re-balancing the equation so that the carrot is sufficient motivation to pursue it.

However, given the unique nature of the “ultimate pressure “caused by death, we have to recognize the possibility that, without that biological deadline, some obstacles will be too great and thus prevent the realization of some possibilities that would have been pursued with this added pressure. And of course, given that some of these possibilities could be wonderful things (such as a trip, or revealing your feelings to someone), this would be a shame, because an unexplored opportunity is just as dissatisfying, if not more so, than one that never existed. But first of all we would need to identify in which cases this would be true, and there’s reason to suspect there will be few such instances, but more importantly, so what? Perhaps this loss is a justifiable price to pay in order to have more time to know more possibilities.

Unfortunately, this question of the virtue of death for the motivation of some of the most rewarding experiences in life often gets portrayed by a fairly simplistic opposition: we can either have a short and intense life, or a long and boring one. Culture is indeed filled with the ideal to “live fast, die young,” as though a longer life had to be dull one. Perhaps some people will gladly live fast, stay young and die old.

And so supposing that there are some extreme cases where death causes a pressure without which the possibility would not be pursued, and further supposing that this would be a shame insofar as these possibilities would yield positive experiences, is that enough reason to stay in the mortal condition? The fact that a negative condition gives rise to a positive result does not imply that this negative condition be maintained or desired. There’s no doubt that a person who is diagnosed with terminal cancer and has months to live will find herself filled with a pressing motivation to do many things she otherwise wouldn’t have felt, and will subsequently experience every event in her shortened time with an intensity that perhaps healthy people will never get to know, but should we envy her cancer? Isn’t it better to love one’s spouse with regular levels of emotional intensity for 20 years than with desperate passion for 2 months before a premature end?

Ludwig Wittgenstein imagined immortality differently: “Death is not an event of life: we don’t live the experience of death. If we conceive of death not as an infinite temporal duration but as eternity/atemporality, then eternal life belongs to those who live in the present.” Those

who worry that a longer life would mean a slower one fail to realize that those who are most excited about radical life extension are often the most fast-paced, adventure-seeking people: it's precisely because they live fast that they realize just how much they will not have the time to do, no matter how fast they go, and so they want more time to live *more*. More future simply means more "present moments" to enjoy and there should be no shame in wanting more of them. And yet, this is precisely what many radical life extension advocates are met with, a strange kind of abnegation and a frankly baffling scorn for wanting more.

It's worth here taking into consideration Parkinson's law,⁵² whereby we people naturally contract or spread out the efforts needed to achieve a goal so as to fill the time they have at their disposal.⁵³ For instance in one study,⁵⁴ several groups of students were given the same series of math problems to solve in a limited time, but each group had more or less time. The study found that the students who had twice as much time systematically took more time to solve the problems. As a result, Parkinson's law is often summarized like this: the more time we have to do something, the more time we will take to do it. If we apply Parkinson's law to life, then this reasoning would legitimately be a concern, for we could take an endless amount of time to do things that today are done quickly.

But this may be one of the greatest points of confusions leading to the fear of laziness: sure, if we took 500 years to do what we typically do in 80 years, then indeed there would be a lot of wasted time in there. But do we seriously think that this is how people would live? Isn't it more likely that with an open, indefinitely long future, people would have projects and ambitions that go way beyond our current temporal limitations, projects and ambitions that would correspond to the larger timescales we could invest?

Meanwhile, it has been observed⁵⁵ that the proximity of a deadline influences the perception of the difficulty of the task at hand: subjects with shorter deadlines reported harder goals to achieve than those given longer deadlines. Therefore, with more time, some goals will seem less difficult to achieve, and we will thus be more motivated to put in the effort to achieve them. While some may worry that lengthening indefinitely our prospective future might lower the pressure to pursue some of our goals, it may also give us the necessary motivation to pursue some goals that we today we either feel incapable of pursuing for lack of time, or that we can't

⁵²PARKINSON C. N. (1958), Parkinson's Law. The Pursuit of Progress, London, John Murray

⁵³LAWRENCE H. PETERS, EDWARD J. O'CONNOR, Abdullah POOYAN and JAMES C., « The Relationship between Time Pressure and Performance: A Field Test of Parkinson's Law », *Journal of Occupational Behaviour*, Vol. 5, No. 4 (Oct., 1984), pp. 293-299, p.293

⁵⁴BRYAN, J. F. and LOCKE, E. A. (1967).« Parkinson's Law as a goal-setting phenomenon », *Organizational Behaviour and Human Performance*, 2, 258-275.

⁵⁵BRYAN, J. F. and LOCKE, E. A. (1967). 'Parkinson's Law as a goal-setting phenomenon', *Organizational Behaviour and Human Performance*, 2, pp. 258-275.

even imagine because of our limited temporal field. With more time, people can extend their horizon of action. They can make long term investments of resources (money, energy, thought, planning, etc.) over hundreds of years, people can accumulate centuries of experience and knowledge and collaborate or compete with similarly experienced individuals. The post-human world won't come to a standstill because post-humans won't have the time to stagnate.

b. Cases where our intrinsic motivation would be sufficient even without a deadline

Now let's look at the influence of the biological deadlines on our pursuit of possibilities for which our intrinsic motivation would be sufficient for us to pursue them (there is no mutually exclusive situation between the possibilities, and the obstacles are low enough for us to pursue them without the need for the pressure of any deadline): in other words, whether there is a deadline or not, we would pursue these possibilities. What would the post-human situation mean for our motivation in relation to these possibilities?

The first thing to notice here is that biological deadlines are unnecessary. Suppose I have a biscuit in front of me, I want to eat it, and I'm told that the biscuit will be taken from me in 10 minutes if I don't eat it. Well, the presence of the deadline may precipitate the moment at which I eat the biscuit, because it would indeed be a shame not to enjoy the biscuit while it's there, but even without the deadline, I'll still eat the biscuit, just maybe at a later time that suits me better, for whatever reason that may be. So in such cases, the deadline is not only unnecessary for our action, but worse, it is harmful: either it pressures us to act earlier than what we would have deemed the optimum time to do so (thus preventing us from gaining maximum benefits from the activity), or it makes no difference, making us act exactly when we would have otherwise done and adding nothing more than the satisfaction of not having overrun the deadline.

Therefore, in these types of situations where our intrinsic motivation would be sufficient to pursue the act without the deadline, there are reasons to believe that the mere presence of the deadline is harmful both before and after the realization of the act: before, it can negatively affect people's motivation and state of mind, and after, it can damage the performance and experience of the act.

First of all, the pressure caused by the deadline of death can be so strong it suffocates motivation. Indeed, the authors of TMT point out that "knowledge of the inevitability of death gives rise to the potential for paralyzing terror which would make continued goal-directed

behavior impossible.”⁵⁶ Similarly, psychologist Leslie Becker-Phelps believes that “deadlines can murder motivation” seeing as “external motivation, while sometimes helpful, can also undermine intrinsic motivation. When someone is doing something because they like it, you can lessen their intrinsic motivation by [...] providing other external motivation - like deadlines.”⁵⁷ As such the nature of the motivation changes: without the deadline, it is expressed as “I want this biscuit at the moment of my choosing,” whereas with a deadline it becomes “I have to take this biscuit now before it’s too late.” What was purely a desire (eat the biscuit when I want) becomes tinted with obligation (eat the biscuit while I can).

Moreover, these deadlines are all perceived in a negative way. For instance: “After menopause, I won’t be able to have children” or “After I’m too old, I won’t be able to play football” or “After death, I won’t be able to do anything.” Studies have shown that the appreciation of a deadline, or a pressure, influences on the person’s reaction to it. Dean Ornish, founder of the Preventive Medicine Research Institute, explains that to help people with bad habits change their behavior (such as smokers), it is less effective to threaten sanctions if they continue their bad habit than it is to promise rewards for changing it. According to him, people’s motivation is far more stimulated by the appeal of potential gains than it is by the threat of probable pains. As such, given that biological deadlines are internalized by most people in terms of losses and not as gains, they motivate in a negative way, thus causing harmful states of mind. Szollos makes a distinction⁵⁸ between two components of temporal pressure: on the one hand, time shortage, which is the recurrent awareness of not having enough time, and on the other hand, the sense of being rushed, which is an emotional experience of agitation, urgency and expediency in the execution of tasks that breeds affective correlates such as the loss of control, anxiety and frustration.

It should be noted here that the idea of pressure itself is not inherently a good one, as it relates to psychological ailments such as tension and stress. It’s interesting to note the diverse constellation of words that are routinely used to discuss the idea of time pressure and how they all in some way express an unpleasant feeling: “*time scarcity*”, “*time squeeze*,” “*time shortages*,” “*feeling of being harried*” or “*time urgency*”.⁵⁹ These are not positives in the experiential landscape and we can therefore assume that deadlines are generally not the source of well-being. It’s no surprise that

⁵⁶ PYSZCZYNSKI, Tom, GREENBERG, Jeff et SOLOMON, Sheldon « Why Do We Need What We Need? A Terror Management Perspective on the Roots of Human Social Motivation », *Psychological Inquiry*, Vol. 8, No. 1 (1997), pp. 1-20; p.2
⁵⁷<http://www.psychologytoday.com/blog/making-change/201003/how-deadlines-can-be-murder-motivation>

⁵⁸ S. COEUGNET et al., « La pression temporelle : un phénomène complexe qu’il est urgent d’étudier », *Le travail humain*, 2011/2 Vol. 74, p. 157-181, p.163

⁵⁹ GOURMELEN, Andréa, « La pression temporelle ultime : conceptualisation et influence sur les motivations au bénévolat des retraités », Thèse présentée à l’Université de Bretagne Occidentale le 18 novembre 2013, p.94

time pressure is often the subject of many complaints. Several studies⁶⁰ have found that temporal pressure and distress often go hand in hand, in particular in the workplace where increased time pressure (due to increased demands, higher goals, etc.) leads to more conflicts and stress. In his study on the motivational effect of the temporal pressure caused by death, Kets de Vries notices that dealing with our knowledge of death, « some of us go into overdrive in trying to suppress it, while others fall into a state of resignation and depression.»⁶¹ When people's will isn't entirely crushed by the weight of the deadline, he found that one of the ways people often deal with the anxiety of death is what he calls the "manic defense" which manifests itself by workaholism, often causing in turn moral anxiety, depression and burnout. Susan Roxburgh points out⁶² the significant presence in American media and public discourse of how time pressure affects every day life and contributes to the decline in quality of life.⁶³ Indeed, studies on American's rhythm of life show that people who are constantly in a rush, or who report feeling pressured by time, also confess great dissatisfaction with their lives as well as lower mental and physical health.⁶⁴

Furthermore, TMT further argues that death can motivate us to have behaviors that are not necessarily conducive to greater well-being: some defense mechanisms against the awareness of death can lead to stereotyping, in-group favoritism, nationalism, materialism.⁶⁵ Without an unavoidable death in sight, perhaps we won't need to have such strong defense mechanisms reinforcing our cultural value systems, and therefore perhaps we will be able to have a more assured appreciation of our life that would be fuelled by the comfort of a secure life and not the fear of an impending death.

Furthermore, these negative psychological effects in turn impact the quality of the performance and of the experience of the act itself. Let's go back to the example of the biscuit: suppose that instead of there being one biscuit, I have been given a plate covered with a mountain of many different biscuits. If I am free to eat these at my own pace with no risk of these biscuits disappearing (or going stale), then I can eat a few now, then a few later, and if I manage my consumption well, I can space out each biscuit so that each one will give the maximum potential amount of pleasure. What will happen, however, if I'm told that I only have 10 minutes in the presence of this plate of biscuits? I will probably hurry to eat as many as I can,

⁶⁰ ROXBURGH S., « There Just Aren't Enough Hours in the Day. The Mental Health Consequences of Time Pressure, » *Journal of Health and Social Behavior*, 2004, 45, 115-131 ; GREENHAUS J.H., & BEUTELL N. J., « Sources of Conflict Between Work and Family Roles », *Academy of Management Review*, 1985, 10, 76-88.

⁶¹ KETS DE VRIES, Manfred, « Death and the Executive: Encounters with the "Stealth" Motivator », INSEAD, p.3

⁶² Susan ROXBURGH, « There Just Aren't Enough Hours in the Day': The Mental Health Consequences of Time Pressure », *Journal of Health and Social Behavior*, Vol. 45, No. 2 (Jun., 2004), pp. 115-131, p.115

⁶³ GLEICK, James., *Faster: The Acceleration of Just about Everything*. New York: Pantheon Books, 1999

⁶⁴ ROBINSON, JOHN P. and GODBEY. *Time for Life: The Surprising Way Americans Use their Time*. University Park: The Pennsylvania State University Press, 1997

⁶⁵ MAHESWARAN Durairaj, et AGRAWAL, Nidhi, « Motivational and Cultural Variations in Mortality Salience Effects: Contemplations on Terror Management Theory and Consumer Behavior », *Journal of consumer psychology*, 14(3), 213-218, p.213

choosing those that look the most delicious and discarding the rest. In doing so, there's a big chance that I'll quickly feel stuffed and that I'll try to eat more biscuits in those 10 minutes that I would ideally want thus preventing me from gaining the maximum possible satisfaction that these biscuits could have given me.

Consequently, by causing a sense of urgency, the deadline precipitates action, thus affecting the quality of the experience. As such, "when deadlines are too tight, particularly with complex tasks, the quality of work may suffer."⁶⁶ A meta-analysis on the effects of temporal pressure on performance found that "as expected, time pressure facilitated speed but impaired accuracy for both perceptual and cognitive tasks."⁶⁷ Moreover, several studies⁶⁸ show that while deadlines do help achieve goals, there is loss of quality in the process leading to the result. For instance, Illich's law⁶⁹ (or principle of decreasing returns) shows that as people get closer to a deadline, their quantity of work and effort increases, but the usefulness and quality of their work decreases. In other words, temporal pressure which is increased as deadlines loom leads to decreased effectiveness. For 5 years Andrews and Farris⁷⁰ analyzed the impact of temporal pressure on the productivity of scientists and engineers at NASA and found that in terms of innovation and output, their performance under time pressure only increased up to a certain point, after which it dropped under too much pressure. When people feel that they have too many things to do before the deadline that cannot be pushed back, they have a tendency to lose their motivation rather than hurriedly botch a task or only partially accomplish it. If we apply this to life, perhaps death is today a deadline that precipitates the realization of activities and saps motivation, and that if it were removed, people would have more time to do things better.

Furthermore, in the post-human world where there would presumably always be more time to push deadlines back, everything will become an opportunity to learn and reform. Lack of time will never be an excuse to not start a project, and however long it takes, whether or not they fail, they will be useful experiences for future project that could be just as long or even longer.

I can't help but think of my own personal situation, at this very moment: what is pushing me right now to write these lines as I'm sitting at the kitchen table of a camper van that's currently driving through northern Scandinavia with a group of friends? There's no doubt that the deadline to hand it in, which is in less than 5 weeks, is partly to blame. Clearly if I could get a

⁶⁶ LUNENBURG FRED C., "Goal-Setting Theory of Motivation", *International journal of management, business, and administration*, Volume 15, Numéro 1, 2011, p.4

⁶⁷ J.A. SZALMA, P.A. HANCOCK, and S. QUINN, « A meta-analysis of the effect of time pressure on human performance », *Proceedings of the Human Factors and Ergonomics Society Annual Meeting 2008*, Abstract

⁶⁸ Marco PINFARI, « Time to Agree: Is Time Pressure Good for Peace Negotiations? », *Journal of Conflict Resolution*, 2011; Clara Ponsati, « The deadline effect: A theoretical note », *Universitat Autònoma de Barcelona, Bellaterra (Barcelona)* 08193

⁶⁹ ILLICH I.D. (1974), *Energy and Equity*, London, Calder & Boyars

⁷⁰ ANDREWS, F. M. and FARRIS, G. F. (1972). « Time pressure and performance of scientists and engineers: A five-year panel study », *Organizational Behavior and Human Performance*, 8, 185-200.

few extra weeks to work on it, I would rather enjoy the scenery. But why did I accept this trip in the first place? Because I realized that the chances of going on a road-trip to see the midnight sun with some of my best friends at an age where we are still unconstrained by families and physically able to handle some arduous adventures would possibly not present itself again. I didn't want to miss this opportunity. But the same thing applies to life in general: I'm 27 and I find myself accumulating time-consuming projects, such as two parallel Master degrees and starting a film project. Why? Because I'm aware that success in any one of these avenues often hinges on achievements you make between the ages of 25 and 35. The only reason I'm trying to pursue these projects simultaneously is because I know my time is running out, and I want to do them all. Sure, I could chose, and I'm sure eventually I will. But as I write about the question of motivation in a post-human world, I cannot help but feel that if I could be afforded more lifetime, I would happily pursue all of these projects, to the fullest, one after the other, over perhaps several current lifetimes.

The problem here is that trying to pursue these projects simultaneously may be negatively impacting the quality of my work. Allotting time to several projects necessarily means sharing my attention, my energy, my creativity in such a way that each of these projects will suffer from my pursuit of the other ones. If, for instance, I focused solely on this philosophy paper, I could afford it many more hours of research and writing and editing and it could then be better than it is; similarly, if I spent more time focusing on my film project, I would also be able to make it in better conditions, spend more time planning the plot, focus more of my energy into learning how to use the equipment, and in the end the result would surely turn out better than it otherwise will. In short, while the deadline of death is undoubtedly forcing me to act sooner on all these projects, my unwillingness to compromise with them is making me sacrifice some quality in the realization of my projects. There are only two ways to correct this situation: either chose, or have more time. The first option is worth following if the second one is impossible; if the second becomes possible, the first one is pointless.

If there were not biological deadlines constraining my future, I wouldn't lose the desire to pursue these projects; instead, I could space them out, or do one after the other, and thus not only give each one of them my all but also reap maximum possible rewards from each endeavor. The deadline is not what makes me want to do these projects; what makes me want to pursue them is well... that I want to pursue them. The deadline is only pushing me to pursue them with suboptimal organization.

However, some people will find here another possible source of standstill: perfectionism. Without a deadline, we would be tempted to literally take all the time in the world to work on our

projects, endlessly seeking a perfection that we will never achieve and thus inevitably ending up dissatisfied with our work and giving up before ever completing it. Not only would we come to a standstill, but we'd be perpetually frustrated and bitter. I can't here spend too much time focusing on perfectionism, other than to say that perfectionism is a human attribute that seem unrelated to the existence of a deadline and one that will happily counteract another even more common attribute, which is to do the bare minimum.

2) Biological deadlines and the motivation to do things we don't want to do

Now let's see how biological deadlines influence our motivation to do things we don't want to do. What kind of behavior are we talking about here? It would be any act that requires a level of effort that is greater than the intrinsic interest of the act itself and that therefore requires the pressure of the deadline of death as an external constraint.

a. The need for the deadline

First of all it's worth pointing out that there are many things that we don't want to do, but we don't do them because of the time pressure caused by death. Other deadlines provide the time pressure. For instance, I don't want to do my dishes, but I do it because if I don't, sooner or later I won't have any clean dishes to eat on. However perhaps our motivation to do all these acts we don't want to do ultimately rely on the pressure of death to be performed. In the case of dishes: why do I feel the need to do my dishes? Because I need clean dishes. Why do I need clean dishes? Because if I only eat on top of old rotting food I could get sick and die.

Simply put, we feel an obligation to do things we don't want to do because we feel threatened by the negative consequences of not doing them. And in this case, the threat of death won't be entirely gone in the post-human world: while our bodies may be more resistant than they are today, we will still need to do some things in order to stay alive. And if there are some things that we today don't want to do, that are not required anymore in the post-human condition, then there will be no reason to do them, and that's not a bad thing. Other possible negative states will also serve as latent threats that people will seek to avoid by doing things they don't necessarily want to do, such as the threat of not having any money and becoming homeless.

However, there could be some acts that we don't want to do and that are *directly and exclusively* motivated by the threat of death. In a state of nature, for instance, when humans lived

in tribes, almost all of their acts were motivated in this way. Hunters probably didn't want to chase wild bores, but they had to otherwise they'd all starve. In modern civilized society, this imminent pressure of death is removed. Paid work is probably the most common kind of act that many people don't want to do but have to under threat of not being able to support themselves and ultimately, dying.

The post-human world won't really change in this respect: people will still need to buy food and water and pay for rent and transportation. Death may not be a fatality, but life won't be free. Work will be motivated not by the certainty of a future death, but the constant potential of death if certain acts are not performed.

However it is possible that this post-human condition lowers the « cost » of staying alive: for instance, if we don't get sick, we won't have as many medical costs as we do now, not to mention the fact that all age-related diseases will have disappeared. But let's go further: let's suppose that the post-human condition transforms the body in such a way that it needs far less inputs to sustain itself (less water, less food, etc.) and that machines produce the entire stock of vital needs; in short, let's imagine a situation where it would be possible, without doing any work at all, to stay alive and healthy indefinitely. Would we ever feel the motivation to work on tasks we don't want to do?

Well, for all the activities that would today be directly required for substance, such as plowing fields, maybe not. But then – so what? If robots are doing it, and the cost of the produce is proportionally lowered, then we can happily unburden ourselves from those tasks. But what about the jobs that people feel motivated to do because they have an intrinsic interest in them. Let's take the job of an architect for instance: this is a job that requires a certain level of effort but that has an intrinsic interest. Some architects perhaps don't like their job, and for them, the intrinsic interest of the job wouldn't be sufficient in a post-human world to do it; but for others, those whose interest in the activity is greater than the effort required to perform it, they will be motivated to be architects even without death simply because it will become an activity they want to do.

Furthermore, in the post-human world there will still be many other reasons to work on tasks we don't want to do than purely to stay alive, such as benefiting from the result of that work. The disappearance of a certain type of work is only damageable to society if that work was useful to society. Let's take the case of a factory worker on an assembly line building cars who doesn't like his job. He's motivated to work because he needs the money, without his job he'd not have any resources to buy food and shelter and could end up dying. But if he could live a healthy sustainable life without doing this job, he'd gladly do so. But because the factory needs

workers and because society needs cars, if these workers stop working because they don't need to anymore to survive, this loss of workers will be a problem for the factory and ultimately for society, because the production of cars would be halted.

In this case, then, we collectively have a choice: either we decide that cars are not worth it and we stop making them, or we deem cars too useful to make do without them and a solution will then have to be found. In the case of making cars, there are only two options: either factories become fully automated, therefore never requiring any human hands in the construction of the car. But let's suppose, for the purpose of the discussion, that at some point in the chain human input is required. How do we get them back to work? How to motivate an effort that is not wanted or required to survive?

Well, this post-human world only has two options: either it provides other sources of motivation for humans to provide that effort, such as better incentives (like a higher salary) or society "reinstates" the threat of illness and death to force people into work, which clearly would be ethically reprehensible. Some will say that the success of capitalism is built on proximity of the working-class to death: indeed, the only reason masses of people will perform the most thankless tasks for the least amount of money is because they would otherwise die very quickly. If they were suddenly pulled out of their precarious state and thus removed from the imminent threat of death, they wouldn't see their working conditions as acceptable. In other words, it may very well be more cost-effective for society to maintain the threat of death than to remove it and find better incentives. Can we justify such a situation? It would be a bit like saying that malaria, that kills millions of people in Africa, is a good thing because it helps fight overpopulation. The fact that finding a solution to overpopulation isn't an easy task doesn't mean that we shouldn't look for one all the while fighting against malaria. As a result, if we are able to prevent death, the fact that it may be costly to society cannot be a sufficient justification to not do so. If society could lift the burden of death, then the response to that isn't to slow down the change so that it is economically effective, it is to change the economy, either by automating the work, or by providing greater incentives. Motivating people to do something they don't want to do by benefitting from their vulnerability to death is a form of human exploitation, and any unwillingness to relieve that burden on economic grounds would be criminal.

b. The fear of procrastination

In the context of acts that we wouldn't want to do without the pressure of the deadline, one of the most obvious and common fears in relation to radical life extension is procrastination.

According to Piers Steel who authored one of the most exhaustive studies on this behavior, “procrastination is a prevalent and pernicious form of self-regulatory failure [...]. Strong and consistent predictors of procrastination [are] task averseness, task delay, self-efficacy, and impulsiveness”⁷¹ among others. What makes procrastination so particular is that it requires “voluntarily delaying an intended course of action despite the expectation of being worse off for the delay.”⁷²

Of course, the deadline plays a key part in our motivation to accomplish this kind of act and it has been shown that procrastination can negatively affect the quality of the performance. In a study by Klaus Wertenbroch and Dan Ariely in 2002, three groups of students were given three homework assignments: the first group were told to hand in the assignments in three weeks; the second group set their own deadlines; and the third group were given three equally spaced deadlines. Unsurprisingly, the third group got the better grades and the first group got the worst. Already in 1997, Diane Tice and Roy Baumeister studied university students to evaluate the effects of procrastination on their academic performance, their levels of stress and their general well-being over the course of a semester. In the early parts of the semester, those who pushed deadlines back reported higher levels of well-being (partly because they were spending more time on more immediately gratifying activities) but by the end of the semester, they had less good grades, higher stress levels and lower well-being.

There is no doubt that procrastination is not a good behavior and it would surely be around in a post-human world. The challenge will still be the same: how to curb it? As O’Donoghue and Rabin point out, most people who have managed to regulate their procrastinating do so “not because of intrinsic self-control, but because they have developed schemes to overcome procrastination”⁷³. As several studies have shown,⁷⁴ people can use different techniques to drastically reduce procrastination. Another study⁷⁵ confirmed that procrastinators that are aware of their lack of self-control attempt to prevent this behavior by imposing deadlines on themselves, but also showed that self-imposed deadlines are not as effective as externally imposed deadlines. However, there’s no reason to believe that, aside from old age and death, such external deadlines would cease to exist in the post-human condition.

⁷¹ STEEL, Piers, « The Nature of Procrastination: A Meta-Analytic and Theoretical Review of Quintessential Self-Regulatory Failure », *Psychological Bulletin*, 2007, Vol. 133, No. 1, 65–94, Abstract

⁷²*Id.* p.88

⁷³O’DONOGHUE, T., & RABIN, M. (1999). « Incentives for procrastinators ». *Quarterly Journal of Economics*, 114, 769–816, p.807

⁷⁴AINSLIE, G. (1992). *Picoeconomics: The strategic interaction of successive motivational states within the person*. New York: Cambridge University Press ; BAUMEISTER, R. F., HEATHERTON, T. F., & TICE, D. M. (1994). *Losing control: How and why people fail at self-regulation*. San Diego, CA: Academic Press.

⁷⁵ARIELY, Dan, et WERTENBROCH, Klaus, « Procrastination, deadlines, and performance - Self-Control by Precommitment », MIT & INSEAD, Abstract

Individuals, institutions and governments can still be empowered to set, administer and enforce deadlines.

Moreover, according to Knaus⁷⁶ procrastination usually involves the following feelings: a desire to avoid the task, a decision to push it back, a promise to do it later, an engagement in substitutive diversion activities and fallacious excuses designed to justify the delay and avoid blame. Researches studying procrastination found that «procrastination appears more like a failure of self-regulation, such that compared to non-procrastinators, procrastinators are less able to resist social temptations, pleasing activities and immediate rewards.»⁷⁷ It is interesting to find in the data Steel has collected from many studies on procrastination⁷⁸ that approximately 80-90% of university-level students claim to procrastinate, with 75% reporting that they do so frequently, claiming that a third of their daily activities is procrastination. Instead of working, they sleep, or play, or watch television.

But what are these procrastination behaviors? Are they inherently bad? Should we think it's bad for people to sleep or play if they can avoid doing things they don't want to do?

c. A suspicion of idleness

The fear that in a post-human world people would lack the pressure to do things they don't want to do often feeds off the belief that human beings have a natural idleness that would fully express itself without the pressure of biological deadlines.

First of all, is there good reason to believe we would be so idle? We have already established that in this post-human world, we will still be motivated to do the things we want to do because the inherent interest will be strong enough; and we will still be motivated to do many of the things we don't want to do because there will still be plenty of reasons to do them.

If we suspect that in this post-human world, we would be lazy and lethargic, it's really because if we imagine ourselves, as we are now, in a world where we could afford to be idle, we would, because we are tired. If today we behave lazily in our down time, in the evenings after work and over the week-ends, it's perhaps precisely because we are exhausted by the weeks work, not because we don't want to do anything. We are used to functioning regularly under stress and so we have a hard time imagining what a less stressful life would be like. But we all did, once: we

⁷⁶ KNAUS, W. J. (2000). « Procrastination, blame, and change. » *Journal of Social Behavior and Personality*, 15, 153–166

⁷⁷ RABIN, L.A., FOGEL, J., & NUTTER-UPHAM, K.E. « Academic procrastination in college students: The role of self-reported executive function. » *Journal of Clinical and Experimental Neuropsychology*, 201, 33, 344-357, p.345

⁷⁸ STEEL, Piers, « The Nature of Procrastination: A Meta-Analytic and Theoretical Review of Quintessential Self-Regulatory Failure », *Psychological Bulletin*, 2007, Vol. 133, No. 1, 65–94, p.65

only have to remember what it was like before the stresses of adult life took over, when we were younger, teenagers and kids.

Would this be a bad thing? To be liberated from the need to work and free to be idle? This fear rests upon a glorification of effort and work, the flipside of which is a condemnation of idleness, that is a direct reflection of the mindsets of modern capitalism. Indeed, “capitalism, with its emphasis on the relentless pursuit of consumer goods, is responsible for the pervasive sense of busyness.”⁷⁹ TMT confirms this bias by explaining why we might have this fear of idleness: one of the strongest defense mechanisms against the existential terror of death is maintaining high self-esteem, which can be achieved by having the feeling of living up to the core standards and values of our cultural worldview.⁸⁰ And among the cultural values that we hold high today is effort, work, productivity. If you work hard, if you don’t give into the temptation of resting or having useless fun, then you embody in your own eyes the shared standards of your culture and this feeds your self-esteem. As a result, people who are lazy or who procrastinate just to be idle often report low self-esteem. Therefore, if self-esteem and therefore the behaviors that feed our self-esteem are so intimately linked to the fear of death, then if the threat of mortality is removed, so to is the need to engage in these behaviors: as such we would stop working and be idle.

But perhaps in the post-human condition, our cultural worldview will come to change, in such a way that effort and work is not glorified in the same way. In a world where survival isn’t the prime motivator but living well is, other values will be elevated in the cultural worldview, and perhaps learning how to take one’s time to enjoy one’s time will be elevated to a higher standing than it is today.

I will end here on Kierkegaard’s comments, that will serve as a perfect transition to the third and last part:

“We are used to saying that idleness is the mother of all evil. We recommend work to avoid evil. [...] Idleness isn’t the mother of all evil, quite the contrary, it is a divine life when it doesn’t come with boredom. [...] Boredom is the mother of all vices and that must be kept at bay. Idleness isn’t bad and we can say that whoever feels otherwise proves in doing so that he/she hasn’t elevated his/herself to the humanities.”⁸¹

⁷⁹ SCHOR, Juliet B, *The Overspent American: Upscaling, Downshifting, and the New Consumer*, New York: Basic Books, 1998

⁸⁰ PYSZCZYNSKI, Tom, GREENBERG, Jeff et SOLOMON, Sheldon « Why Do We Need What We Need? A Terror Management Perspective on the Roots of Human Social Motivation », *Psychological Inquiry*, Vol. 8, No. 1 (1997), pp. 1-20, p.2

⁸¹ KIERKEGAARD, Soren, *Ou bien... Ou bien...* [traduit aussi par *L’alternative*], « La culture alternée. Essai d’une sage doctrine sociale » Ed. Bouquins, p. 250

IV – A loss of motivation because of a loss of interest

Another potential loss of motivation in the post-human world could come as the result of infinite time on the quality of experiences. Indeed many people worry that if we had unlimited time to do all things, then sooner or later we'd lose all interest. And seeing one of the main reasons we do things today, and which would become the main reason to do things in the post-human world, is to enjoy the things we get to live, if we lose interest, then we won't want to do things anymore. A total lack of interest would lead to a complete lack of motivation.

This objection rests first and foremost on the general premise that impermanence is necessary for things to have any value in the first place. In order for us to appreciate what life has to offer – that is for relationships, activities and belongings to have value to use – we must be aware that they will disappear. Finitude would be constitutive of value, and so inversely, a potentially infinite life would be devoid of value. This side of the argument isn't what I'm going to focus on here, mostly because it has already been widely discussed in philosophy, and it has partly been addressed in the previous section. The post-human world will still be filled with enough impermanence to fuel our experiences with the necessary value for us to cherish them.

But it rests on a second assumption that will be of greater interest here: when people imagine the post-human world with a potentially infinite lifespan ahead of them, many worry that they will grow tired of things that are of interest to them, get bored and eventually lose the will to do anything.

A – The fear of weariness, boredom and laziness

1) Definitions

First of all, it's important to know exactly what we're talking about here and a few conceptual boundaries are in order, because several ideas such as weariness, boredom and laziness can be easily confused.

First of all, boredom is defined by the French Technical Dictionary as a “feeling of tiredness, of helplessness caused by inaction or a total lack of interest”⁸² and by Merriam-Webster as “the state of being weary and restless through lack of interest.”⁸³ Here we see the relationship between boredom and weariness as well as the link between lack of interest and loss of

⁸²Centre National de Ressources Textuelles et Lexicales - <http://www.cnrtl.fr/lexicographie/ennui>

⁸³<https://www.merriam-webster.com/dictionary/boredom>

motivation. Weariness is defined by the Larousse French Dictionary as a state of great physical and/or moral tiredness, while the the American Heritage Medical Dictionary defines being weary as “having one’s interest, forbearance or indulgence worn out.”⁸⁴ And finally laziness is defined by the Larousse French Dictionary as the behavior of someone who “avoids effort, work, activity, who has a penchant for idleness or who lacks energy in performing an act.” From these definitions, we can further specify:

1. **Weariness** (in French, *lassitude*) is a tiredness that comes from repetitive activity (for instance, if I play cards for 5 hours, I will grow weary of this activity). This is a non-desire to continue doing something that was possibility interesting to begin with and this can occur without there being any change in the activity’s features – we just lose interest out of repetitiveness.
2. **Boredom** (in French, *ennui*) is a loss of interest caused by :
 - A. A lack of available activities: we are bored because there’s nothing to do. The subject has a desire to be active, but there’s nothing to do, his desire is frustrated and so he loses interest.
 - B. The engagement in an activity that:
 - Is not inherently interesting (such as counting rice)
 - Was inherently interesting but stopped being interesting either through a change in its features or a change in the subject’s interests (for instance, I enjoyed watching a TV show that has changed to the point of not being of interest anymore, or there was a TV show I enjoyed as a kid but now is not interesting to me anymore).In these cases, there is something to do, be we don’t want to do it (anymore) because it is not interesting to us (anymore).
3. **Laziness** (in French, *paresse*) is a forward-looking tiredness that is expressed as a non-desire to start doing something (whether that activity is inherently interesting or not).

By defining these concepts as such, we can recognize a chronological progression to them: We’ve grown weary of X, as a result we’re bored of X and then we feel too lazy to do X. To apply this to all human activity in a post-human world, many people fear that with indefinite lifespans, we will grow weary of our activities, become bored with all of them and therefore become completely lazy.

⁸⁴American Heritage® Dictionary of the English Language, Fifth Edition.

2) Defining the fear

In order to expose and analyze the fear that an indefinitely long life would lead to a lack of interest, I will present this argument mainly along the lines already drawn out by Bernard Williams whose famous article⁸⁵ is perhaps one of the most clear and thought-provoking presentations of it. His reasoning goes like this: first, he posits that what gives life meaning is the pursuit of “categorical desires” – these are desires that are special in the sense that they go beyond simple survival and therefore can be thwarted by death – as opposed to “conditional desires.” What makes the former special is that “in the case of conditional desires, one has the desire in order that one may remain alive, whereas in the case of categorical desires, one desires to remain alive in order that the desire may be fulfilled.”⁸⁶ According to Williams, then, it is in the pursuit of categorical desires that we are motivated to achieve goals that make us want to stay alive - these can be our professional ambitions, our relational aspirations, our creative endeavors, etc. According to him, categorical desires are what makes life worth living and they are core to what makes us “us.” Williams then states a second premise: all of our desires, both conditional and categorical, are finite and exhaustible. As a result, in an endless life, there would necessarily come a time where we have achieved all of our categorical desires and there is nothing left to motivate us to do anything. As a result, everything would become terribly boring, our motivation would be gone and we would have no interest in living anymore.

Williams preempts the obvious challenge many people made to his argument: why couldn't we simply renew our categorical desires so that we continually have new projects motivating us into the future? Williams concedes that this may be possible, but claims this wouldn't be desirable: seeing as categorical desires are core to a person's meaning in life and whole identity, they are the defining features of a person's character, allowing them to define themselves through time, and so if they were to change, then the subjective person would necessarily be changed too. If the “me” of today met the “me” of 1000 years in the future at a time when all his categorical desires were different, then both “me's” would be so fundamentally different people that it wouldn't even be possible to say they were the same person anymore. As a result, changing a person's categorical desires would lead to a succession of different subjective identities, which would defeat the original purpose of living on indefinitely. Therefore, in Williams' eyes, an indefinitely long lifetime always leads to an undesirable dead-end: either our

⁸⁵ WILLIAMS, Bernard, « The Makropulos case: reflections on the tedium of immortality », pp. 82-100, dans *Problems of the Self, Philosophical Papers 1956–1972*, Cambridge University Press, 1973

⁸⁶ BURLEY, Mikel, « Immortality and Boredom: A Response to Wisniewski », *International Journal for Philosophy of Religion*, Vol. 65, No. 2 (Apr., 2009), pp. 77-85, p.79

categorical desires don't change in which case we will end up bored, or they do change, in which case our current subjective identity will have changed so much that it isn't us anymore.

I would like to first address Williams' second point on the succession of different subjective identities were we to change our categorical desires because, even though this isn't directly linked to the question of motivation, it can have an effect: indeed, if we are to believe that we would lose our identity by entirely changing our categorical desires, then perhaps we wouldn't feel motivated to pursue such radical changes out of fear of losing who we are. However, this fear seems to me to be quite unfounded, or rather, the way Williams presents it is misleading. Of course, if in 1000 years, everything that constitutes me – that is not only all the cells and neurons in my body, but all my desires and projects and tastes – is different to what it is now, then “present me” and “future me” will quite probably be two very different people. But directly confronting both of them like this is misleading because it doesn't account for the 1000 years of uninterrupted conscious life in between during which incremental changes were made. Imagine buying a house: you move in and feel at home, and over the years, now and again you change things, you buy new decorations, you move the furniture about, re-paint the walls, and sometimes even you do bigger works, you tear down a wall, change the floor, build an extension, re-tile the roof, etc. Eventually, 50 years down the road, there may be nothing left of the original house, and, if the original house were put beside it, both houses may very well be objectively different houses in every way, but you'll still have felt at home in the one you were living in when you were living in it. You never stopped feeling at home at any point.

This is why I think Bernard Williams' is wrong to claim that changing your categorical desires is undesirable: first of all it's not impossible that “present me” and “future me” (having changed all his categorical desires) would still be the same subjective person, because as long as “future me” has some memory of his past life all the way back to “present me”, then there's no greater rupture between them than there is between myself now and who I remember being when I was, say 7; which brings me to the bigger point: I don't particularly feel like “7-year-old-me” is me at all, and we're only 20 years apart. But it doesn't matter, because back then I felt like “me”, today I feel like “me”, and everywhere in between, I felt like “me.” So if “present me” and “future me” in a post-human world were so different that they didn't feel the same, it shouldn't really matter, so long as there is a continuous subjective experience linking the two. We therefore shouldn't be worried of “renewing ourselves” in the indefinitely long post-human lifetime.

Let's come back to Williams' first point: if we had infinite time to live, we would end up realizing all of our categorical desires and inevitably suffer from boredom (let's even assume, for argument's sake, that we have realized all possible categorical desires, even new ones, so there's

really no new categorical desire to pursue). Many authors seem to share his pessimism. For instance, novelist Susan Ertz's bemoans that "millions long for immortality who don't know what to do with themselves on a rainy Sunday afternoon"⁸⁷, echoing Douglas Adams's description of that rainy Sunday afternoon in a never-ending life:

"To begin with it was fun [...]. In the end, it was the Sunday afternoons he couldn't cope with, and that terrible listlessness which starts to set in at about 2:55, when you know that you've had all the baths you can usefully have that day, that however hard you stare at any given paragraph in the papers you will never actually read it, or use the revolutionary new pruning technique it describes, and that as you stare at the clock the hands will move relentlessly on to four o'clock, and you will enter the long dark teatime of the soul."⁸⁸

Sure, the idea of an endless boring day is not an attractive one. But is there reason to believe this is a credible portrayal of post-human life?

B – Analysis of the fear of boredom

Williams' premise that desires are finite and exhaustible seems exaggerated. In theory perhaps, in the grand scheme of the Universe, everything is indeed finite and exhaustible. But first of all, infinity can be born within a finite world. Mathematics is one example: we can conceivably keep counting forever until time stops. Is it so inconceivable that humans couldn't be source of infinitely renewable desires until the end of time?

To begin with, Williams seems to ignore the possibility for people to re-claim past categorical desires and pursue them anew.⁸⁹ After all, we may want to try things again and do them better. But this remains the least least satisfying answer to Williams' challenge, because a better prospect would be that by opening up our temporal horizon, we may discover an entirely new range of categorical desires that were simply not on the table before: if we had potentially endless amounts of time ahead of us, perhaps we would develop ambitions that cover much more time than they do today. These categorical desires wouldn't run out as easily because they would take infinitely more time to be satisfied. On a civilizational scale, new goals and projects can be developed, initiated, led and achieved by the same people gaining ever more experience

⁸⁷Citéedans CAVE, Steven, *Immortality: The Quest to Live Forever and How It Drives Civilization*, Crown; 1ère édition, 3 Avril 2012, 338 pages, p.172

⁸⁸ ADAMS, Douglas (1988-10-10). *The Long Dark Tea-Time of the Soul*. UK: Heinemann.

⁸⁹ WISNEWSKI, Jeremy, « Is the immortal life worth living? », *International Journal for Philosophy of Religion* (2005)

over centuries. This is a completely new and unexplored behavioral and conceptual territory for the human brain to explore and grow into.

But what's also striking is that Williams doesn't seem to believe that some desires could actually be eternally source of satisfaction. With unlimited time, Williams and others assume that inevitably, after doing everything several times, we'll grow tired of them. Stephen Cave agrees⁹⁰, doubting that we would have an unlimited passion for what life has to offer, believing instead that sooner or later, we'll grow tired of even the things that today we find attractive:

“We might love travel and dearly wish to live long enough to visit the thousand most beautiful or interesting places on earth, but we might be less inspired subsequently to visit the thousand slightly less beautiful and interesting places. Or the thousand after that. In the great scheme of infinity, it would not be long before we were left only with the thousand dullest places on the planet, at which point we might find our motivation seriously flagging.”⁹¹

Not only does he believe we'll get tired of all possible opportunities (i.e. that we would quantitatively exhaust all there is to do) but that even those that are the most pleasing to us would lose their charm after endless repetition (i.e. we would also qualitatively exhaust all there is to do):

“Of course, there are some pleasures we enjoy more than once. A good meal or conversation with friends or taking part in a favorite sport or hearing a favorite piece of music—these things seem at least as good the second, third or hundredth time. But a man who eats caviar every day will grow sick of it eventually, and we will one day— even if a million years hence—tire of all our friends' jokes.”⁹²

Peter Singer seems to agree that an indefinitely long life would lead to boredom for lack of novelty, citing Hans Jonas for whom “prolonged experience can never recapture the unique privilege of seeing the world for the first time with new eyes.”⁹³ And given that weariness comes from repetition, it is absolutely legitimate to think that with infinite time to do all possible

⁹⁰ *Op. Cit.*, CAVE (2012), p.231

⁹¹ *Id.* p.172

⁹² *Id.* p.172

⁹³ HANS JONAS dans SINGER, P. (1991). « Research into aging: should it be guided by the interests of present individuals, future individuals, or the species? », dans F.C. LUDWIG (ed.), *Life Span Extension: Consequences and Open Questions*, New York: Springer, 132-45., p.136

activities over and over again, we'd grow bored and eventually become completely lazy. But once again this fear rests upon a few unwarranted shortcuts. For instance, repetition doesn't always lead to boredom. Philosopher John Fischer from the University of California makes a distinction between «self-exhausting pleasures» and «repeatable pleasures», claiming that the world contains enough repeatable pleasures for us to always find some interest in our activities.⁹⁴ Similarly, philosopher and neuroscientist Neil Levy⁹⁵ claims that categorical desires can't really ever be exhausted, because their satisfaction relies on activities that are not themselves conceptually finite, such as creative pursuits. As we said earlier, even though the Universe may be finite, it can give birth to sources of infinities, such as mathematics and, perhaps, imagination, creativity and our interest in other activities.

But more importantly, this fear actually is counterproductive: the best way to prevent repetition from leading to weariness and then to boredom and laziness, is precisely to have *more* time on our hands. Indeed, as philosopher Christopher Wareham⁹⁶ from the University of Johannesburg points out, most of our activities don't lose their inherent value through repetition. For instance, when I play football, or when I read a book, or when I play video games, I may at some point get weary of the activity and start losing interest. But this loss of interest isn't due to a repetition of the activity (I may have played football 1000 times before in my life, this hasn't diminished my pleasure of playing), instead it is due to my engagement with it for too long or too regularly. If I get bored with a video game, I'll stop playing for a while, enough time for my interest to regenerate so that when I play again, I'm just as pleased as I was the last time I started playing. It's the same with everything else and therefore the answer to weariness and boredom with regards to activities that are inherently interesting is not less time but more time, because this means more time to take "breaks" from doing the things we enjoy so that our interest can be teased and maintained over time. Furthermore, let's not forget that many activities get more and more enjoyable over time precisely through repetition: music, for instance, requires great practice and rehearsing, to perfect our skill and thus get more satisfaction from the activity.

As such, claiming that terminal boredom is an unavoidable consequence of having potentially infinite time seems to be not only misguided but also terribly pessimistic about people's ability to find new interests. In the amount of time it would take me to visit a few times all of the interesting places in the world today, a civilization would have the time to appear and disappear somewhere and leave behind it some lost city I'll want to go and visit. Wisniewski gives

⁹⁴FISCHER, John Martin, *The Metaphysics of Death*, Stanford, CA: Stanford University Press, 1993

⁹⁵N. LEVY, 'Downshifting and Meaning of Life', *Ratio* XVIII (2005), pp. 176–189, at pp. 184–185.

⁹⁶WAREHAM, Christopher, « Life extension and mental aging », *Philosophical Papers*, volume 41, Issue 3, 2012, pp.455-477, p.466

the example⁹⁷ of a person wishing to be the best possible musician: after learning how to be a master at playing all existing instruments, he may have exhausted his categorical desire, but the invention of a new instrument, for instance, could breed new life into it.

Meanwhile, the fact that boredom could loom down the road could turn out to be a good thing, insofar as the threat of boredom would be a motivating factor pushing people precisely to act so as to avoid it. Perhaps boredom is a useful negative state, just like sadness: something that we don't seek but that can happen to us, and when it does, it not only motivates us to seek more positive situations but also helps us appreciate the better times. Indeed studies show that we are driven by an innate curiosity that pushes us to go and be active, noting that some human (and animal) activities don't seem to be justified by any other reward than the engagement in the activity itself. We have a natural thirst for entertainment: for psychologist Daniel Berlyne⁹⁸ our organism is continuously driven to maintain an "optimal influx of arousal potential." As such we would be motivated to pursue any activity that can maintain this optimal level of activation/excitation/attention: if the stimulation level is too high, we will reduce our exposure to the activity; if the level is too low, we will seek out activities that will provide greater stimulation. Berlyne further claims that boredom "is reduced by entertaining exploration and [reinforced] when the external stimuli are insufficient or excessively monotonous."⁹⁹ He claims that boredom is a factor that feeds into our motivational drives, such as the "drive to explore" that would underlie our adventurous urges and a "drive to know" that would feed our curiosity and thirst for knowledge. Litman & Spielberger¹⁰⁰ confirm this, defining curiosity as a desire to acquire new knowledge and experience that will explain exploratory behavior. According to them, entertaining exploration is motivated by the feeling of boredom and the desire to vary stimulations. As such, boredom wouldn't be a terminal state, as many seem to fear. On the contrary, boredom is itself a state that pushes us to avoid it or extract oneself from it, in the same way that hunger pushes to find food. Boredom, in a way, may become the new death, a "stealth motivator" driving our new primary goal: living rich, interesting lives. Bored people may be the equivalent of "living dead" – people's whose ailing interest in life we would not want to catch, people we would want to help. Some people claim that this state of boredom would be so unbearable as to be worse than death. I find this argument quite insulting to dead people. Bored people can find interests, and people around them can help them like today we help depressed people. What if some people can't be lifted out of boredom? Well, barring neurological interventions to help them overcome boredom,

⁹⁷ J. WISNEWSKI, 'Is the Immortal Life worth Living?', *International Journal for Philosophy of Religion* 58 (2005), pp. 27–36.

⁹⁸ Berlyne, D. E., *Conflict, Arousal, and Curiosity*. New York : McGraw Hill, 1960

⁹⁹ BERLYNE, D. E., *Conflict, Arousal, and Curiosity*. New York : McGraw Hill, 1960, p.187

¹⁰⁰ LITMAN, J. A., & SPIELBERGER, C. D. (2003). "Measuring epistemic curiosity and its diverse and specific components" *Journal of Personality Assessment*, 80, 75–86

perhaps some form of natural selection will occur, where those unable to adapt to a longer lifespan will die out, and the ability to stay interested in life will be a strong evolutionary selector. Philosopher John Harris claims for his part that this fear of boredom under-estimates humankind's resourcefulness:

“only the terminally boring are in danger of being terminally bored, and perhaps they do not deserve indefinite life. Those who are bored can, thanks to their vulnerability, opt out at any time. But those of us who do not have terminal failure of the imagination should be left to create new ways of enjoying life and doing good.”¹⁰¹

All that being said, let's follow Williams' argument to the end and suppose that in this post-human world, we find a balance between cautiousness and risk-taking, we don't get killed by some freak accident, we do go on to do all there is to do, enough times so that we are bored with everything, even the new things that have appeared along the way. Supposing that is truly the end point of the post-human life, should we believe that this is a life not worth pursuing in lieu of the one we currently have? By utilitarian standards, we most certainly should pursue it. If I visit the Taj Mahal 20 times and that only my first 5 visits were interesting to me, isn't it better to have had 5 interesting visits of the Taj Mahal than only one or none at all? Let's say that life X is life as we know it today. At the end of it, let's say I have visited 5% of all the places in the world I would have liked to visit; I'm entirely satisfied with my different trips, and I feel a bit of sadness and frustration that I couldn't visit the other 95% of places I would have liked to see. But I never grew tired of my travels, never got bored of the places I visited, I'm quite content with my life and I will die with 100% satisfaction for the 5% of my desired journeys. Now let's compare that to life Y in the post-human condition: here I have had time to visit 100% of the places I wanted to visit, each one 20 times. And let's say this is the amount of times it has taken me to get completely bored of them all, and no new location has appeared for me to discover. In every case, the first 5 visits were all wonderful for various reasons (discovering for the first time, rediscovering under different circumstances, seeing and learning new things, having a different travelling approach, etc.). So even though beyond the first 5 visits, my interest diminished every time a little more to the point of reaching absolute boredom, I still enjoyed 5 interesting visits. Each one of these locations will have provided me with 5 moments of happiness. So even if at the end of an infinite life, I have a 0% satisfaction for 100% of the places I could go and visit, I

¹⁰¹HARRIS, John, *Enhancing Evolution: The Ethical Case for Making Better People*, Princeton University Press, 17 octobre 2010, 242 pages, p.64

will still, at some point, have experienced 100% satisfaction from 100% of all possible places to visit.

By the way, I'm not saying here that "more" necessarily means "better", but it depends what we're talking about. What I am saying is that "even more good things" is better than "more good things" which is even better than "a few good things." And it seems quite clear to me that life Y, at least at one point in that life before boredom starts clouding our appreciation, is clearly preferable to life X. Those who still think otherwise should consider the following: if life Y actually happened and became the norm, would they want to take steps to roll things back towards life X? I doubt it.

I'm not trying here to underappreciate the very serious threat of boredom. I too believe that if we were to all become miserably bored of the possibilities of the world, it would be tragic. But given what we understand about human psychology as it related to the spectrum between boredom and interest, it would be a hugely conservative error to oppose the pursuit of the post-human condition on these grounds. First of all, research on the psychological bearings of boredom tends to invalidate this claim that complete boredom awaits us all in the post-human future. Psychologists Bortolotti et Nagasawa¹⁰² make a distinction between two types of boredom: first there's situational boredom¹⁰³ which is caused by insufficient stimulation or repetition and that typically occurs when a person is bored specifically with something. And then there is habitual or chronic boredom¹⁰⁴ that is a personal dissatisfaction and a general lack of engagement with life; here the person isn't bored by a specific thing or activity but by life in general. Chronic boredom therefore is more akin to a mental health issue such as depression than it is a result of our motivational engagement with the activities of life. People who fear boredom in the post-human world conflate both types: they think that as a result of activity, they will become chronically bored. But this doesn't make much sense – they will get chronically bored with life if, through the events in their life and their own mental health, they become disengaged with life and, for instance, suffer from depression. And those people will need help either way to find interest in life. The kind of boredom people are more likely to experience in the post-human world is situational boredom, which as we said before will become a motivator in its own right, pushing people to avoid and find new interests. Indeed, empirical research on people suffering from chronic boredom shows that their condition isn't caused by environmental factors like the activities that are available to them (or lack thereof), but by their character and mental health

¹⁰²BORTOLOTTI, Lisa, et NAGASAWA, Yujin, *Immortality without boredom*, Journal compilation, Blackwell Publishing Ltd, 3 September 2009, p.268

¹⁰³R. BARGDILL, 'The Study of Life Boredom', *Journal of Phenomenological Psychology* 31 (2000), pp. 188–219R.

¹⁰⁴J. EASTWOOD, C. CAVALIERE, S. FAHLMAN, and A. EASTWOOD, 'A Desire for Desires: Boredom and its Relation to Alexithymia', *Personality and Individual Differences* 42 (2007), pp. 1035–1045.

issues. According to Greenson,¹⁰⁵ chronic boredom is caused by an “inhibition of fantasy”, while Brenstein¹⁰⁶ claims that it results more generally from a lack of emotional intelligence.¹⁰⁷ This all tends to show that boredom would become the new prime mental ailment of the post-human world, as fantasy and emotional intelligence would be two of the main psychological strengths one would want to have to enjoy it.

But more importantly still, supposing this state of absolute boredom is a necessary final destination at the end of the road of experience, it would seem that this road is so long and the destination so far away (just imagine: you need to have done *all* that is possible *enough times* over for everything to bore you) that the required time to get there would be truly infinite. So not only is there a good chance we’ll die in some freak accident at some point in our hundreds or thousands of years before we ever get too bored, but if we do make it to that stage of terminal boredom, is that reason enough to not want to travel all the way down the road of experience? Today already, we know what kind of suffering can await us in old age, but does that mean we want to die before that? No. We don’t look forward to it, we try our best to mitigate how bad those days will be and when they’re here we sometimes help those who can’t stand it to move on a bit quicker. If absolute boredom awaited us at the end of the road, the answer shouldn’t be stop half-way, but rather to try to address the problem that awaits us.

How? As always, innovation, exploration, creation. Critics can always say that even new interest will eventually get boring, to which you can always reply that people will again find new interest - and the debate as to whether boredom will put an end to innovation or innovation will always be one step ahead of boredom can go on until it bores us to death. But in truth, there is a way to show that innovation will always win the day: if A represents all the possible activities in the world at a given moment T, and that, in theory, a person P can realize A, then we could say (as Williams does) that P can get bored of A. But what Williams omits is that the world is constantly changing, other people are engaging in activities thus constantly changing them and creating new ones so while P is engaged in one activity (let’s say the last activity that was of some interest to him before he became fully bored with A), a new activity, somewhere else, will have appeared. In other words, seeing as A is constantly changing, P can’t ever be bored with A, because he cannot ever have done A. This terminal boredom is therefore impossible because in reality it is impossible for a person to have done everything that it is possible to do at any given time. New possibilities (and therefore new sources of interest) will be available to people whether they create them or not.

¹⁰⁵R. GREENSON, ‘On Boredom’, *Journal of the American Psychoanalytic Association* 1 (1953), pp. 7–21

¹⁰⁶H. BERNSTEIN, ‘Boredom and the Ready Made Life’, *Sociological Research* 42 (1975), pp. 512–537

¹⁰⁷J. EASTWOOD, et al., ‘A Desire for Desires’, p. 1037

However, a lack of interest, or a lack of engagement, could legitimately come as the result of something we simply cannot predict: mental exhaustion. Perhaps after a while, even though there are still many things we could be interested in, we will just feel like we've had enough. We can already observe similar psychological traits today. Oftentimes, younger people are unbridled by the weight of experience and seem to have endless energy and willingness to thrust themselves into the experiences of life – travels, studies, jobs, relationships, etc. – but after a while, the efforts and disappointments sometimes wear people's energy down to the point where the lust for life doesn't rekindle as much. People who've "been around the block" report being too tired to go again. It's quite possible this exhaustion is the result of our limited lifetime, whereby people reach a point in life where they judge they'd rather pursue safer projects. But this question of mental energy in an indefinitely long healthy life is something we just cannot predict. Even today you have people who seem mentally tired by the time they're 45 and others in their 80s whose lively minds are trapped in uncooperative bodies. Maybe after "only" 300 years of full life, we'll all hit a wall of mental exhaustion beyond which we just can't muster the strength to go on. Some may struggle through it and find a second wind, like runners in a marathon. These are realms of experience we just cannot predict. But one thing is for sure: the potential risk of such a mental exhaustion is not reason enough to not pursue radical life extension. It's just a hazard worth keeping our eyes out for as we proceed into the centuries.

There are a few more considerations that make me believe this fear of a loss of interest is overblown. First of all, perhaps it has less to do with the amount of time we have and more to do with the amount of time we expect to have. Consider the following analogy: suppose you get on a plane for a short 1-hour flight and when you land, the pilot says that you're now going to take off again and you're going to go back and forth another 14 times. This sounds horrible and you'll already be bored with the whole ordeal before the plane takes off for the second time. But suppose you get on a long-haul flight that takes 15 hours to get to your destination, after about one hour you're not bored with the flight yet, you're still getting settled in, checking out what's on the in-flight entertainment center, sipping on your complementary cocktail. In this sense, if you're expecting to live a much longer life, you won't get bored. This is perhaps why older people are often the least interested in radical life extension, because they've been preparing for their plane to land soon. If we were born in the post-human world, our motivation would be adapted to that kind of temporal space. The only real problem is with us, the humans of today who would have to transition into the post-human world with our existing psychological baggage and either adapt or die out. Thankfully, it seems unlikely that this post-human world will happen overnight, and so people will presumably have some time to evolve.

Finally, if boredom was a final destination, some may conceive of means to combat boredom and the source, by influencing its neuronal correlates. Temkin notices that “if we can solve the problem of immortality, surely we can solve the problem of boredom.”¹⁰⁸ For this, we could artificially boost people’s curiosity or create selective memory pills to make us forget some past experiences in order to rediscover them anew. Obviously this kind of solution raises massive ethical questions about our relationship to reality and leading an authentic life (think of Nozick’s experience machine). Given the immensity of what’s at stake here (life or death), I suppose the answer would have to come down to each individual’s own choice: some will artificially fight their boredom, others won’t, and it would seem unfair for either side to prevent the other from leading a life they are happy with.

¹⁰⁸TEMKIN, Larry, « Is living longer living better ? », *Journal of Applied Philosophy*, Vol. 25, No. 3, 2008, p.204

CONCLUSION

My goal with this paper was to investigate the following question: is there good reason to believe that in a post-human world where we would have an indefinitely long healthy life, we would lose our motivation to act?

After diving into the research, I'm left with a contrasted feeling: on the one hand, I'm far more aware of the potential danger with regards to motivation that awaits us in the post-human world. Of all the arguments examined, two give me more reason for caution: the first is the relationship between biological needs and social desires. If social desires all find root in biological needs directed at survival, then with a weakened threat of death, will the whole human edifice collapse – or instead, will something else emerge from it, a new environment in which conscious subjectivity finds a new form of existence that isn't predicated on biological needs, or even living organisms for that matter? The second biggest danger in my view is the very real and unpredictable possibility of a mental exhaustion.

At the same time, given all the research on human motivation, I believe I can stand by my original intuition: in the post-human world, we may lose some purpose, some pressure and some interest but not sufficiently so to fear any kind of standstill, and more importantly, in every case there are strong reasons to believe that people can adapt to find newer and perhaps better kinds of purpose, pressure and interest. First of all, our actions won't be guided by unrelated and uncertain quests for immortality, but by a focused desire to preserve life and enhance its quality. The primary goal in life won't be to survive, but to live as well as possible. Second, our actions won't be performed under pressure, coerced into compromise and renouncement, but driven solely by our own will, freed and empowered. This post-human life will free us from what are today choice limitations and so the standstill some people fear today doesn't result from an absence of temporal pressure, but from the pressure that comes with being forced to choose. Indeed, we'll be freed of one kind of pressure (having to act before the time's up), but will present a new kind of pressure: being able to evaluate option, make good decisions and learn how to enjoy them. Finally, if some things that are of interest today ceased to be in the post-human world, we would find new sources of interests, including some that simply couldn't exist in the restricted timescales of the current condition, and that would develop only once our temporal horizon was broadened.

Old age is tragically cruel because just when people acquire the wisdom of a long and rich life experience, they lose the means to apply it, spread it and grow it further. As such, a civilization made of old minds in young bodies would surely be “full of life.”

What would that be like? It isn't exactly true to say that we have no model for what humans would be like if they had a potentially infinite lifetime ahead of them. We just need to look at the humans of today who are the least aware or preoccupied by their own mortality: children. How are we to explain that it is at an age in life where old age and death are the most removed from our minds, where time truly feels infinite ahead of us, that we are the most curious and playful and adventurous? People grow tired as soon as time and deadlines becomes limitations. By liberating adults from the pressure of time, humanity will be able to grow up and fulfill its potential.

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ADDENDUM

		We don't want to	We want to	Feeling towards the deadline	Feeling towards situation A	Feeling towards situation B	Strategy in preparation for B
FEELING WITH REGARDS TO THE DEADLINE	Balance in favor of A.	Loose the good things of A	Keep the good things of A	Dread/anxiety → desire to push the deadline back	Opportunity	Threat	Urgency
		Suffer the bad things of B	Avoid the bad things of B				
	Balance in favor of B.	Continue suffering the bad things of A	Get rid of the bag things of A	Hurry/impatience → desire to move the deadline forward	Resignation	Envy	Patience
		Miss out on the good things of B	Gain the good things of B				